Native and non-native ornamental aquarium fishes of Bangladesh
Md. Noor-E-Ishrak Hossain¹*, ABM Mohsin¹

¹Department of Fisheries, University of Rajshahi, Rajshahi-6205, Bangladesh
*ishrak.hossain.pro@gmail.com
*Corresponding author

ARTICLE INFO

Abstract:
The study was conducted in Dhaka, Bangladesh. It was carried out for twelve (12) months from March 2018 to February 2019 to prepare a complete update checklist of native and non-native aquarium fishes of Bangladesh. During the current study, 270 varieties (230 freshwater, 36 marine, and 4 brackish water) belong to 149 species (109 freshwater 73%, 36 marine 24% and 4 brackish water 3%) of 38 families under 10 orders and 6 crossbreeds’ varieties were recorded. Considering the number of species maximum 83 (55.70%) was found under the order Perciformes followed by Cypriniformes 24 (16.10%), Characiformes 18 (12.08%), Siluriformes 11 (7.38%), Osteoglossiformes 05 (3.35%), Atheriniformes 03 (2.01%), Lepisosteiformes 02 (1.34%), Polypteriformes 01 (0.6%), Myliobatiformes 01 (0.67%) and Cyprinodontiformes 01 (0.67%). The top five popular species were guppy (13.16%) followed by goldfish (12.39%), molly (8.54%), angelfish (6.23%), platy (5.93%). The number of fish species’ increasing tendency was 5.96 times in the last 15 years, and 3.31 times in the last ten years. Local farms and aquarists’ breeders bred 76 varieties under 23 species due to its high demand and profitability. Pricing varied on varieties, species, size and breeding status (local or abroad), availability, and ranged from BDT 40.00-80,000.00 per pair. According to the findings, aquarium fisheries are highly profitable and will be a potential sector in Bangladesh.

How to cite:
Hossain, M. N. , and Mohsin ABM. 2021. Native and non-native ornamental aquarium fishes of Bangladesh. IJOTA 4(1): 1–13. DOI: https://doi.org/10.22219/ijota.v4i1.14023

Copyright © 2021, Hossain and Mohsin. This is an open access article under the CC-BY-SA license

1. Introduction

Localized in South Asia, having spidery webs like rivers, low-lying lands, and immense potential of aquatic biodiversity resources, it is inevitable that fish plays an integral part in the people's daily lives in Bangladesh. Aquarium fishes are attractive colorful fishes of various characteristics, which are kept as pets in confined space of an aquarium or a garden pool for fun and fancy (Chakravartty et al., 2012). These living jewels need not always have bright colors, as sometimes their peculiar characteristics such as body color, morphology, mode of taking food, etc. may also add to their
attractiveness (Selvarasu & Sankaran, 2010). An aquarium is an enclosed body of water containing a mixture of selected and unselected captive living aquatic organisms. It is essentially unstable, and to obtain stability must be carefully designed and managed (Suxena 2003).

Ahmed (1956) recorded three import fish species, which were- Gourami (Trichogaster pectoralis) from Singapore in 1952, Goldfish (Carassius auratus) from West Pakistan in 1953, and Tilapia (Oreochromis mossambicus) from Thailand in 1954. But now, this business is widespread all over the country (Akhter, 1995). The business of ornamental fish is now very popular globally and a rapidly growing venture in Bangladesh (Galib and Mohsin, 2010). Nowadays, farmers and investors are very interested in moving their business to more diversified fields such as crocodile culture, pearl culture, aquarium fish trades, etc. (Mostafizur et al., 2009). The study area was selected in Dhaka city because it is considered the hub of aquarium fish trade in Bangladesh. However, previous studies were done long ago, such as 22 varieties by Arif et al. (2018), 29 varieties by Alam et al. (2016), 17 varieties under 12 species by Galib et al. (2013), 25 species by Faruk (2012), 79 varieties under 46 species by Galib and Mohsin (2011), 30 species by Mostafizur et al. (2009), 12 species by Mohsin et al. (2007) and 25 species by Rahman (2005). The present study was conducted following some specific objectives- to know the types, availability, breeding status, and price.

2. Material and methods

The study was conducted at the Katabon aquarium fish market, Tajmahal road, Mohammadpur, Hatipool road, and Kachukhet, Mirpur in Dhaka city period of twelve (12) months from March 2018 to February 2019. Frequent field visits were made during the study period to study area for collection of primary data. The primary data were collected by a survey divided into their sub-divisions, such as eye observation, farm walk, and interview with a questionnaire. Forty different aquarium shops and 40 respondents of aquarium shopkeepers, 20 respondents of aquarium hobbyists, and 5 respondents of aquarium fish breeders were interviewed during the survey. Primary data and the fish species' identification for creating the checklist were cross-checked with secondary data such as journals, books, authentic online databases, online ornamental fish shops, and other published documents. A taxonomic study was used to prepare the checklist of aquarium fish. The availability of ornamental aquarium fish was determined by counting the numbers of individual species and varieties. Numeric data were analyzed using Microsoft Excel 2016. Textual data were formed with the help of Microsoft Word 2016.

3. Results and Discussion

The checklist consists of 270 aquarium fish varieties under 149 species, 115 genera and excluding 6 cross breeds (Table 1).

| Order     | Family              | Scientific name                  | Common name (English) | Habitat | Availability | Breeding status (Non-native fish) | Native and Non-native status | Price range (BDT/pair) |
|-----------|---------------------|----------------------------------|-----------------------|---------|--------------|----------------------------------|-----------------------------|------------------------|
| Cypriniformes | Apteronotidae    | Apteronotus albifrons           | Black ghost knife fish | FW      | R            | I                                | NN                          | 850-1100               |
| Cyprinidae | Balantiocheilos melanopto | Puntigrus tetrazona          | Silver shark          | FW      | C            | I                                | NN                          | 150-250                |
|           | Puntigrus tetrazona |                                  | Green tiger barb      | FW      | VR           | I                                | NN                          | 220-260                |
|           | Puntigrus tetrazona |                                  | Tiger barb            | FW      | VC           | LB and I                         | NN                          | 60-120                 |
|           | Puntigrus tetrazona |                                  | Golden tiger barb     | FW      | R            | I                                | NN                          | 150-220                |
| Order | Family | Scientific name | Common name (English) | Habitat | Availability | Breeding status (Non-native species) | Native and Non-native status | Price range (BDT/pair) |
|-------|--------|-----------------|-----------------------|---------|-------------|--------------------------------------|-----------------------------|------------------------|
| Puntius tetrazona | | Albino tiger barb | FW R I | I | NN | 180-250 |
| Salvinia denisoni | | Denison barb | FW VR I | I | NN | 1100-1300 |
| Barbonymus schwanerfeldii | | Tinfoil barb | FW R I | I | NN | 220-380 |
| Pethia nigroscapata | | Ruby barb | FW VR I | I | NN | 400-450 |
| Puntius tictuya | | Cherry barb | FW VR I | I | NN | 160-180 |
| Pseudobagrus oxycephalus | | Rosy barb | FW C LB and I | N | | 120-180 |
| Danio rerio | | Zebra danio | FW C LB and I | NN | | 80-120 |
| Devario ssp | | Fireline devario | FW VR I | I | NN | 350-400 |
| Danio nigroscapatus | | Spotted danio | FW VC LB and I | NN | | 90-120 |
| Carassius auratus | | Black moor | FW VC LB and I | NN | | 80-450 |
| Carassius auratus | | Bubble eye | FW VR I | I | NN | 400-2000 |
| Carassius auratus | | Calico | FW C LB and I | NN | | 80-300 |
| Carassius auratus | | Celestine Eye | FW R I | I | NN | 120-450 |
| Carassius auratus | | Comet | FW VC LB and I | NN | | 80-350 |
| Carassius auratus | | Fantail | FW VC LB and I | NN | | 80-750 |
| Carassius auratus | | Veiltail | FW C LB and I | NN | | 180-450 |
| Carassius auratus | | Lionhead | FW C LB and I | NN | | 120-550 |
| Carassius auratus | | Oranda | FW VC LB and I | NN | | 200-450 |
| Carassius auratus | | Redcap | FW VC LB and I | NN | | 150-450 |
| Carassius auratus | | Ryukin | FW C LB and I | NN | | 250-650 |
| Carassius auratus | | Pearl scale | FW C LB and I | NN | | 600-1500 |
| Carassius auratus | | Shubunkin | FW C LB and I | NN | | 180-500 |
| Cyprinus carpio | | Assorted koi | FW VC LB and I | NN | | 120-500 |
| | | Common carp | FW | | | |
| | | Tiger koi carp | FW C LB and I | NN | | 120-2000 |
| Trigonostigma heteromorpha | | Harlequin rasbora | FW VR I | | | 250-450 |
| Danio margaritatus | | Galaxy rasbora | FW VR I | | | 800-1200 |
| Trigonostigma hengeli | | Glowlight rasbora | FW R I | | | 250-450 |
| Epalzeorhynchos frenatus | | Albino shark | FW R I | | | 180-220 |
| Epalzeorhynchos frenatus | | Rainbow shark | FW VC I | | | 120-140 |
| Myxocyprinus asiaticus | | High fin shark | FW R I | | | 3000-3500 |
| Puntius denticus | | Roseline shark | FW VR I | | | 800-1200 |
| Acanthopsis choerinus | | Horse-face loach | FW VR I | | | 250-450 |
| Chromobotia macracanthus | | Clown loach | FW R I | | | 600-650 |
| Botia lohachati | | Y-loach | FW R I | | | 180-350 |
| Botia kubotai | | Burmese Border loach | FW C I | | | 250-550 |
| Botia dario | | Bengal loach | FW C I | | | 120-220 |
| Siliformes | | | | | | | | |
| Callichthyidae | | Corydoras aeneus | | | | | | |
| Corydoras panda | | Corydoras julli | | | | | | |
| Corydoras julii | | Cormys barb | | | | | | |
| Clariidae | | Clarias batrachus | | | | | | |
| Pimelodidae | | Phractocephalus hemioliopterus | | | | | | |
| Pseudoplatystoma tigrinum | | Tiger | FW R I | | | 800-1000 |
| Loricariidae | | Hypostomus plecostomus | | | | | | |
| Otocinclus vittatus | | Dwarf suckers | FW R I | | | 400-550 |
| Pangasidae | | Pangasius hypophthalmus | | | | | | |
| Siluridae | | Kryptopterus bicirr | | | | | | |
| Schilbeidae | | Phractocephalus hemioliopterus | | | | | | |
| Characidae | | Aphyocharax anisitsi | | | | | | |
| Gymnocorymbus ternetzi | | Black skirt tetra | FW R I | | | 160-200 |
| Hemigrammus bleheri | | Rummy nose tetra | FW C I | | | 200-220 |
| Hypheosbycon megalopterus | | Phantom tetra | FW C I | | | 130-150 |
| Order       | Family          | Scientific name          | Common name (English) | Habitat | Availability | Breeding status (Non-native fish) | Native and Non-native status | Price range (BDT/pair) |
|-------------|-----------------|--------------------------|-----------------------|---------|--------------|-----------------------------------|-------------------------------|------------------------|
| Osteoglossiformes | Osteoglossidae | Osteoglossum bicirrhosum | Silver arowana        | FW      | VR           | I                                 | NN                           | 1500-8500               |
|              |                 | Scleropages formosus     | Golden or Asian arowana | FW      | R            | I                                 | NN                           | 20000-80000             |
|              |                 | Osteoglossum ferreirai   | Black arowana         | FW      | VR           | I                                 | NN                           | 18000-40000             |
|              |                 | Notopteridae             | Chitala omata         | FW      | VR           | I                                 | NN                           | 650-850                |
|              |                 |                          | Gnathonemus petersii  | FW      | R            | I                                 | NN                           | 950-2000               |
| Atheriniformes | Melanoactiidae  | Melanoactia praecox      | Dwarf rainbowfish     | FW      | VR           | I                                 | NN                           | 1500-2100               |
|              |                 | Inritherina werneri      | Threadfin rainbowfish | FW      | VR           | I                                 | NN                           | 1600-2200              |
|              |                 | Melanoactia boesemani    | Boeseman’s rainbowfish | FW      | VR           | I                                 | NN                           | 1300-2300              |
| Lepisosteiformes | Lepisosteidae  | Lepisosteus oculatus     | Spotted gar           | FW      | R            | I                                 | NN                           | 500-800                |
|              |                 | Atractosteus spatula     | Alligator gar         | FW      | C            | I                                 | NN                           | 250-600                |
| Polypteriformes | Polypteridae   | Epetychius calabaricus   | Reedfish              | FW      | VR           | I                                 | NN                           | 650-800                |
| Perciformes  | Ambassidae      | Parambassis ranga        | Glass fish            | FW      | R            | I                                 | N                            | 120-180                |
|              | Belontiidae     | Betta splendens          | Veiltail betta        | FW      | C            | LB and I                          | NN                           | 350-400                |
|              |                 | Delta tail betta fish    | FW                   | VR      | I            | I                                 | NN                           | 600-700                |
|              |                 | Betta splendens          | Yellow butter fly betta | FW     | VR           | I                                 | NN                           | 1400-1600              |
|              |                 | Betta splendens          | Feather tail betta    | FW      | VR           | I                                 | NN                           | 1600-1800             |
|              |                 | Betta splendens          | Placket betta         | FW      | R            | I                                 | NN                           | 1100-1200             |
|              |                 | Betta splendens          | Comtail betta         | FW      | VR           | I                                 | NN                           | 1700-1400             |
|              |                 | Betta splendens          | Rose-tail betta       | FW      | R            | I                                 | NN                           | 1250-1400             |
|              |                 | Betta splendens          | Double tail betta     | FW      | R            | I                                 | NN                           | 1000-1200             |
|              |                 | Betta splendens          | Half-tail betta       | FW      | VR           | I                                 | NN                           | 1300-1400             |
|              |                 | Betta splendens          | Full-tail betta       | FW      | VC           | LB and I                          | NN                           | 1000-1200             |
|              |                 | Betta splendens          | Half-moon tail betta  | FW      | VR           | I                                 | NN                           | 1250-1350             |
|              |                 | Betta splendens          | Full-moon tail betta  | FW      | VR           | I                                 | NN                           | 1100-1200             |
|              |                 | Betta splendens          | Crown tail betta      | FW      | VC           | LB and I                          | NN                           | 450-550                |
|              |                 | Betta splendens          | Koi half-moon betta   | FW      | VR           | I                                 | NN                           | 2200-2400             |
|              |                 | Betta splendens          | Spade betta           | FW      | VR           | I                                 | NN                           | 1250-1400             |
|              | Channidae       | Channa bleheri           | Rainbow               | FW      | VR           | I                                 | NN                           | 5500-6000             |
|              |                 |                          | Snakehead             | FW      | VR           | I                                 | NN                           |                      |
|              | Badidae         | Dario dario              | Scarlet badis         | FW      | VR           | I                                 | NN                           | 350-550                |
|              | Cichlidae       | Aequidens pulcher         | Blue acara            | FW      | VR           | I                                 | NN                           | 220-350                |
| Order                    | Family         | Scientific name                  | Common name (English) | Habitat  | Availability | Breeding status (Non-native fish) | Native and Non-native status | Price range (BDT/pair) |
|-------------------------|----------------|----------------------------------|-----------------------|----------|--------------|----------------------------------|------------------------------|-----------------------|
| Maylandia lombardoi     |                | Lombardoi mbuna cichlid          | FW VR I               | I        | NN           | 600-800                          |
| Maylandia lombardoi     |                | Kenyi cichlid                    | FW VR I               | I        | NN           | 950-1450                         |
| Cyphotilapia frontosa   |                | Humphhead cichlid                | FW R I                | NN       | 600-1200     |
| Trichromis salini       |                | Yellow belly cichlid             | FW VR I               | I        | NN           | 550-1250                         |
| Mikrogeophagus ramirezi |                | Ram Cichlid                      | FW C                  | LB and I | NN           | 950–1500                         |
| Pseudotropheus crablo   |                | Bumblebee                        | FW VR I               | I        | NN           | 1000-1800                        |
| Pseudotropheus demasoni |                | Mouth brooder                    | FW VR I               | I        | NN           | 1800-2500                        |
| Haplochromis nyrerei    |                | Nyererei                         | FW VR I               | I        | NN           | 1500-2200                        |
| Cichlasoma auratus      |                | Venustus cichlid                 | FW C                  | LB and I | NN           | 750-1000                         |
| Cichlasoma auratus      |                | Blue dolphin cichlid             | FW C                  | LB and I | NN           | 1200-1800                        |
| Geophagus sp.           |                | Earth-eater                      | FW VR I               | I        | NN           | 1600-2000                        |
| Julidochromis transcriptus |              | Julies                           | FW VR I               | I        | NN           | 1200-1800                        |
| Aulonocara sp.          |                | Sunshine peacock                | FW R I                | I        | NN           | 350-1250                         |
| Labeotropheus fuellebori|                | Five color cichlid               | FW VR I               | I        | NN           | 350-850                          |
| Heros Efasciatus        |                | Red spot severum                | FW R I                | I        | NN           | 650-850                          |
| Astronotus ocellatus    |                | Golden oscar                     | FW VR I               | I        | NN           | 800-2500                         |
| Astronotus ocellatus    |                | Red oscar                        | FW C                  | LB and I | NN           | 700-2000                         |
| Astronotus ocellatus    |                | Longfin oscar                    | FW VR I               | I        | NN           | 1200-4000                        |
| Astronotus ocellatus    |                | Albino tiger oscar               | FW C                  | LB and I | NN           | 700-2000                         |
| Astronotus ocellatus    |                | Albino red oscar                 | FW C                  | LB and I | NN           | 700-2000                         |
| Astronotus ocellatus    |                | Albino oscar                     | FW R I                | I        | NN           | 700-2000                         |
| Astronotus ocellatus    |                | Blue dolphin cichlid             | FW VR I               | I        | NN           | 1200-1800                        |
| Cichlasoma citrinellum x C. synspilum | | Blood red parrot        | FW VR I               | I        | NN           | 650-3000                         |
| Cichlasoma citrinellum x C. synspilum | | Green parrot               | FW VR I               | I        | NN           | 800-3600                         |
| Cichlasoma citrinellum x C. synspilum | | Red heart shape parrot       | FW VR I               | I        | NN           | 1000-4000                        |
| Cichlasoma citrinellum x C. synspilum | | Red love parrot             | FW C                  | LB and I | NN           | 450-2500                         |
| Cichlasoma citrinellum x C. synspilum | | Yellow love parrot           | FW C                  | LB and I | NN           | 450-2600                         |
| Cichlasoma citrinellum x C. synspilum | | White parrot               | FW VR I               | I        | NN           | 550-2500                         |
| Melanochromis auratus   |                | Golden mbuna                     | FW C                  | LB and I | NN           | 300-500                          |
| Pterophyllum scalare    |                | Black angel                      | FW VC                 | LB and I | NN           | 50-550                           |
| Pterophyllum scalare    |                | Marble angel                     | FW C                  | LB and I | NN           | 50-550                           |
| Pterophyllum scalare    |                | Sunset angel                     | FW C                  | LB and I | NN           | 80-750                           |
| Pterophyllum scalare    |                | Koi angel                        | FW C                  | LB and I | NN           | 80-700                           |
| Pterophyllum scalare    |                | Leopard angel                    | FW R I                |         | NN           | 130-850                          |
| Pterophyllum scalare    |                | Veil-tail angel                  | FW C                  | LB and I | NN           | 120-650                          |
| Pterophyllum scalare    |                | Blue angel                       | FW R I                |         | NN           | 180-850                          |
| Pterophyllum scalare    |                | Zebra angel                      | FW VC                 | LB and I | NN           | 60-600                           |
| Pterophyllum scalare    |                | Gold angel                       | FW R I                |         | NN           | 100-800                          |
| Pterophyllum scalare    |                | Altum angel                      | FW R I                |         | NN           | 120-750                          |
| Pterophyllum scalare    |                | Silver angel                     | FW C                  | LB and I | NN           | 80-650                           |
| Pterophyllum scalare    |                | Albino angel                     | FW VC                 | LB and I | NN           | 100-700                          |
| Symphysodon discus      |                | Brown discus                     | FW VR I               | I        | NN           | 1500-6000                        |
| Order            | Family          | Scientific name | Common name (English) | Habitat | Availability | Breeding status (Non-native fish) | Native and Non-native status | Price range (BDT/pair) |
|------------------|-----------------|-----------------|-----------------------|---------|--------------|-----------------------------------|-------------------------------|------------------------|
| **Order**        | **Family**      | Symphysodon discus | Turquoise blue discus | FW C    | LB and I     | NN                                | 2200-4800                     |
| Symphysodon discus | Poeciliidae     | Blue diamond discus | FW VR I               | I       | NN           | 1500-4500                         |
| Symphysodon discus | Poeciliidae     | Red Marlboro discus | FW VR I               | I       | NN           | 1500-5000                         |
| Symphysodon discus | Poeciliidae     | Brilliant blue discus | FW R I               | I       | NN           | 2200-4800                         |
| Symphysodon discus | Poeciliidae     | Red eagle discus | FW R I               | I       | NN           | 1800-5000                         |
| Symphysodon discus | Poeciliidae     | Ghost discus | FW VR I               | I       | NN           | 2500-6000                         |
| Symphysodon discus | Poeciliidae     | Pigeon blood discus | FW C                 | LB and I | NN           | 2200-4500                         |
| Symphysodon discus | Poeciliidae     | Red turquoise discus | FW VR I               | I       | NN           | 2500-5000                         |
| Symphysodon discus | Poeciliidae     | Marble discus | FW VR I               | I       | NN           | 1900-4200                         |
| Symphysodon discus | Poeciliidae     | Tomato discus | FW VR I               | I       | NN           | 1400-4000                         |
| Symphysodon discus | Poeciliidae     | Red snake skin discus | FW R I               | I       | NN           | 1500-4500                         |
| Symphysodon discus | Poeciliidae     | Golden pigeon discus | FW C                 | LB and I | NN           | 900-3500                          |
| Symphysodon discus | Poeciliidae     | Red ruby discus | FW R I               | I       | NN           | 1500-4600                         |
| Symphysodon discus | Poeciliidae     | Yellow Marlboro discus | FW R I               | I       | NN           | 1800-5000                         |
| Symphysodon discus | Poeciliidae     | Red turquiose discus | FW VR I               | I       | NN           | 2000-4500                         |
| Symphysodon discus | Poeciliidae     | Red pearl pigeon discus | FW R I               | I       | NN           | 1600-4500                         |
| Symphysodon discus | Poeciliidae     | Pigeon blood snake skin discus | FW VR I | I | NN | 1500-5500 |
| Symphysodon discus | Poeciliidae     | Checker board discus | FW VC | LB and I | NN | 750-3500 |
| Symphysodon discus | Poeciliidae     | Golden pearl discus | FW VR I               | I       | NN           | 1300-4500                         |
| Symphysodon discus | Poeciliidae     | White scorpion discus | FW VR I | I | NN | 1000-4000 |
| Symphysodon discus | Poeciliidae     | Red brown discus | FW R I               | I       | NN           | 900-3500                          |
| Symphysodon discus | Poeciliidae     | White pigeon redline discus | FW R I | I | NN | 800-4000 |
| Symphysodon discus | Poeciliidae     | Snow white discus | FW R I               | I       | NN           | 1200-4500                         |
| Symphysodon discus | Poeciliidae     | Red white diamond | FW VR I               | I       | NN           | 1000-3500                         |
| Symphysodon discus | Poeciliidae     | Yellow-white diamond | FW R I | I | NN | 1500-4000 |
| Gobidae           | Helostomatidae  | Brachypholis xanthozonu | Red melon | FW C | LB and I | NN | 1200-4500 |
| Helostoma terminali | Trichogaster pectoralis | Bumblebee goby | FW VR I | I | NN | 500-650 |
| Trichogaster pectoralis | Helostoma terminali | Kissing gourami | FW C | LB and I | NN | 180-2000 |
| Sphaerichthys osphronemoides | Colisa lalia | Snakeskin gourami | FW VR I | I | N | 200-220 |
| Osphronemus goramy | Colisa lalia | Dwarf gourami | FW VR | I | LB and I | NN | 200-220 |
| Trichogaster leeri | Colisa lalia | Honey gourami | FW C | LB and I | NN | 120-140 |
| Trichogaster trichopterus | Sphaerichthys osphronemoides | Chocolate gourami | FW VR I | I | NN | 1700-2200 |
| Poecilia reticulata | Osphronemus goramy | Giant gourami | FW VR I | I | NN | 1500-3500 |
| Poecilia reticulata | Trichogaster leeri | Pearl gourami | FW C | LB and I | NN | 220-380 |
| Poecilia reticulata | Trichogaster pectoralis | Blue gourami | FW VC | LB and I | NN | 180-200 |
| Poecilia reticulata | Trichogaster trichopterus | Golden gourami | FW C | LB and I | NN | 180-280 |
| Poecilia reticulata | Poecilia reticulata | Multicolor guppy | FW C | LB and I | NN | 40-80 |
| Poecilia reticulata | Poecilia reticulata | Sail fin guppy | FW C | LB and I | NN | 200-300 |
| Poecilia reticulata | Poecilia reticulata | Blue mosaic guppy | FW C | LB and I | NN | 350-500 |
| Order                | Family             | Scientific name       | Common name (English) | Habitat | Availability | Breeding status (Non-native fish) | Native and Non-native status | Price range (BDT/pair) |
|----------------------|--------------------|-----------------------|-----------------------|---------|--------------|-----------------------------------|-----------------------------|------------------------|
| Poecilia reticulata  |                    | Tuxedo blue dragon half-moon guppy | FW VR I | NN       | 100-200                      |
| Poecilia reticulata  |                    | Half black yellow guppy | FW R I              | NN       | 180-220                      |
| Poecilia reticulata  |                    | Tuxedo white high dorsal guppy | FW R I              | NN       | 250-300                      |
| Poecilia reticulata  |                    | Half black blue guppy | FW VR I              | NN       | 150-220                      |
| Poecilia reticulata  |                    | Albino blue tail guppy | FW VC LB and I     | NN       | 160-200                      |
| Poecilia reticulata  |                    | Blue eagle guppy     | FW VR I              | NN       | 400-500                      |
| Poecilia reticulata  |                    | Red lace guppy       | FW C LB and I       | NN       | 1000-1200                    |
| Poecilia reticulata  |                    | Yellow platinum guppy | FW R I              | NN       | 100-250                      |
| Poecilia reticulata  |                    | Yellow king cobra guppy | FW VR I          | NN       | 250-300                      |
| Poecilia reticulata  |                    | Elephant ear guppy   | FW VR I              | NN       | 900-1000                     |
| Poecilia reticulata  |                    | Yellow galaxy guppy  | FW VC LB and I      | NN       | 250-300                      |
| Poecilia reticulata  |                    | Blue neon guppy      | FW R I              | NN       | 150-200                      |
| Poecilia reticulata  |                    | Full pink guppy      | FW VR I              | NN       | 500-600                      |
| Poecilia reticulata  |                    | Purple mosaic guppy  | FW R I              | NN       | 350-500                      |
| Poecilia reticulata  |                    | Blue lace guppy      | FW VC LB and I      | NN       | 150-220                      |
| Poecilia reticulata  |                    | Full black guppy     | FW R I              | NN       | 200-250                      |
| Poecilia reticulata  |                    | Platinum half red sakura guppy | FW R I          | NN       | 180-300                      |
| Poecilia reticulata  |                    | Full red guppy       | FW R I              | NN       | 300-400                      |
| Poecilia sphenops    |                    | Moscow guppy         | FW VC LB and I     | NN       | 80-160                       |
| Poecilia sphenops    |                    | Balloon Molly (Golden) | FW C LB and I | NN       | 120-140                      |
| Poecilia sphenops    |                    | Balloon Molly (White) | FW C LB and I      | NN       | 120-140                      |
| Poecilia sphenops    |                    | Black molly          | FW C LB and I       | NN       | 120-130                      |
| Poecilia sphenops    |                    | Orange sailfin Molly | FW C LB and I       | NN       | 100-160                      |
| Poecilia sphenops    |                    | Golden calico sailfin Molly | FW C LB and I | NN       | 120-180                      |
| Poecilia sphenops    |                    | Golden Dust Molly    | FW C LB and I       | NN       | 200-300                      |
| Poecilia sphenops    |                    | Silver Sailfin Molly | FW VC LB and I     | NN       | 120-180                      |
| Poecilia sphenops    |                    | Mixed Color Molly    | FW VC LB and I      | NN       | 120-130                      |
| Poecilia sphenops    |                    | Lyre-tail Molly      | FW C LB and I       | NN       | 60-80                        |
| Poecilia sphenops    |                    | White Molly          | FW VC LB and I      | NN       | 80-200                       |
| Xiphophorus helleri  |                    | Mickey Mouse sword tail | FW C LB and I | NN       | 120-180                      |
| Xiphophorus helleri  |                    | Koi sword tail       | FW C LB and I       | NN       | 100-160                      |
| Xiphophorus helleri  |                    | Double tail sword tail | FW C LB and I | NN       | 180-250                      |
| Xiphophorus helleri  |                    | Hi-fin sword tail    | FW C LB and I       | NN       | 120-220                      |
| Xiphophorus helleri  |                    | Bumble Bee plathy    | FW C LB and I       | NN       | 80-180                       |
| Xiphophorus maculatus|                    | Hi-fin plathy        | FW C LB and I       | NN       | 120-200                      |
| Xiphophorus maculatus|                    | Wagtail plathy       | FW C LB and I       | NN       | 120-150                      |
| Xiphophorus maculatus|                    | Tuxedo plathy        | FW C LB and I       | NN       | 90-160                       |
| Xiphophorus maculatus|                    | Sunset plathy        | FW C LB and I       | NN       | 120-180                      |

Myliobatiformes Potamotrygonidae Potamotrygon motoro

Ocellate river stingray FW VR I NN 15000-25000
| Order            | Family                  | Scientific name | Common name (English) | Habitat | Availability | Breeding Status (Non-native fish) | Native and Non-native Status | Price range (BDT/pair) |
|------------------|-------------------------|-----------------|-----------------------|---------|--------------|----------------------------------|-------------------------------|------------------------|
| Perciformes      | Aplocheilidae           | Pachypanchax playfairii | Golden panchax        | FW      | VR           | I                                | NN                           | 300-400                |
|                  | Scatophagidae           | Scatophagus argus | Spotted scats         | BW      | VR           | I                                | NN                           | 180-350                |
|                  | Monodactylidae          | Monodactylus argenteus | Malayan angelfish     | BW      | VR           | I                                | NN                           | 300-600                |
|                  | Toxotidae               | Toxotes jaculatrix | Banded archerfish     | BW      | VR           | I                                | NN                           | 1500-2100              |
|                  | Cichlidae               | Etroplus maculatus | Orange chromides      | BW      | VR           | I                                | NN                           | 950-1500               |
| Perciformes      | Pomacentridae           | Amphiprion clarkia | Yellowtail clowndfish | M       | VR           | I                                | NN                           | 2500-5000              |
|                  |                        | Amphiprion frenatus | Tomato clowndfish     | M       | VR           | I                                | NN                           | 2000-4500              |
|                  |                        | Amphiprion tricinctus | Maroon clowndfish     | M       | VR           | I                                | NN                           | 3500-6500              |
|                  |                        | Amphiprion sebae   | Sebae clowndish       | M       | VR           | I                                | NN                           | 3000-7000              |
|                  |                        | Amphiprion ocellaris | Clown anemonefish    | M       | VR           | I                                | NN                           | 2000-4500              |
|                  |                        | Amphiprion albolatiss | Skunk clowndish       | M       | VR           | I                                | NN                           | 5500-6000              |
|                  |                        | Chromis viridis   | Blue green damselfish | M       | VR           | I                                | NN                           | 5000-5500              |
|                  |                        | Chromis analis    | Yellow chromis        | M       | VR           | I                                | NN                           | 950-1900               |
|                  |                        | Microspathodon chrysus | Yellowtail damselfish | M       | VR           | I                                | NN                           | 1200-2000              |
|                  | Pomacanthus coelestis   | Neon damselfish   | M VR I NN             |        |              |                                  |                              |                       |
|                  | Amblyglyphidodon leucogaster | Yellowbelly damselfish | M VR I NN             |        |              |                                  |                              |                       |
|                  | Neoglyphidodon crass   | Cross' damsel     | M VR I NN             |        |              |                                  |                              |                       |
|                  | Chryoptera parasema    | Goldtail demiselle| M VR I NN             |        |              |                                  |                              |                       |
|                  | Pygoplites dianthus    | Regal angelfish   | M VR I NN             |        |              |                                  |                              |                       |
| Acanthuridae     | Zebrasoma flavescens   | Yellow tang       | M VR I NN             |        |              |                                  |                              |                       |
|                  | Zebrasoma velifer      | Salimfin tang     | M VR I NN             |        |              |                                  |                              |                       |
|                  | Ctenochaetus strigosus  | Spotted surgeon fish | M VR I NN             |        |              |                                  |                              |                       |
| Labridae         | Acanthurus xanthopterus | Yellowfin tang    | M VR I NN             |        |              |                                  |                              |                       |
| Siganidae        | Siganus vulpinus       | Foxface           | M VR I NN             |        |              |                                  |                              |                       |
| Chaetodontidae   | Chaetodon vagabundus    | Vagabond butterflyfish | M VR I NN             |        |              |                                  |                              |                       |
|                  | Chaetodon rafflesi      | Latticed butterflyfish | M VR I NN             |        |              |                                  |                              |                       |
|                  | Chaetodon trifasciatus  | Melon butterflyfish | M VR I NN             |        |              |                                  |                              |                       |
| Blenniidae       | Enchelyurus flavipes    | Yellowfin blenny  | M VR I NN             |        |              |                                  |                              |                       |
|                  | Ecsenius bicolor       | Bicolor blenny    | M VR I NN             |        |              |                                  |                              |                       |
| Gobiidae         | Cryptocentrus cinctus  | Yellow prawn-goby | M VR I NN             |        |              |                                  |                              |                       |
| Serranidae       | Pseudanthias dispar     | Dispar Anthias    | M VR I NN             |        |              |                                  |                              |                       |
|                  | Centropyge bicolor     | Bicolor angelfish | M VR I NN             |        |              |                                  |                              |                       |
|                  | Centropyge tibicen      | Keyhole angelfish | M VR I NN             |        |              |                                  |                              |                       |
|                  | Centropyge nox         | Midnight angelfish | M VR I NN             |        |              |                                  |                              |                       |
|                  | Centropyge potteri     | Russet angelfish  | M VR I NN             |        |              |                                  |                              |                       |
|                  | Centropyge eibli       | Black tail angelfish | M VR I NN             |        |              |                                  |                              |                       |
| Pomacanthidae    | Pomacanthus imperator   | Emperor angelfish | M VR I NN             |        |              |                                  |                              |                       |
|                  | Pomacanthus navarchus   | Bluegirdled angelfish | M VR I NN             |        |              |                                  |                              |                       |
| Pseudochromidae  | Pictichromis porphyria  | Magenta dottyback | M VR I NN             |        |              |                                  |                              |                       |

Hossain and Mohsin. 2021 / IJOTA 4(1): 1–13
The number of fish variety, species, genera, family, and order of aquarium fishes recorded in the present study is higher than in previous studies (Table 2).

Table 2: The number of fish variety, species, genera, family, and order of recorded aquarium fishes mentioned in previous studies and the current study.

| Reference            | Area     | Year | Variety | Species | Genera | Family | Order |
|----------------------|----------|------|---------|---------|--------|--------|-------|
| Rahman               | Dhaka    | 2005 | -       | 25      | -      | -      | -     |
| Mohsin et al.        | Rajshahi | 2007 | -       | 12      | -      | -      | -     |
| Mostafizur et al.    | Khulna   | 2009 | -       | 30      | -      | -      | -     |
| Galib and Mohsin     | Dhaka    | 2011 | 79      | 46      | 42     | 18     | 5     |
| Faruk et al.         | Dhaka    | 2012 | -       | 25      | -      | -      | -     |
| Galib et al.         | Jessore  | 2013 | 17      | 12      | -      | 7      | 3     |
| Alam et al.          | Barisal  | 2016 | 29      | -       | -      | 12     | 6     |
| Arif et al.          | Sylhet   | 2018 | 22      | -       | -      | 10     | 4     |
| Current Study        | Dhaka    | 2019 | 270     | 149     | 115    | 39     | 10    |

Comparing the number of variety and species between different previous studies and the current study is shown in (Figure 1 and Figure 2) below. Table 1 and Figure 1, Figure 2 shows that the number of variety and species is much higher in Dhaka than in other areas (Rajshahi, Khulna, Jessore, Barisal, and Sylhet).

Figure 1: The number of variety of previous studies and the present study
Figure 2: The number of species of previous studies and the present study

Considering the number of species maximum 83 (55.70%) was found under order Perciformes followed by Cypriniformes 24 (16.10%), Characiformes 18 (12.08%), Siluriformes 11 (7.38%), Osteoglossiformes 05 (3.35%), Atheriniformes 03 (2.01%), Lepisosteiformes 02 (1.34%), Polypteriformes 01 (0.6%), Myliobatiformes 01 (0.67%), Cyprinodontiformes 01 (0.67%) (Figure 3).
and only 6 crossbreeds were recorded under Perciformes. Cypriniformes are dominant in Barisal (Alam et al., 2016), and Perciformes is dominant in Sylhet (Arif et al. 2018). On the other hand, Cypriniformes is also dominant in Jessore (Galib et al., 2013).

![Species number vs Order](Figure 3: Number of aquarium fish species within the order)

Recorded various aquarium fish species are included within three aquatic environments, such as freshwater, brackish water, and marine water. The number of aquarium fishes (varieties, species, genera, breeds) is given in Table 3. Except for the present study, no marine and brackish water aquarium fish were recorded in the previous studies.

Table 3: Number of recorded fish varieties, species, genera, and crossbreeds of the present study

| Aquatic environment | Number of varieties | Number of species | Number of genera | Number of crossbreeds |
|---------------------|---------------------|-------------------|------------------|-----------------------|
| Freshwater          | 230                 | 109               | 91               | 6                     |
| Brackish water      | 4                   | 4                 | 4                | 0                     |
| Marine              | 36                  | 36                | 20               | 0                     |
| **Total**           | **270**             | **149**           | **115**          | **6**                 |

During the survey, only 5 native wild fish species were found as an aquarium fish. According to the variety, they are categorized into 4 categories such as very rear, rear, common, and very common. During the study maximum number of varieties were very rear followed by rear, common and very common which is given in (Figure 4).

On the basis of breeding status of the species they are divided into 2 types such as imported, locally breed and imported. During the study major number of species were imported followed by locally breed and imported which is given in (Figure 5). Galib (2010) stated that, artificial breeding techniques of at least 17 varieties of exotic ornamental fishes have been developed by amateur fish breeders.
During the study most popular and highly contributed species in the surveyed shops were guppy (13.16%) followed by goldfish (12.39%), molly (8.54%), tetra (6.54%), angelfish (6.23%), platy (5.93%), gourami (5.48%), swordtail (4.41%), koi carp (3.79%), zebra fish (3.31%), barb (2.83%), suckermouth catfish (2.46%). In previous study according to consumer demand the most demandable aquarium fish species were goldfish, comet fish, koi carp, angle fish, platy, guppy, fighter fish, parrot fish and discus by Faruk et al. (2012).

The number of aquarium fish species, aquarium shops, aquarium fish breeders and hobbits have increased immensely due to the profitability for traders and acceptability by the aquarists.
During the study period 149 aquarium fish species are recorded which is 5.96 times in last 15 years (Rahman 2005, 25 species) and 3.31 times in last 10 years (Galib 2010, 45 species) (Figure 7). During the study it was recorded that 76 varieties of aquarium fish under 23 order were bred by local aquarium breeders and farms (Figure 8). On the other hand, according to Galib (2010), artificial breeding techniques of at least 17 varieties of exotic ornamental fishes have been developed by amateur fish breeders. According to present findings it is clearly indicated that the number of varieties as well species of native non-native ornamental aquarium fish is highly increased rapidly. Moreover, diversity of the habitat and number of locally breed non-native species are raised as well. It is concluded that the native and non-native ornamental aquarium fish breeding and keeping practice (hobby and business) is becoming a potential sector in Bangladesh.

**Conclusion**

Conclusion of this study is the provision of different types of feed significantly affect the level of gonadal maturity and fecundity of giant shrimp parent (Macrobrachium rosenbergii). The more effective treatment in giving different types of feed to the level of gonadal maturity and fecundity of broodstock parent is by feeding squid (Loligo sp.) Giving the best value at the gonad maturity level of 10 tails at the gonad mature speed. 2-6 days and the average fecundity of broodstock parent produced 28,846 ± 4925.35.

**Acknowledgement**

We want to express special thanks of gratitude to all the vendors and those who are connected with this sector for cooperating with us. We also want to acknowledge the researchers of the Department of Fisheries, the University of Rajshahi, for their excellent suggestions throughout the investigation.

**References**

Ahmed, N. (1956). Transplantation of food fish in Pakistan. *Journal of science*, 8(4), 00-00.

Akhter, S. M. (1995). Echo aqua fisheries project, Dhaka, 1st edition. Aquarium guide 71.
Alam, M. R., Alam, M. J., Pattadar, S. N., Karim, M. R., & Mahmud, S. (2016). A trend of ornamental fish business in Barisal division, Bangladesh. *International Journal of Fisheries and Aquatic Studies*, 4(3): 263-266.

Arif, A. S. M., Nusrat, S., Uddin, M., Alam, M. T., & Mia, M. R. (2018). Hobbyist’s preferences and trends in aquarium fish business at Sylhet Sadar Upazila, Bangladesh. *International Journal of Fisheries and Aquatic Studies*, 6(4): 392-398. https://www.fisheriesjournal.com/archives/?year=2018&vol=6&issue=4&part=E&ArticleId=1656

Chakravarty P., Chakravarty, M., & Sharma, S. (2012). A Survey on the Fish Diversity with Special Reference to the Classified Ornamental Fishes and their Prospects in the Kapla Beel of Barpeta District. *The Sci. Probe*, 1(2): 12-21.

Faruk, M. A. R., Hasan, M. M., Anka, I. Z, & Parvin, M. K. (2012). Trade and health issues of ornamental fishes in Bangladesh. *Bangladesh Journal of Progressive Science and Technology*, 10(2):163-168.

Galib, S. M., Imam, M. A., Rahman, M. A.,Mohsin, A. B. M., Fahad, M. F. H, & Chaki N. (2013). A study on aquarium fish business in Jessore district, Bangladesh. *Trends in Fisheries Research*, 2(3): 11-14.

Galib, S. M., & Mohsin, A. B. M. (2010). Exotic Ornamental Fishes of Bangladesh. *Bangladesh Journal of Progressive Science & Technology*, 8(2): 255-258.

Galib, S. M., & Mohsin, A. B. M. (2011). Cultured and Ornamental Exotic Fishes of Bangladesh. LAP-Lambert Academic Publishing, Germany 167.

Mohsin, A. B. M., Haque, M. E., & Islam, M. N. (2007). Status of aquarium fisheries of Rajshahi City. *Journal of Bio-Science*, 15:169- 171.

Mostafizur, M. R., Rahman, S. M., Khairul, M. I., Rakibul, H. M. I., & Nazmul, M. A. (2009). Aquarium business: A case study in Khulna district, Bangladesh. *Bangladesh Research Publication Journal*, 2(3): 564-570.

Rahman, A. K. A. (2005). Freshwater Fishes of Bangladesh, 2nd edition, Zoological Society of Bangladesh. Department of Zoology, University of Dhaka, Dhaka-1000. 23-33.

Selvarasu, A., & Sankaran, A. (2010). Marketing Strategies Vis-a-Vis Consumer Preference for Aquarium Business Service. *International Journal of Latest Trends in Finance and Economic Sciences*, 1:23-29.

Suxena, A. (2003). Aquarium management. Daya Publishing House. New Delhi-110035 230.