

Review on Etymological History of Exotic Cultured and Aquarium Fishes of Bangladesh

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Abstract - Commercially important 14 cultured and most popular 14 aquarium exotic fish and their scientific names have been illustrated in this review paper. Although aquarium owners keep many other ornamental fishes into their hobbies in Bangladesh. But most of them are close relatives or varieties or strains of the discussed aquarium species. For this, it would not be a problem for a person to identify them who is properly acquainted with these 14 species. Being exotic fishes their origin and distributions have been discussed. Scientific name explanations and the account of geographical locations will help to draw outstanding features of the concerned fish species. Fisheries scientists will find very useful information from this paper.

Keywords - Bangladesh; Exotic Fishes; Aquarium Fishes; Etymological History.

I. INTRODUCTION

Exotic fishes are alien to a destined locality, having a strange or bizarre look, beauty, or quality, introduced from foreign countries or from different geographical location to a new environment as a means of incurring some benefit ([1], [2], [3]). The most common motivation for introducing a species into a new place is that of economic gain. For example exotic fish species introduced into Bangladesh for the purposes of benefit in aquaculture or total fish production enhancement or other economic activities are prominent. Introductions have also been important in supporting recreation activities or otherwise increasing human enjoyment ([4], [5], [6], [7]). Numerous aquarium exotic fishes have been introduced in Bangladesh with the intent of aesthetically improving human recreation through ornamental fish keeping ([4], [8], [9], [10]). Intentional introductions have also been undertaken with the aim of ameliorating environmental problems ([5], [11]). The purpose of this paper was to review the history and recent progress in scientific name background of cultured and

aquarium exotic fishes introduced in Bangladesh. Being exotic fishes, geographical distribution and some exclusive features of the fishes have been discussed. The ultimate objective of the study was to create a platform for the readers and students so that they could get an idea about the exotic fishes and make acquaintance with them.

II. METHODOLOGY

Data and information incorporated into this paper were synthesized from different online dictionaries, websites, books and published scientific papers retrieved during this work, within 2017. Relevant background information was collected through a literature survey. The exotic species which were often found in the local markets of different upazilas and districts of Bangladesh were considered for the study. Aquarium fish information was collected from different aquarium shops of Barisal, Dhaka, Jessore and Rajshahi. A questionnaire was also used to accumulate additional information from fish traders, farm owners, fish keepers and specialists on related field having face to face

interviews for both the cultured and aquarium fishes. All the reviewed sources were cited in the bibliography.

III. EXOTIC CULTURED FISHES OF BANGLADESH

***Cyprinus carpio* var. *communis* (Linnaeus, 1758):** It is better known as common carp or scale carp (with regular concentric scales). Latin *cyprinus* refers to carp [12], would have been derived from Greek Kypris Aphrodite, Goddess of Love, because of its fecundity, and Latin *carpio*, carp (a freshwater teleost food fish, typically *Cyprinus carpio*, having a body covered with cycloid scales, a naked head, one long dorsal fin, and two barbels on each side of the mouth [13]). The word carp occasionally used for fishes that eat a lots of various dirty and rotten things of plant origin [14]. Latin *communis* may refer to common or general [12]. The common carp or European carp (*Cyprinus carpio*) is a widespread freshwater fish of eutrophic waters (enriched with nutrients) in lakes and large rivers in Europe and Asia [15]. The native wild populations are considered vulnerable to extinction by the IUCN (International Union for Conservation of Nature), but the species has also been successfully cultivated and introduced into environments worldwide, and is often considered a destructive invasive (not native to a particular area) species [1]. The common carp originated in European rivers around the Black Sea and the Aegean basin, especially the Danube. Prior to human influence the common carp was found in the Black, Caspian and Aral Sea drainages, east into Siberia and China and west as far as the Danube river [14].

***Cyprinus carpio* var. *coriaceous*:** It is better known as leather carp (with few or no scales on the back and a thick skin), usually belong to the *Cyprinus carpio*'s nominated subspecies *C. c. coriaceous*. Synonym of *coriaceous* means having or resembling the texture of leather [13].

***Cyprinus carpio* var. *specularis*:** The word specular pertaining to or having the properties of a mirror [13]. It is better known as mirror carp (large scales running along the sides of the body in several rows leaving rest of the body naked) usually belong to the *Cyprinus carpio*'s nominated subspecies *C. c. specularis*. Mirror carps are a type of fish commonly found in Europe. The name mirror carp originates from their scales' resemblance to mirrors.

***Ctenopharyngodon idella* (Valenciennes, 1844):** Gk. kteis or ktenos means comb, pharynx means gullet & throat, and odon means teeth [12] (in reference to its comb like pharyngeal teeth; and *idella*: presumably derived from the Gk. idios, distinctive or peculiar dentition. It is commonly known as grass carp. It is a large herbivorous freshwater

fish species of the family Cyprinidae native to eastern Asia, with a native range from northern Vietnam to the Amur River on the Siberia-China border [16]. This Asian carp (*C. idella*) is the sole species of the genus *Ctenopharyngodon*. It is popular in China as food fish, but was introduced in Europe and the United States for aquatic weed control. It is a fish of large, turbid rivers and associated floodplain lakes, with a wide range of temperature tolerance [16]. It is still stocked in many countries as an effective biocontrol for undesirable aquatic vegetation. Grass carp required long rivers for the survival of the eggs and juvenile fish.

***Hypophthalmichthys molitrix* (Valenciennes, 1844):** Gk. hypo refers as directed to lower position; ophthalmos refers to eye; and ichthys means fish [12]; indicates the position of eyes of the fish that project downwards on the head; and *molitrix* denotes approximately grinder [17] (refers to the pharyngeal grinding apparatus), i.e., the specialized feeding apparatus capable of filtering particles as small as four μm . A strong buccal pump forces water through this filter. The gill rakers of the fish are fused into a sponge-like filter, and epibranchial organ secretes mucus which assists passive consumption by trapping small particles [2]. It is better known as the silver carp or to many anglers the garbage fish. As the fish feed on phytoplankton, often cultured by many farmers for controlling water quality, especially in the control of noxious blue-green algae [2] (cyanobacteria, *Microcystis* etc.). As the name implies, silver carp are silver colored with white bellies. The silver carp (*H. molitrix*) is a species of freshwater cyprinid fish, a variety of Asian carp native to China and eastern Siberia [3].

***Hypophthalmichthys nobilis* (Recharadson, 1845):** It is often called *Aristichthys nobilis*. Nobility means quality of being excellent or rare, from Old French nobilite means high rank; dignity [12]. *H. nobilis* ranks high upon *H. molitrix* in reference to their length, weight and skull structure; Silver carp may grow to longer than 3 feet and weigh up to 60 pounds [3], while bighead carp (*H. nobilis*) are even larger up to 5 feet long, weighing up to 90 pounds [18]. It more commonly known as bighead carp for larger skull structure, can be found all across the world. Bighead carp are commonly found in parts of Asia, Europe, and Northern America [18]. Adult bighead carp can be distinguished from silver carp by their dark gray skin with dark blotches [19].

***Mylopharyngodon piceus* (Recharadson, 1846):** The black carp or black Chinese roach (a fish with little flap at its mouth end [14]) is a species of cyprinid fish and the single species of the genus *Mylopharyngodon*. It is native to lakes

and rivers in East Asia ranging from the Amur basin, through China, to Vietnam [20]. The word *mylo* comes from the Gk. word for molar and *pharynx* means gullet, *odon* means teeth [12]. So, *Mylopharyngodon* denotes fish with pharyngeal molar teeth. Latin *piceus* means black or dark [12]. The specific epithet *piceus* denotes dark upper part of the fish body.

***Puntius gonionotus* (Bleeker, 1850):** Latin *punctum* means point, the point of the sword [12], probably refers to the pointed snout or pointed dorsal spine of the fish. Ancient Gk. word *gonio* means angle, and *noton* means back [12]; denotes the arched (elbow shape) lateral view of the fish's dorsal part. The fish, also called *Barbonymus gonionotus*, more commonly known as silver barb or Java barb, is a species of ray-finned fish in the genus *Barbonymus*. The silver barb, one of the five most important cultured freshwater species in Thailand, can be farmed with low technology and relatively less effort than other species. The silver barb, for being a short-cycle species, became popular as commercial farmed fish in Bangladesh where it is known as Thai sharputi [21].

***Anabas testudineus*, Thai koi (Bloch, 1792):** A sub-species of climbing perch have much similarity with the native koi of Bangladesh. Number of dorsal and anal spines, opercular black spot, and black spot on caudal peduncle are all the same. Both koi have opercular scales. But girth area of Thai koi is much broader than native koi. The mandible of native koi is somewhat anastomised (directed upward), where Thai koi have mouth pointed as spindle. Operculum of native koi is decorated with long polar spines when that of Thai koi is decorated with short spines. Latin *Anabas* denotes to climb up [12], indicates the fish have ability to climb up out of ponds to reach a new habitat. Genus name *Anabas* would have been taken so because the fish have to migrate to the water surface periodically to take a breath. The origin of species name is uncertain, probably derived from the Latin word *testudineum* refers to tortoise [22]; probably the snout, as it has the resemblance with that of *Anabas*. The native koi have reddish brown tinge to the belly and ventral fins when fully grown, whereas Thai koi have only bright brownish tinge. The koi (*Anabas testudineus*) naturally occurs in Bangladesh, India, Pakistan, Myanmar, Sri Lanka, Thailand, Cochin-China, Tongking, Philippines, Southern China, Polynesia and Malaysia [23].

***Oreochromis niloticus* (Linnaeus, 1758):** Latin *aurum* means gold and Gk. *khroma* and French *chrome* means colour [12], *Oreochromis* means a fish, perhaps a perch with gilded color mark. The fish, commonly known as nilotica,

belongs to the order Perciformes (Acanthopteri, an edible freshwater fish with a high spiny dorsal fin [12]), is an important food fish of the Nile and other rivers of Africa and Asia Minor. The specific epithet *niloticus* is related to the river Nile [22]. Nilotica- a perch like freshwater fish in the family Cichlidae (Cichlid from Gk. *chelidon*; swallow fish, i.e., mouth brooders [13], they carry the fertilized eggs and young fish in their mouths for several days after the yolk sac is absorbed, is widely distributed in many tropical countries [24]. The Nile tilapia, a cichlid fish, including Bangladesh, also provides a valuable source of food in some areas of South East Asia, though native to Africa [24].

***Oreochromis mossambicus* (Peters, 1852):** Previously known as *Tilapia mossambicus*. The word tilapia- a latinization of the Tswana word *tlhapi*, *thiape* (fish), is an edible fish of the genus *Tilapia*, native to Africa and Middle East, but successfully cultured worldwide [25]. In Arabic the fish is called *Musht*, which means a comb, as resembled by its backfin. The specific epithet *mossambica* describes the geographic area, Mozambique, to which the species is native [26]. The fish turns out to have a shekel (silver) coin in its mouth. It is commonly called black tilapia in Colombia [27]. The common name tilapia hails from the name of the cichlids (mouth brooders) genus *Tilapia*. This genus used to be much bigger, but it has now been split into several different genera, e.g. *Oreochromis* and *Sarotherodon*. It is, however, still common to refer to the old members of the genus *Tilapia* as tilapias in everyday speech [28].

***Clarias gariepinus* (Burcell, 1822):** Gk. *chlaros* means lively [12], refers to the ability of the fish to survive for a long time out of water without debility. *Gariepinus*: named after its type locality, the Gariep River-huge for distribution [29], the Hotentot name for the Oranje River, South Africa. The specific epithet *gariepinus* probably was taken so because of huge muscle mass of the fish concern. *Clarias gariepinus* has all the qualities of an aggressive and successful invasive species. Its high fecundity, flexible phenotype, rapid growth, wide habitat preferences, tolerance to extreme water conditions and the ability to subsist on a wide variety of prey can devastate indigenous fish and aquatic invertebrate populations [30]. It is because of these characteristics the countries such as India have imposed a ban on the introduction and culture of *C. gariepinus* [11]. Nevertheless, the effects of the illegal and indiscriminate introduction of this fish into India, as in other countries, have brought about potential ecological problems such as the loss of biodiversity in natural inland waters [31]. Genetic introgression of native wild clariid catfish by escapees of

hybrid catfish (*C. gariepinus* x *C. macrocephalus*) from fish farms have been reported in Thailand [32]. It is because of these embedded problems with this clariid catfish Bangladesh Government has imposed a ban on introduction and culture of *C. gariepinus*.

***Pangasius sutchi* (Fowler, 1937):** The word pangus refers to legend, king, and master of all [14]. *Pangasius* is a genus of medium-large to very large shark catfishes native to freshwater in South and Southeast Asia [33]. The term pangasius most probably taken after its very large body shape among freshwater catfishes, which resembles the panga boat, upper part spacious and lower half part compressed laterally. The word sutchi denotes deep purple color fins of juvenile pangus. It is better known as iridescent sharks as its body shape resembles that of a shark and has shiny iridescent color [33]. The iridescent shark *Pangasianodon hypophthalmus* previously known as *Pangasius hypophthalmus* (Sauvage, 1878), is a very active catfish. They are school forming fish, and a group of these swimmers makes a delightful display. *Pangasianodon*: Pangasius-Vietnamese name of a fish; Gk. prefix for without and odon for teeth [12]; in reference to the toothless state of the adult fish. *Hypophthalmus*: denotes downward position of the eyes on the head [12].

***Pygocentrus nattereri* (Kner, 1858):** *Pygocentrus*: from the Ancient Gk. puge, means rump, and kentron, means sharp point, spine, in reference to the serrated abdomen in genus members [34]. The species *nattereri*: named for Austrian naturalist Johann Natterer [34] (1787-1843) and known as piranha. This red-bellied piranha, also known as the red piranha, is a species of piranha native to South America, found in white water rivers like the Amazon river basin, coastal rivers of northeastern Brazil [35]. The red-bellied piranha is supposed to be highly carnivorous, but they are actually omnivorous. They are popular aquarium fish. As their name suggests, red-bellied piranhas have a reddish tinge to the belly when fully grown, although juveniles are a silver color with darker spots. Red-bellied piranha shows negative consequences for the local fish fauna when introduced into a new environment due to its aggressive behaviors, such as biting, chasing, nonspecific confrontation, and fighting. Bangladesh Government has imposed a ban on introduction and culture of piranha *P. nattereri* for its bad reputation.

IV. EXOTIC AQUARIUM FISHES OF BANGLADESH

***Gymnochorimbus ternetzi* (Boulenger, 1895):** Gk. gymnos means naked, and korymb means summit [36]; *Gymnochorimbus*- presumably refers to scaleless humped

predorsal profile. The specific epithet *ternetzi*: named for Dr. Carl Ternetz. Black skirt tetra is native to Bolivia, Brazil and northern Argentina. It is popularly known as skirt tetra, black skirt tetra, high-fin skirt tetra, petticoat tetra. Tetra is short for Tetragonopterus, a genus name formerly applied to many of these fish, which is Gk. tetra for square-finned [37] (literally, four-sided-wing) refers to the square position of dorsal, adipose, pelvic and anal fin. These four fins lead to the name tetra [4] and the fish's very high anal fin leads to the name skirt for it resembles lower half part of skirt. Closely related synonym is *G. megalopterus*. The specific epithet *megalopterus*, taken from mega means large and pteron means fin [12], refers to the very high and long anal fin, might be more appropriate for skirt tetra.

***Metynnis hypsauchen* (Muller & Troschel, 1844):** Gk. Meta means with, after; ynnis, -eos means ploughshare [36]. Ploughshare refers to a sharp steel wedge that cuts to loose the top layer of soil [13]. The word hypso means height, high; sauchen means to bend like bow [12]. The specific epithet *hypsauchen* refers to arched dorsal part of the fish. This species and its close relative *Metynnis argenteus* are both known as silver dollar. The silver dollar originates from South America in the Amazon and Orinoco river basins [38]. *Metynnis argenteus* looks just as its name implies- round outline resembling a dollar and silvery as ploughshare. The body is silver, but develops spots below the surface [38]. The scientific name says it all: the genus term *Metynnis* means with plowshare and the species name *argenteus* means covered with silver [22]. These fish are virtually identical in both looks and aquarium care, and both are commonly available [39]. The two species can only be distinguished by the black blotch or shoulder patch found slightly above and behind each eye on the *M. hypsauchen* [39]. Moreover, *M. hypsauchen* has a lightly pigmented lateral line.

***Chromobotia macracanthus* (Bleeker, 1852):** The genus *Chromobotia* derives its name from the Gk. word *chromo* means colour [12], refers to the fish's bright colors and stripes (many tropical fish with stripes that stand out are commonly called clown) as well as from its habit of entertaining aquarium owners with strange habits, such as swimming upside down, or playing dead [8]. The regional Asian word *botia*, derived from the word *boti* which refers to someone who looks strong on the outside but actually bitch in the inside [14], means warrior or soldier; describes the teasing nature (to make mate-fish annoyed) of the fish. It is a pity the loach is so delicate, it shows signs of exhaustion sooner than any fish in the collection (The book of the Aquarium and Water Cabinet by Shirley Hibberd). The

specific epithet *macracanthus* is derived from the Gk. word *macro* means large and the Latin word *acanthus* means thorny [12] refers to the large spines or prickles beneath the eyes of the fish. Clown loaches are native to the islands of Sumatra and Borneo in Indonesia including Malay Archipelago [8].

***Carassius auratus* (Linnaeus, 1758):** Latinization of *karass* that describes European reddish brown to olive green crucian carp [12]. Gk. *auratus* means gilded, pertains to the golden body color of the fish [12]. That is small golden or orange-red freshwater fishes of Eurasia used as pond or aquarium fishes are commonly called *carassius*. It is one of the most commonly kept aquarium fish [40]. Goldfish is native to East Asia. Goldfish breeds vary greatly in size, body shape, fin configuration and colouration [40] (various combinations of white, yellow, orange, red, brown, and black are known).

***Poecilia reticulata* (Peters, 1859):** The word *poecile* means painted with a lot of colours [13]. So it is known as rainbow fish, commonly called guppy. Females are grey in color, but males have splashes or spots of a wide variety of colors [5]. The specific epithet *reticulata* refers to the net-like (reticulated) texture of veins on the leaves [13], here pertaining to the reticulation pattern of the fish caudal fin. *Poecilia reticulata* is very small in size (3-6 cm), but most popular as an aquarium fish and widely distributed in tropical regions of the world [5]. Guppies are native to Antigua and Barbuda, Barbados, Brazil, Guyana, Jamaica, the Netherlands Antilles, Trinidad and Tobago, the U.S. Virgin Islands, and Venezuela [5].

***Poecilia sphenops* (Valenciennes, 1846):** Gk. *sphen* refers to wedge and *opsis* means appearance, likeness [12]. Wedge means material having one thick end and tapering to a thin edge [13] (like horsetail), refers to the attenuated caudal fin of the species *sphenops*. It is commonly known as molly or sometimes called short-finned molly [6].

***Xiphophorus hellerii* (Heckel, 1848):** Gk. *ksiphos* means a kind of double-edged sword and *-phoros* means bearing [36]. The genus name *Xiphophorus* would have been taken after the shape of elongated caudal fin of male fish, since it bears a sword like projection with its lower lobe. The specific epithet *hellerii*: named in honour of Austrian botanist and naturalist Karl Bartholomaeus Heller (1824-1880), who explored Mexico in between 1845-1848 and brought the type series of *X. hellerii* (a brightly colored, playful top minnow, a small surface swimming fish) to Vienna [41]. *Xiphophorus* is a popular tropical aquarium fish and better known as sword tail. Wild populations are

found in Southern Africa, including Hawaii, Madagascar, Otjikoto Lake in Namibia and East Coast of Australia [7].

***Astronotus oscillatus* (Agassiz, 1831):** Gk. *astra* means ray and *noton* means back; refers to ray-backed and *ocellatus*: from the Latin adjective *ocellatus*-with little eyes [42], derived from ocellus, diminutive of oculus eye-alluding to the lateral spot, which is rounded and has an external resemblance with the eyes. *Astronotus ocellatus*, commonly known as the oscar, native to north America, is a large predatory cichlid and very popular worldwide as an ornamental freshwater fish [43].

***Symphysodon discus* (Heckel, 1840):** Gk. *syn*, *symphysis* means grown together and *odon* means teeth [36]; refers to regular shape of teeth. Latin *discus* means disk-a heavy circular object which athletes try to throw as far as they can [13]. *Symphysodon*, commonly known as discus, is a genus of cichlids native to the Amazon river basin. Due to their distinctive shape and bright colors, discus is popular as freshwater aquarium fish, and their aquaculture in several countries in Asia is a major industry [44].

***Betta splendens* (Regan, 1910):** The Gk. word *betta* means as good as anything will ever be [14]. *Betta* has a very good balance of shape and form, from the mouth to the end of the fins, the neon bright scales and fins, and the most impressive style of flaring and dancing (bettysplendens.com). A fish of the genus *Betta*, especially *Betta splendens*, also known as a Siamese fighting fish, any of various labyrinth fishes of the genus *Betta*. Bettas are anabantoids (fishes with labyrinthiform pharyngeals), which means they can breathe atmospheric air using a lung-like organ called the labyrinth. The word anabantoid is derived from the Gk. word *anabas* means to travel up [12]. This refers to the fish makes a visit to the water surface to take a breath of air. The labyrinth organ is a much-folded suprabranchial accessory breathing organ found in labyrinth fish, of the Anabantoidei family, formed by vascularized expansion of the epibranchial of the first gill arch [45]. Latin *splendens* denotes brilliant, glistening [22], indicates brightly colored, long-finned freshwater fishes of the genus *Betta*. It is native to Southeast Asia, especially in Thailand to Malay Peninsula [46].

***Trichogaster leeri* (Bleeker, 1852):** Gk. *thrix* denotes hair and *gaster* denotes stomach; refers to the threadlike projection of pelvic fin [12]. The specific epithet *leeri* probably taken from leer; to leer [12], refers to cloudiness like twilight for the fish is covered with iridescent pearl and brown flecks that give it a mother of pearl appearance. The fish is commonly called pearl gourami, also known as lace gourami [8]. Other way the species would have been named

in honor of Thijs van Leeri for its reddish tinge to the cheek or throat. It is native to Asia, especially Thailand, Indonesia, Borneo and Sumatra [47].

***Hypostomus plecostomus* (Linnaeus, 1758):** Gk. *hypo* means directed to lower position and *stoma* means mouth [12], pertains to the fish ventral mouth position. Plecostomus- pleco or plec is the common name of several species of freshwater loricariid catfish (*Lorica*, a Latin word literally means body armour [48], may refer to a number of types of Ancient Roman military clothing, commonly sold as an aquarium fish. Pleco is used to refer to any member of a large family of catfish native to Central and South America that possess sucker shaped mouths that are often introduced to aquarium to eat algae or scum from the bottom of the tank [14]. It is commonly called Sucker mouth catfish.

***Kryptoterus bichirris* (Valenciennes, 1840):** Gk. *kryptos* means hidden and *pterygio* means fin [12], refers to the reduced fin in members of this genus (the dorsal fin is very small, consisting of only one ray, and glass catfish usually hold it down. It is well hidden most of the time [49]). It is known as glass catfish. The first thing to notice about the glass catfish is that it has transparent flesh (lacks scales and body pigment), which allows us to see the spinal cord and internal organs [9]. Its shiny skin resembles Bichir-an elongated African freshwater fish with an armor of hard shiny scales and a series of separate fins along its back [13]. Probably this peculiar morphology tempted the author to take the species name *bichirris*. It is native to Southeast Asia; slow-moving rivers with heavy vegetation in Borneo, Java, India, Indonesia, Thailand, Sumatra, Malaysia [50].

***Pterophyllum scalare* (Heckel, 1840):** Gk. *pteron* means fin and *phyllon* means leaf; probably refers to the tall wide and triangular dorsal fin [36]. The specific epithet *scalare* would have been derived from scalar, to describe the quantity with only magnitude [51], probably refers to the increment of body stripes of the fish to the increased proportion of its very high dorsal and anal fins. It is well known as angelfish. Angelfish are one of the most commonly kept freshwater aquarium fish, as well as the most commonly kept cichlid [52]. All *Pterophyllum* species originate from the Amazon basin, Orinoco basin and various rivers in the Guiana Shield in tropical South America [52].

V. CONCLUSION

Here 14 cultured and 14 aquarium exotic fish species have been discussed with their etymological background. Being exotic species the origin and distributions of the

fishes are also enclosed. All the mentioned exotic cultured and aquarium fishes have been purposely introduced in Bangladesh. Scientific name interpretation will help to identify the concerned species and subspecies. References are attached to the annexure. Readers are requested to follow the references for better clarification.

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