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ORNAMENTAL FISH DIVERSITY IN NORTH EAST INDIA

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The northeast region of India with their diversified freshwater resources harbour several important fish species of ornamental value. About 80-85% fish fauna of this region can be accounted under the ornamental category (Dey, 1989).

Some of these species are rare and endemic to only this region. Therefore, a good number of indigenous fish species of the region attract many hobbyists from different parts of the world. Some of the important indigenous fish species of northeast India having ornamental value .

Table 4. Important ornamental fish species of Northeast India

S.No	Type	Species
1.	Barbs and minnows	*Amblypharyngodon mola, A.jaya, A.morar, Laubuka laubuca, Esomus danrica, Devario aequipinnatus, D.dangila, D.devario, Rasbora daniconius, R.rasbora, Barilius barila, B.bendelisis, B.shacra, B.vagra, B.tileo, Garra bispinosa, G.lissorhynchus, G.gotyla, Oreichthys cosuatis, Puntius chola, Puntius ticto, Pethia conchonius, Puntius sophore, Crossocheilus burmanicus*
2.	Catfishes	*Ailia coila, Batasio tangana, Pachypterus atherinoides, Erethistes pusillus, Hara hara, Hara jerdoni, Glyptothorax cavia, G.pectinopterus, G.horai, G.coheni, G.brevipinnis, Creteuchiloglanis kamengensis, Exostoma labiatum, Psedecheneis sulcatus, Olyra longicaudata, Sisor robdophorus, Mytus vittatus, M.cavasius*
3.	Eel	*Macrognathus aculeatus* (Spiny eel), *Mastacembalus armatus*
4.	Glass fish	*Chanda nama, Parambassis lala*
5.	Gourami	*Trichogaster fasciata, T. labiosa*
6.	Loaches	*Aborychthys spp., Nemacheilus spp., Acanthocobitis botia, Amblyceps spp., Lepidocephalus spp.*
7.	Needle fish	*Xenentodon cancila*
8.	Perch	*Badis badis, Nandus nandus*
9.	Snake head	*Channa barca, C.marulius, C.striatus, C.orientalis*
10.	Puffer fish	*Leiodon cutcutia*
11.	Knife fish	*Notopterus notopterus*

Majority of the total Indian ornamental fish trade is rooted from wild catch and is contributed by this region of Inso far .

On to the diversity of topographic and climatic features of NE India, this region is rich in endemic fish.

Most of the small food fish which are treated have awanted for conventional farming have good potency as ornamental fishes and With and properly known as Aquarium fishes. .

These species are attract hobbyists both locally and globally. This region of the country is important in view of large-scale production from capture fishery underlined b he existence of innumerable rivers, rivulets and lentic water bodies, which harbor plenty of diverse fish fauna.

There are about 267 species belong to 136genera of fresh water fishes inhabiting in Northeast India .

Out of which, 54.32% possess either of the three values as food for human, complacent in angliof tourism , aquarium fish trade, and are thus potential resources for the growth of economy.

Aquarium fishes are categorized based On various color pattern (colorful),morphologically unique born and behaviorally charismatic .

The current checklist of fishes of North East India showed 250 potential ornamental fish species, Out of this, the highest no. recorded from Assam (187), followed by ArunachalPradesh (165), Meghalaya (159), Manipur (139),Tripura(103), Nagaland(71), Mizoram(46), and Sikkim(29).

Many endemic fish species are being traded from the wild harvest, due to lack of established species-specific culture or breeding, and serve as a threat to biodiversity from harvest pressure.

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According to Biswas et al. (2015), 109 fish species of northeast India can be considered as potential ornamental species at least in their early stages of life or during breeding season.

Among these, 41 belong to Cyprinidae, 14 belong to Sisoridae, 12 to Cobitidae, 6 each from Balitoridae and Bagridae and 4 each from the family Chandidae, Channidae and Mastacembellidae.

A preliminary survey conducted by NATP (Das, 2004) reveals that about 25 fish species of ornamental value are being exported from this region especially from the state of Assam.

But the present trade is highly unorganised and most of these species are harvested from wild and sent to international markets through a few registered exporters in the country.

Ornamental fishes live in different water bodies in different ecosystem from cold water to warm water in India's Northeast region.

Pond, paddy field, channel, wetland, rivers are main habitat of native ornamental fishes in this region. Lakhimpur district, on the foothills of eastern Himalaya of Arunachal Pradesh in Assam's northeastern corner, has been an ideal habitat for many ornamental fishes found in nature.

The district, which is situated on the north bank of the Brahmaputra, has three big rivers —Subansiri, Ranganadi and Dikrong. A large number of tributaries from these major rivers flow through the district. Lakhimpur district also has 40% its area as flood plain and is covered by seasonal and perennial wetland.

These species are main ornamental fishes in this region ie. *Golden Barb*, Puntius, Rosy Barb, Giant Danio, Danio Dangila, Danio Aequipinnatus, Honey Gourami, Dwarf Gourami, Zebra Danio, Esomus Danricus, Badis Badis, Badis Assamensis, Botia Histrionica, Algae Eater, Lepidocephalus Thermalis, Sisor Rhabdophorus, Channa Barca, Channa Aurentimaculata, Tyretrack Eel, Spotted Eel, Tor Putitora, Tor Tor, Hara Jerdni, Silurus Berdmorei, Oreichthys Cosuatis, Puntius Conchonius, Puntius Ticto, Danio Aequipinnatus, Danio Dangila, Esomus Danricus, Lepidocephalus Thermalis, Bagarius Bagarius, Olyra Longicaudata, Colisa Fasciata, Channa Aurentimaculata, Glyptothorax Sp, Akysis Sp., Pseudolaguvia Shawi, Oreichthys Cosuatis, Puntius Conchonius and many more exotic species of native ornamental fishes in NE INDIA.

CAUSES OF EXTINCTION : According to Goswami, the major threat faced by the native ornamental fishes in this region is from natural calamity like earthquake. The eastern Himalaya region is a red seismic zone in Asia which saw a devastating earthquake in 1950.

Any more such calamity could greatly upset the natural eco-system of the ornamental fishes in this region, he feels. Human interference in nature and wanton destruction of natural ecosystems like using nylon net for fishing, poisoning of water bodies, blasting and deforestation have been frequently done in all major natural water bodies of the district stretching from the hills of Arunachal Pradesh to the banks of the Brahmaputra.

The uncontrolled use of pesticides and inorganic fertilizer in agriculture fields of the district has also caused great harms to the ornamental fishes among all other things.

The coming out of mega hydropower dams on rivers in Arunachal Pradesh is another worry as observed by Bikul Goswami for the existence of the ornamental fishes in this region.

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In a bid to preserve and promote the native ornamental fishes Bikul Goswami has been relentlessly working for captive breeding of the exotic species in the last three decades.

For that he has been for the promotion of indigenous medicinal herbs for the management of ornamental fish diseases..

Table 1. List of ornamental fish species recorded (April, 2012 to March, 2013) from Sonkosh River, BTC, Assam and their IUCN conservation status, 2013.

Order Family Name of the species IUCN

category

Clupeiformes: Notopteridae Notopterus notopterus (Pallas, 1769) LC

Cypriniformes

Cyprinidae

Amblypharygodon mola (Hamilton-Buchanan, 1822) LC

Cyprinion semiplotum (McClelland, 1839) VU

Oreichthys crenuchoides (Schafer, 2009) DD

Neolissochilus hexagonolepis (McClelland,1839) NT

Tor putitora (Hamilton, 1822) EN

Tor Progeneius (McClelland, 1839) NE

Danio dangila (Hamilton-Buchanan, 1822) LC

Pethia ticto (Hamilton, 1822) LC

Puntius sophore (Hamilton, 1822) LC

Puntius chola (Hamilton, 1822) LC

Aspidoparia jaya (Hamilton-Buchanan, 1822) LC

Cabdio morar (Hamilton-Buchanan, 1822) LC

Barilius bendelisis (Hamilton-Buchanan, 1822) NE

Barilius barila (Hamilton-Buchanan, 1822) LC

Barilius vagra (Hamilton, 1822) LC

Chela laubuca (Hamilton-Buchanan, 1822) LC

Danio devario (Hamilton-Buchanan, 1822

Danio rerio (Hamilton-Buchanan, 1822) LC

Balitoridae Aborichthys elongatus (Hora, 1921) NE

Acanthocobitis botia (Hamilton, 1822) LC

Cobitidae

Lepidocephalichthys guntea (Hamilton-Buchanan, 1822) NE

Botia daro (Hamilton, 1822) LC

Botia rostrata (Gunthur, 1868) VU

Somileptis gongota (Hamilton-Buchanan, 1822) LC

Siluriformes

Amblycipitidae

Amblyceps cerenium (Ng-Wright, 2010) NE

Amblyceps mangois (Hamilton, 1822) LC

Amplyceps arunachalensis (Nath & Dey, 1989) EN

Schilbeidae Ailia coila (Hamilton, 1822) NT

Sisoridae

Gagata cenia (Hamilton-Buchanan, 1822) LC

Glyptothorax cavia (Hamilton, 1822) LC

Glyptothorax telchita (Hamilton, 1822) LC

Olyridae Olyra kempi (Chaudhuri, 1912) LC

Chacidae Chaca chaca (Hamilton, 1822) LC

Synbranchiformes

Mastacembelidae Macrognathus aral (Bloch-Schneider, 1801) LC

Nandidae Badis badis (Hamilton-Buchanan, 1822) LC

Nandus nandus (Hamilton, 1822) LC

Badidae Badis assamensis (Ahl, 1937) DD

Dario dario (Hamilton, 1822) DD

Perciformes

Chandidae Chanda nama (Hamilton-Buchanan, 1822) LC

Osphronemidae Ctenops nobilis (McClelland, 1845) NT

Belontidae Trichogaster fasciatus (Bloch-Schneider, 1801) LC

Channidae

Channa gachua (Hamilton, 1822) NE

Channa marulius (Hamilton, 1822) LC

CONCLUSION: Conserving the native ornamental fishes through captive breeding has the great potentiality of creating a global market for the species, says Goswami. In India the northeastern states are taking a leading role in the native ornamental fish market .

The region contributes about 85% of the total global market of Ornamental fish (Goswami).

According to ICAR, the northeastern region has tremendous potential for ornamental fish production. The region can claim patenting right over the species and simultaneously make conservation effort. It can also contribute the lion's share of total native ornamental fishes in Northeast to the international market.

So far, the market of ornamental fish to the global demand has been largely unorganized and lacks any agency for its promotion.

Lack of proper packaging and transportation is also another challenge to this potential trade.

The trading of ornamental fishes in this region is mainly based on natural collection.

The fishes are collected form the wild habitat and marketed by traders who actually control the activities.

It has been observed that collection of ornamental fishes takes place in large number during the pick season.

The indiscriminate exploration of ornamental fishes from natural sources may lead to extinction of some of the rare varieties of them.

Further, there is an inherent danger of certain species disappearing from the region.

If the present mode of exploration continues unabated, it is high time to take immediate measures to conserve this natural wealth.

Thank you