**Supplementary Table 1**. Natural occurrence, introduction pathway, biological and ecological aspects of non-native fishes introduced in aquatic systems of the Amazon Basin and native species transplanted to areas other than their natural distribution. Species arranged alphabetically by taxonomic Order and Family.\*(references)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Taxon** | **Native to** | **OCCURRENCE** | | | | | **Introduction pathway** | **Biological and Ecological Aspects of the species \*(references)** |
| **Bolivia** | **Brazil** | **Colombia** | **Ecuador** | **Peru** |
| **ATHERINIFORMES** |  |  |  |  |  |  |  |  |
| **Atherinopsidae** |  |  |  |  |  |  |  |  |
| *Odontesthes bonariensis* | From Argentina to the coastal region of the extreme south of Brazil | yes \*(13) | no | no | no | yes | aquaculture | Carnivore; high fecundity; multiple spawning \*(48, 58, 67, 101) |
| **BLENNIIFORMES** |  |  |  |  |  |  |  |  |
| **Blenniidae** |  |  |  |  |  |  |  |  |
| *Omobranchus punctatus* | Indo-Pacific | no | yes | no |  | no | ballast waterr and biofouling | Omnivorous; estuarine \*(41, 47, 85) |
| **CHARACIFORMES** |  |  |  |  |  |  |  |  |
| **Bryconidae** |  |  |  |  |  |  |  |  |
| *Brycon hilarii* | Paraguay River basin | no | yes | no | no | no | aquaculture | Omnivorous (herbivory tendency); migratory; without parental care \*(27, 56, 75) |
| **Prochilodontidae** |  |  |  |  |  |  |  |  |
| *Semaprochilodus insignis* | Amazon Basin | yes \*(13) | yes | yes | yes | yes \*(73) | aquarism | Detritivorous; high fecundity; migratory; without parental care \*(15, 54) |
| **Serrasalmidae** |  |  |  |  |  |  |  |  |
| *Colossoma macropomum* | Amazon and Orinoco basins | yes | yes | yes | yes | yes \*(73) | aquaculture | Omnivorous (frugivory tendency); high fecundity; migratory; without parental care \*(4, 5, 12, 99, 103) |
| *Piaractus brachypomus* | Amazon and Orinoco basins | yes | yes | yes | yes | yes | aquaculture | Omnivorous (frugivory tendency); high fecundity; migratory; without parental care \*(4, 5, 12, 98, 103) |
| *Piaractus mesopotamicus* | Amazon and Orinoco basins | yes \*(73) | yes | no | no | no | aquaculture | Omnivorous (frugivory tendency); high fecundity; migratory; without parental care \*(96, 98, 103) |
| Tambacu (*Colossoma* x *Piaractus* hybrid) | N/I | yes | no | no | no | no | aquaculture | Omnivorous \*(34) |
| **CICHLIFORMES** |  |  |  |  |  |  |  |  |
| **Cichlidae** |  |  |  |  |  |  |  |  |
| *Cichla monoculus* | Amazon River basin (in Brazil, Colombia and Peru) and Oyapock River basin | yes | yes | no | no | no | recreational | Carnivore (piscivory tendency); low fecundity; multiple spawning; parental care \*(20, 23, 44, 80) |
| *Cichlasoma orinocense* | South America: Amazon River basin, in the Madre  de Dios drainage | yes | yes | yes | no | yes | aquarism | N/I |
| *Coptodon rendalli* | Africa (Congo Basin), Lake Tanganyika, Lake Malawi | no | yes | yes \*(74) | no | yes | aquaculture | Omnivorous; low fecundity; multiple spawning; parental care \*(20, 28, 46, 66) |
| *Heterotilapia buttikoferi* | Africa (coastal rivers of Guinea-Bissau and Liberia) | no | yes | No | no | no | aquaculture | Omnivorous; multiple spawning \*(68, 79) |
| *Oreochromis mossambicus* | Coastal regions and the lower reaches of rivers in southern Africa, from the Bushman River in the Eastern Cape to Zambezi River delta. | no | no | yes | no | no | aquaculture | Omnivorous; low fecundity; parental care; high salinity tolerance \*(32,57) |
| *Oreochromis niloticus* | Africa (Coastal Zone of the Nile River basin) | yes \*(13) | yes | yes \*(74) | yes | yes\* (63) | aquaculture | Omnivorous (detritivory tendence); low fecundity; multiple spawning; parental care \*(26, 59, 76, 88, 105) |
| *Oreochromis urolepis* | Africa (Tanzania and Uganda - Wami River, Rufiji River and their tributaries, except the Delta) | no | yes | yes \*(74) | no | yes\* (63) | aquaculture | Omnivorous (detritivory tendence); high fecundity; high salinity tolerance \*(16, 93, 94) |
| *Parachromis friedrichsthalii* | Atlantic slope of Central America, from the Rio Usumacinta drainage in Mexico south to Honduras. | no | no | yes | no | no | aquarism | Piscivorous; low fecundity; parental care \*(90) |
| *Symphysodon aequifasciatus* | Amazon Basin | no | yes | yes \*(73) | no | yes \*(73) | aquarism | Omnivorous; multiple spawning; parental care \*(37) |
| **CYPRINIFORMES** |  |  |  |  |  |  |  |  |
| **Cyprinidae** |  |  |  |  |  |  |  |  |
| *Cyprinus carpio* | Eastern Europe and China | yes \*(13) | no | yes \*(74) | no | yes\* (63) | aquarism | Iliophagous; high fecundity; without parental care \*(1, 29, 53, 83, 99) |
| **Danionidae** |  |  |  |  |  |  |  |  |
| *Danio rerio* | Drainages from India and the East and Northeast Himalayas | no | yes | yes \*(74) |  | yes | aquarism | Omnivorous; multiple spawning; without parental care \*(6, 39, 72, 95) |
| **Xenocyprididae** |  |  |  |  |  |  |  |  |
| *Ctenopharyngodon idella* | East Asia | yes | no | yes | no | no | aquarism | Herbivore; high fecundity; migrator; without parental care \*(42, 89) |
| *Hypophthalmichthys molitrix* | China and Eastern Siberia (Russia) | yes | no | no | no | no | aquaculture | Planktivore; high fecundity; migratory; without parental carel \*(43, 104) |
| **CYPRINODONTIFORMES** |  |  |  |  |  |  |  |  |
| **Poeciliidae** |  |  |  |  |  |  |  |  |
| *Gambusia affinis* | Mexico and United States | yes \*(13) | no | yes | yes | no | aquarism | Omnivorous; ovoviviparous \*(69) |
| *Gambusia holbrooki* | Eastern United States | yes | no | no | no | no | aquarism | Zooplanktivorous; ovoviviparous \*(69, 82) |
| *Poecilia mexicana* | North and Central America | no | yes | no | no | no | aquarism | Omnivorous; low fecundity; non-migratory; ovoviviparous \*(76) |
| *Poecilia reticulata* | Brazil (Amapá and Pará), Guyana, Venezuela and Caribbean islands | yes \*(13) | yes | yes \*(74) | yes | yes\* (63) | aquarism | Omnivorous; ovoviviparous; reproduces throughout year \*(52, 55, 60, 62) |
| *Poecilia sphenops* | El Salvador; Guatemala; Honduras; Mexico (Veracruz, Chiapas, Oaxaca) | no | no | yes \*(74) | no | yes | aquarism | Omnivorous; ovoviviparous; reproduces throughout year \*(11, 51, 52) |
| *Xiphophorus helleri* | Belize; Guatemala; Honduras; Mexico (Chiapas); Mexico (Oaxaca, Campeche, Tabasco, Veracruz, Quintana Roo) | no | yes | yes \*(74) | yes | no | aquarism | Omnivorous; ovoviviparous; reproduces throughout year \*(81) |
| *Xiphophorus maculatus* | Mexico (Campeche, Chiapas, Oaxaca, Quintana Roo, Tabasco, Veracruz) | no | yes | yes \*(74) | yes | no | aquarism | Omnivorous; ovoviviparous; reproduces throughout year \*(19, 81) |
| *Xiphophorus variatus* | Mexico (Tamaulipas, Hidalgo, Puebla, San Luis Potosí, Veracruz) | no | no | yes | no | no | aquarism | Omnivorous; ovoviviparous; reproduces throughout year \*(52, 65) |
| **OSTEOGLOSSIFORMES** |  |  |  |  |  |  |  |  |
| **Arapaimidae** |  |  |  |  |  |  |  |  |
| *Arapaima gigas* | Amazon Basin (Brazil, Colombia, Ecuador and Peru) | yes | yes | yes \*(73) | yes | yes \*(73) | aquaculture | Piscivorous; low fecundity; multiple spawning; parental care \*(2, 14, 24, 40, 64) |
| **Osteoglossidae** |  |  |  |  |  |  |  |  |
| *Osteoglossum ferreirai* | Negro River basin in Brazil, and Tomo and Bita rivers in Colombia | no | yes \*(73) | yes | no | no | aquarism | Omnivorous (tendency carnivory); low fecundity; multiple spawning; parental care \*(22, 61, 70, 86) |
| **PERCIFORMES** |  |  |  |  |  |  |  |  |
| **Centrarchidae** |  |  |  |  |  |  |  |  |
| *Micropterus salmoides* | Canada and United States | no | no | yes | no | no | aquaculture | Omnivorous; multiple spawning; parental care \*(31, 38, 87, 100) |
| **Eleotridae** |  |  |  |  |  |  |  |  |
| *Butis koilomatodon* | Indo-Pacific | no | yes | no | no | no | ballast water | Carnivorous; non-migratory; estuarine \*(10, 47) |
| **Osphronemidae** |  |  |  |  |  |  |  |  |
| *Trichopodus pectoralis* | Indonesian lakes (Malay Peninsula, Thailand, Singapore) | no | no | yes | no | no | aquarism | Omnivorous; parental care \*(49) |
| *Trichopodus trichopterus* | South Asia (Mekong Basin) | no | yes | yes \*(74) | no | yes | aquarism | Omnivorous; parental care \*(30, 77, 91) |
| **SALMONIFORMES** |  |  |  |  |  |  |  |  |
| **Salmonidae** |  |  |  |  |  |  |  |  |
| *Oncorhynchus aguabonita* | United States (Kern River basin – California) | yes | no | no | no | no | aquaculture | Carnivorous; without parental care \*(33) |
| *Oncorhynchus mykiss* | Basins from Western Canada and the United States (Alaska) to Western Mexico | yes \*(13) | no | yes \*(74) | yes | yes\* (35, 63) | aquaculture | Carnivorous; moderate fecundity; facultative migrator; without parental care \*(17, 102) |
| *Salmo trutta* | Eurasia | yes | no | no | yes | yes | aquaculture | Carnivorous; facultative anadromous; without parental care \*(45, 71, 78, 92) |
| *Salvelinus fontinalis* | Easthern North America | yes | no | no | no | no | aquaculture | Carnivorous; facultative anadromous; without parental care \*(9, 18) |
| **SILURIFORMES** |  |  |  |  |  |  |  |  |
| **Doradidae** |  |  |  |  |  |  |  |  |
| *Pterodoras granulosus* | Amazon and Paraná River basins and coastal drainages in Guyana and Suriname. | yes | yes | yes | no | yes | overcome fish transposition systems of hydroelectrical impoundments | Omnivorous (tendency herbivory); high fecundity; migrator; without parental care \*(3, 25, 97) |
| **Pangasiidae** |  |  |  |  |  |  |  |  |
| *Pangasianodon hypophthalmus* | Chao Praya and Mekong basins in Cambodia, the Lao People's Democratic Republic, Thailand and Vietnam | no | no | yes | no | no | aquaculture and aquarism | Omnivorous; high fecundity; migrator; without parental care \*(36, 106) |
| **Pimelodidae** |  |  |  |  |  |  |  |  |
| *Brachyplatystoma juruense* | Amazon and Orinoco basins | yes \*(13) | yes | yes | yes | yes \*(73) | aquaculture | Piscivorous; migratory; without parental care \*(7, 21) |

References: Supplementary Table 1

1.Adámek, Z., Pardo. M., VilizzI, L., and Roberts J. (2015). Successful reproduction of common carp *Cyprinus carpio* in irrigation waterways. *Fish. Manag. Ecol.* 22, 279–285. doi: 10.1111/fme.12123

2.Affonso, A. G. (2012). Relação entre parâmetros ambientais e a densidade de pirarucu nos lagos de várzea de Mamirauá: uma análise multi-sensor. [doctoral thesis]. [São José dos Campos-SP]: Instituto Nacional de Pesquisas Espaciais, 163p.

3.Agostinho, C. S., Marques, E. E., Oliveira, R. J., and Braz, P. S. (2009). Feeding ecology of *Pterodoras granulosus* (Siluriformes, Doradidae) in the Lajeado Reservoir, Tocantins, Brazil. *Iheringia, Sér. Zool*.  99(3), 301-306. doi: 10.1590/S0073-47212009000300012

4.Anderson, J. T., Rojas, J. S., and Flecker, A. S. (2009.) High-quality seed dispersal by fruit-eating fishes in Amazonian floodplain habitats. *Oecologia* 161, 279–290. doi: 10.1007/s00442-009-1371-4

5.Araújo-lima, C. A. R. M. and Gomes, L. C. (2005). “Tambaqui (*Colossoma macropomum*)”, in Espécies nativas para piscicultura no Brasil, eds. B. Baldisserotto and L. C. Gomes (Santa Maria: UFSM), 175-202.

6.Arunachalam, M., Raja, M., Vijayakumar, C., Malaiammal, P., and Mayden, R. L. (2013). Natural History of Zebrafish (*Danio rerio*) in India. *Zebrafish* 10, 1-14. doi: 10.1089/zeb.2012.0803

7.Barthem, R. B., Goulding, M., Leite, R. G., Cañas, C., Forsberg, B. R, Venticique, E., et al. (2017). Goliath catfish spawning in the far western Amazon confirmed by the distribution of mature adults, drifting larvae and migrating juveniles. *Sci. Rep.* 7, 41784. doi: 10.1038/srep4178

8.Beltrão, H., Zuanon, J, and Ferreira, E. (2019). Checklist of the ichthyofauna of the Rio Negro basin in Brazilian Amazon. *ZooKeys* 881, 53-89. doi: 10.3897/zookeys.881.32055

9.Blanchfield, P. J., and Ridgway, M. S. (2005). The relative influence of breeding competition and habitat quality on female reproductive success in lacustrine brook trout (*Salvelinus fontinalis*). *Can. J. Fish.* *Aquat. Sci.* 62: 2694–2705. doi: 10.1139/F05-176

10.Bonfim, M., Martins, A. P. B., Carvalho, G. K. F. C, Piorski, N. M., and Nunes, J. L. S. (2017). Non-native mud sleeper *Butis koilomatodon* (Bleecker, 1849) (Perciformes: Eleotridae) in Eastern Amazon Coastal region: an additional occurrence for the Brazilian coast and urgency for ecological assessment. *Biol. Invasions Rec*. 6, 111-117. doi: 10.3391/bir.2017.6.2.04.

11.Brito, M. F. G., Pereira, M. S. A, and Figueiredo, C. A. A. (2013). *Poecilia sphenops* Valenciennes, 1846 (Cyprinodontiformes, Poeciliidae): New record in rio Sergipe basin, northeastern Brazil. *Check List* 9(5), 1129–1131. doi: 10.15560/9.5.1129

12.Campos-Baca, L., and Kohler, C. (2005). Aquaculture of *Colossoma macropomum* and Related Species in Latin America*. American Fisheries Society Symposium* 46, 451-561.

13.Carvajal-Vallejos, F. M., Bigorne, R., Fernandez, A. J. Z., Sarmiento, J., Barrera, S., Yunoki, T., et al. (2014). Fish-AMAZBOL: a database on freshwater fishes of the Bolivian Amazon. *Hydrobiologia* 732:1. doi: 10.1007/s10750-014-1841-5. doi: 10.3389/fendo.2013.00006

14.Castello, L. (2007). Lateral migration of *Arapaima gigas* in floodplains of the Amazon. *Ecol. Freshw. Fish*. 17, 38–46. doi: 10.1111/j.1600-0633.2007.00255.x

15.Castro, R. M. C., and Vari, R. P. (2004). Detritivores of the South America fish family Prochilodontidae (Teleostei: Ostariophysi: Characiformes): a phylogenetic and revisionary study. *Smithson. Contr. Zool.* 662, 1-189. doi: 10.5479/si.00810282.622

16.Chale F. M. (2004). Studies on the fisheries and biology of *Oreochromis urolepis* (Pisces: Cichlidae) in the Mtera reservoir (Tanzania). *Tanzania Journal of Science* 30, 33–40. doi: 10.4314/tjs.v30i2.18397

17.Clark, B. (2019). Biodiversity Risk and Benefit Assessment for Rainbow trout (*Oncorhynchus mykiss*) in South Africa. Department of Environment, Forestry and Fisheries. http://aquasea.csir.co.za/wp-content/uploads/2019/12/Appendix-C-1.1\_BRBA-Rainbow-Trout.pdf [Acessed April 09, 2020].

18.Copp, G. (2010). *Salvelinus fontinalis* (brook trout). *In: Invasive Species Compendium* Detailed coverage of invasive species threatening livelihoods and the environment worldwide. https://www.cabi.org/isc/datasheet/65325 [Accessed 9 April, 2020].

19.Daniels, A. (2019). *Xiphophorus maculatus*. The IUCN Red List of Threatened Species 2019: e.T191784A2003232. doi: 10.2305/IUCN.UK.2019-2.RLTS.T191784A2003232.en. [Acessed April 09, 2020].

20.Dias, A. C. M. I., Branco, C. C, and Lopes, V. G. (2005). Estudo da dieta natural de peixes no reservatório de Ribeirão das Lajes, Rio de Janeiro, Brasil. *Acta Sci. Biol. Sci.* 27(4), 355-364. doi: 10.4025/actascibiolsci.v27i4.1270

21.Duque, A. B., and Winemiller, K .O. (2003). Dietary segregation among large catfishes of the Apure and Arauca Rivers, Venezuela. *J.Fish Biol.* 63, 410–427. doi: 10.1046/j.1095-8649.2003.00163.x

22.Escobar, M. D., Farias, I. P., Thaphorn, D. C., Landines, M., and Hrbek, T. (2013). Molecular diagnosis of the arowanas *Osteoglossum ferreirai* Kanazawa, 1966 and *O. bicirrhossum* (Cuvier, 1829) from the Orinoco and Amazon River basins. *Neotrop. Ichthyol.* 11(2), 335-340. doi: 10.1590/S1679-62252013000200011

23.Espinola, L. A. (2005). tática reprodutiva e estrutura da população de *Cichla monoculus* Spix & Agassiz, 1831 (Perciformes, Cichlidae) em ambientes com diferentes regimes Hidrológicos. [master’s dissertation]. [Maringá - PR]: Pós-Graduação em Ecologia de Ambientes Aquáticos Continentais, Universidade Estadual de Maringá, 29p.

24.Farias, I., Leão, A., Almeida, Y. S., Verba, J. T., Crossa, M., Honczaryk, A., and Hrbek, T. (2015). Evidence of polygamy in the socially monogamous Amazonian fish *Arapaima gigas* (Schinz, 1822) (Osteoglossiformes, Arapaimidae). *Neotrop. Ichthyol.* 13, 195-204. doi: 10.1590/1982-0224-20140010.

25.Ferriz, R. A., Villar, C. A., Colautti, D., and Bonetto, C. (2000). Alimentacion de *Pterodoras granulosus* (Valenciennes) (Pisces, Doradidae) em la baja cuenca del Plata. *Res. Mus. Argentino Cienc. n. s. Nat.* 2(2), 151-156. doi: 10.22179/REVMACN.2.151

26.Figueredo, C. C., and Giani, A. (2005). Ecological interactions between Nile tilapia (*Oreochromis niloticus*, L.) and the phytoplanktonic community of the Furnas Reservoir (Brazil). *Freshw. Biol.* 50, 1391–1403. doi: 10.1111/j.1365-2427.2005.01407.x

27.Freitas, H. T. (2017) Caracterização de dieta alimentar de *Brycon hilarii* (Valenciennes, 1850) e sua relação com o pantanal na estação ecológica de Taiamã e área próxima na cidade de Cáceres-MT. [Monograph]. [Cáceres (MT)]: Universidade do Estado de Mato Grosso, 19p.

28.Froese, R., and Pauly, D. (2019). *Coptodon rendalli* Boulenger, 1897. FishBase. https://www.fishbase.de/summary/Coptodon-rendalli.html. [Acessed May 15, 2020].

29.Gárcia-Berthou, E. (2001). Size- and depth-dependent variation in habitat and diet of the common carp (*Cyprinus carpio*). *Aquat. Sci.* 63, 466-476. doi: 10.1007/s00027-001-8045-6

30.Geheber, A. D., McMahan, C. D., and Piller, K. R. (2010). First record of the non-native three spot gourami, *Trichogaster trichopterus* (Pallas 1770) (Teleostei: Osphronemidae) in Jamaica. *Aquatic Invasions* 5, S13-S16. doi: 10.3391/ai.2010.5.S1.004

31. Global Invasive Species Database. (2021) Species profile: *Micropterus salmoides*. http://www.iucngisd.org/gisd/species.php?sc=94 [Accessed 13 March, 2021].

32.Global Invasive Species Database. (2021). Species profile: *Oreochromis mossambicus*. http://www.iucngisd.org/gisd/species.php?sc=131 [Accessed 13 March, 2021].

33.Gold, J. R., and Gall, G. A. E. (1975). The taxonomic structure of six golden trout (*Salmo aguabonita*)populations from the Sierra Nevada, California (Pisces: Salmonidae). *Proc. Calif. Acad. Sci*. 40, 243-263.

34. Gonçalves, A. C. S., Murgas, L. D. S., et al. (2010). Desempenho produtivo de tambacus alimentados com dietas suplementadas com vitamina E. *Pesquisa Agropecuária Brasileira* 45(9), 1005-1011. [doi: 10.1590/S0100-204X2010000900010](https://dx.doi.org/10.1590/S0100-204X2010000900010)

35.Goulding, M., Barthem, R., Canas, C., Hidalgo, M., and Ortega, H. (2010). La Cuenca del río Inambari: Ambientes acuáticos, biodiversidad y represas. Lima, Peru: Wildlife Conservation Society.

36.Griffiths, D., Van Khanh, P., and Trong, T.Q. (2010) *Pangasius hypophthalmus. FAO Fisheries Division*. http://www.fao.org/fishery/culturedspecies/Pangasius\_hypophthalmus/en [Accessed April 15, 2020].

37.Hercos, A. P. (2014). Ecologia do acará-disco (S*ymphysodon aequifasciatus*, Pelegrin, 1904) (Perciformes: Cichlidae) em igarapés no lago Amanã, Amazonas, Brasil. [doctoral thesis]. [Manaus-AM]: Programa de Pós-Graduação em Biologia de Água Doce e Pesca Interior, 141p.

38.Hunt, J., Bacheler, N., Wilson, D., Videan, E., and Annett, C. (2002). “Enhancing largemouth bass spawning: behavioral and habitat considerations”, in Black Bass: Ecology, Conservation, and Management, eds D. P. Philipp, and M. S. Ridgway. (American Fisheries Society, Symposium 31, Bethesda, Maryland), 277-290.

39.Hutter, S., Penn, D. J., Magee, S., and Zala, S. M. (2010). Reproductive behaviour of wild zebrafish (*Danio rerio*) in large tanks. *Behaviour* 147, 641-660. doi: 10.1163/000579510X12632972473944

40.Imbiriba, E. P. (2001). Potencial de criação de pirarucu, *Arapaima gigas*, em cativeiro. *Acta Amazon.* 31(2), 299-316. doi: 10.1590/1809-43922001312316.

41.Ismail, W. A., and Clayton, D. A. (1990). Biology of *Omobranchus punctatus* (Blenniidae) on rocky shores on Kuwait. *Cybium* 14(4), 285-293.

42.Jones, L. A., Drake, D. A. R., Mandrak, N. E., Jerde, C. L., Wittmann, M. E., Lodge, D. M., et al. (2017). Modelling Survival and Establishment of Grass Carp, *Ctenopharyngodon idella,* in the Great Lakes Basin. *DFO Can. Sci. Advis. Sec. Res.* Doc. 2016/101 vi, 52 pp. https://waves-vagues.dfo-mpo.gc.ca/Library/40599590.pdf [Acessed 14 May, 2020].

43.Kamilov, B. G., and Komracova, M. Y. (1999). Maturation and fecundity of the silver carp, *Hypophtalmichthys molitrix* in Uzbekistan. *The Israeli journal of aquaculture*  51(1): 40-43. https://www.researchgate.net/publication/235663959\_Maturation\_and\_fecundity\_of\_the\_silver\_carp\_Hypophtalmichthys\_molitrix\_in\_Uzbekistan [Accessed 17 May, 2020]

44.Kullander, S. O., and Ferreira, E. J. G. (2006). A review of the South American cichlid genus *Cichla*, with descriptions of nine new species (Teleostei: Cichlidae). *Ichthyol. Explor. Freshwaters.* 17(4), 289-398.

45.Labonne J., Vignon, M., Prévost, E., Lecomte, F., Dodson, J. J, Kaeuffer, R., et al. (2013). Invasion Dynamics of a Fish-Free Landscape by Brown Trout (*Salmo trutta*). *PloS ONE* 8(8), e71052. doi: 10.1371/journal.pone.0071052

46.Lamboj, A. (2004). The cichlid fishes of Western Africa. Bornheim, Germany: Birgit Schmettkamp Verlag. 256p.

47.Lasso-Alcalá, O., Nunes, J. L. S., Lasso, C., Posada, J., Robertson, R., Piorski, N.M., et al. (2011). Invasion of the Indo-Pacific blenny *Omobranchus punctatus* (Perciformes: Blenniidae) on the Atlantic Coast of Central and South America. *Neotrop. Ichthyol.* 9(3), 571-578. doi: 10.1590/S1679-62252011000300010

48.Loubens, G., and Osorio. F. (1991). “*Basilichthys bonariensis* (Pejerrey)", in Especies introducidas. El lago Titicaca. Síntesis del conocimiento limnológico actual, eds. C. Dejoux and A. Iltis (La Paz, Bolivia: ORSTOM/HISBOL), 431-449.

49.Low, B. W., and Lim, K. (2012). Gouramies of the genus *Trichopodus* in Singapore (Actinopterygii: Perciformes: Osphronemidae). *NATURE IN SINGAPORE* 5, 83–93. https://lkcnhm.nus.edu.sg/wp-content/uploads/sites/10/app/uploads/2017/06/2012nis083-093.pdf [Accessed 13 May, 2020].

50.Macieira, R. M., Giarrizzo, T., Gasparini, J. L., and Sazima, I. (2012). Geographic expansion of the invasive mud sleeper *Butis koilomatodon* (Perciformes: Eleotridae) in the western Atlantic Ocean. *J. Fish. Biol.* 81, 308-313. doi: 10.1111/j.1095-8649.2012.03285.x

51.Magalhães, A. L. B., and Jacobi, C. M. (2013). Invasion risks posed by ornamental freshwater fish trade to southeastern Brazilian rivers. *Neotrop. Ichthyol.* 11(2), 433-441. doi: 10.1590/S1679-62252013005000003

52.Magalhães, A. L. B., and Jacobi, C. M. (2017). Colorful invasion in permissive neotropical ecosystems: establishment of ornamental non-native poeciliids of the genera *Poecilia*/*Xiphophorus* (Cyprinodontiformes: Poeciliidae) and management alternatives. *Neotrop. Ichthyol.* 15(1), e160094. doi: 10.1590/1982-0224-20160094

53.Maiztegui, T., Baigún, C. R. M., Garcia de Souza, J. R., Minotti, P., and Colautti, D. C. (2016). Invasion status of the common carp *Cyprinus carpio* in inland waters of Argentina. *J. Fish Biol.* 89. doi: 10.1111/jfb.13014

54.Melo, B. F., Sidlauskas, B. L., Hoekzema, K., Frable, B. W., Vari, R. P., and Oliveira, C. (2016). Molecular phylogenetics of the Neotropical fish family Prochilodontidae (Teleostei: Characiformes). *Mol. Phylogenetics Evol*. 102, 189-201. doi: 102. 10.1016/j.ympev.2016.05.037.

55.Montag, L. F. A., Freitas, T. M. S., Raiol, R. D. O., and Silva, M. V. (2011). Length-weight relationship and reproduction of the guppy *Poecilia reticulata* (Cyprinodontiformes: Poeciliidae) in urban drainage channels in the Brazilian city of Belém. *Biota Neotrop.* 11(3), 93-97. doi: 10.1590/S1676-06032011000300007

56.Monteiro, V., Benedito, E., and Domingues, W. M. (2007). Efeito da estratégia de vida sobre as variações no conteúdo de energia de duas espécies de peixes (*Brycon hilarii* e *Hypophthalmus edentatus*), durante o ciclo reprodutivo. *Acta Sci. Biol. Sci.* 29(2), 151-159. doi: 10.4025/actascibiolsci.v29i2.521

57.Moor, F. C., Wilkinson, R. C. and Herbst, H. M. (1986) Food and feeding habits of *Oreochromis mossambicus* (Peters) in hypertrophic Hartbeespoort Dam, South Africa. *South African Journal of Zoology* (21)2, 170-176, doi: 10.1080/02541858.1986.11447976

58.Moresco, A., and Bemvenuti, M. (2006). Biologia reprodutiva do peixe-rei *Odontesthes argentinensis* (Valenciennes) (Atherinopsidae) da região marinha costeira do sul do Brasil. *Rev. Bras. Zool.* 23(4), 1168-1174. doi: 10.1590/S0101-81752006000400025

59.Moura, P. S., Moreira, R. L., Teixeira, E. G., Moreira, A. G. L., Lima, F. R. S., and Farias, W. R. L. (2011). Desenvolvimento larval e influência do peso das fêmeas na fecundidade da tilápia do Nilo. *Rev. Bras. Ciênc. Agrár.* 6(3), 531-537. doi: 10.5039/agraria.v6i3a1396

60.Navarro, M. P., Affonso, I. P., and Delariva, R. L. (2007). Morfologia trófica de *Poecilia reticulata* (Peters, 1859) em dois riachos urbanos do município de Maringá, PR. V Encontro Internacional de Produção Científica Cesumar. Maringá -PR. https://www.unicesumar.edu.br/epcc-2007/wp-content/uploads/sites/87/2016/07/milena\_predin\_navarro.pdf [Acessed March 15, 2020].

61.Olivares, A., Hrbek, T., Escobar Lizarazo, M., and Caballero, S. (2013). Population structure of the black arowana (*Osteoglossum*

*ferreirai*) in Brazil and Colombia: Implications for its management. *Conserv. Genet.* 14, 695-703. doi: 10.1007/s10592-013-0463-1.

62.Oliveira, T. D., Reis, A. C., Guedes, C. O, Sales, M. L., Braga, E. P. R., Ratton, T. F., et al. (2014). Establishment of non-native guppy *Poecilia reticulata* (Peters, 1859) (Cyprinodontiformes: Poeciliidae) in an Municipal Park located in Minas Gerais State, Brazil. Pan-Am. *J. Aquat. Sci*. 9(1), 21-30.

63.Ortega, H., Guerra, H., and Ramirez, R. (2007). “The Introduction of Nonnative Fishes into Freshwater Systems of Peru” in Ecological and Genetic Implications of Aquaculture Activities. *Methods and Technologies in Fish Biology and Fisheries*, vol 6, ed. T. M. Bert. (Dordrecht: Springer). doi: 10.1007/978-1-4020-6148-6\_14

64.Van Damme, P. A., Méndez, C. C., Zapata, M., Carvajal-Vallejos, F. M., Carolsfeld, J., and Olden, J. D. (2015). The expansion of *Arapaima* cf. *gigas* (Osteoglossiformes: Arapaimidae) in the Bolivian Amazon as informed by citizen and formal science. *Manag. Biol. Invasions*. 6(4), 375-383 doi: 10.3391/mbi.2015.6.4.06

65.Palmer-Newton, A. (2019). *Xiphophorus variatus*. *The IUCN Red List of Threatened Species* 2019: e.T191792A2003290. https://dx.doi.org/10.2305/IUCN.UK.2019-2.RLTS.T191792A2003290.en [Accessed 9 April, 2020].

66.Pelicice, F. M., Vitule, J. R. S., Lima, D., Orsi, M. L, and Agostinho, A. A. (2014). A serious new threat to Brazilian freshwater ecosystems: the naturalization of nonnative fish by decree. *Conserv. Lett.* 7(1), 1-6. doi: 10.1111/conl.12029

67.Piedras, S. R. N., and Pouey, J. L. O. F. (2005). Alimentação do peixe-rei (*Odontesthes bonariensis*, Atherinopsidae) nas lagoas Mirim e Mangueira, Rio Grande do Sul, Brasil. *Iheringia, Sér. Zool*. 95(2), 117-120. doi: 10.1590/S0073-47212005000200001

68.Popma, T. J., and Green, B. W. (1990). Sex reversal of tilapia in earthen ponds. International Center for Aquaculture and Aquatic Environments, Department of Fisheries and Allied Aquacultures. Auburn University, Alabama, 15p.

69.Pyke, G. H. (2005). A review of the biology of *Gambusia affinis* and *G. holbrooki*. *Rev. Fish Biol. Fish.* 15, 339-365. doi: 10.1007/s11160-006-6394-x

70.Queiroz, H. L., and Camargo, M. (2008). Biologia, conservação e manejo dos Aruanãs na Amazônia Brasileira. Tefé: IDSM. 152.p.

71.Rawat, M. S., Bantwan, B., and Singh, D. (2017). Study on the fecundity of brown trout (*Salmo trutta fario* L*.*) in River Asiganga, Uttarkashi (Uttarakhand), India. *Int. J. Fish. Aquat. Stud.* 5(1), 167-172. http://www.fisheriesjournal.com/archives/?year=2017&vol=5&issue=1&part=C&ArticleId=1059 [Acessed April 15, 2020].

72.Reed, B., and Jennings, M. (2011). Guidance on the housing and care of Zebrafish *Danio rerio*. England: RSPCA. 62p.

73.Reis, R. E., Kullander, S. O., and Ferraris, C. J. (2003). Check list of the freshwater fishes of South and Central America. Porto Alegre: EDIPUCRS. 742 p.

74.Restrepo-Santamaría, D., and Álvarez-León, R. (2013). Algunos aspectos sobre la introducción de especies, y estado del conocimiento sobre los peces introducidos en el departamento de Caldas, Colombia. *Revista luna azúl* 37, 268-281. http://www.scielo.org.co/scielo.php?script=sci\_arttext&pid=S1909-24742013000200016&lng=en&nrm=isso [Acessed July 16, 2020].

75.Reys, P., Sabino, J., and Galetti, M. (2008). Frugivory by the fish *Brycon hilarii* (Characidae) in western Brazil. *Acta Oecol.* 35(1), 136-141. doi: 10.1016/j.actao.2008.09.007

76.Riesch, R., Reznick, D. N., Plat, M., and Schlupp, I. (2016). Sex-specific local life-history adaptation in surface- and cavedwelling Atlantic mollies (*Poecilia mexicana*). *Sci. Rep*. 6, 22968. doi: 10.1038/srep22968

77.Rodrigues-Filho, C. A. S. Gurgel-Lourenço, R. C., and Sánchez-Botero, J. I. (2018). First report of the alien species *Trichopodus trichopterus* (Pallas, 1770) in the state of Ceará, Brazil. *Braz. J. Biol*. 78 (2), 394-395. doi: 10.1590/1519-6984.170472

78.Sánchez-Hernández, J., Servia, M. J., Vieira-Lanero, R., and Cobo, F. (2012). Ontogenetic Dietary Shifts in a Predatory Freshwater Fish Species: The Brown Trout as an Example of a Dynamic Fish Species, New Advances and Contributions to Fish Biology, Hakan Türker, *IntechOpen* 271-298. doi: 10.5772/54133

79.Santana, T. C., Barbosa, J. M., Silva, A. L. S., Lindoso, A. L. P., Sousa, E. F., and Teixeira, E. G. (2017). First record of *Heterotilapia buttikoferi* (Hubrecht, 1881) (Perciformes, Cichlidae), from Pentecoste, state of Ceará, Brazil. *Acta Fish. Aquat. Res.* 5 (3): 7-11. doi: 10.2312/ActaFish.2017.5.3.vii-xi

80.Santos, L. N., Gonzalez, A. F., and Araújo, F. G. (2001). Dieta do tucunaré-amarelo *Cichla monoculus* (Bloch & Schneider) (Osteichthyes, Cichlidae), no Reservatório de Lajes, Rio de Janeiro, Brasil. *Revta. bras. Zool*. 18(11), 191-204. doi: 10.1590/S0101-81752001000500015.

81.Schmitter-Soto, J. J. (1998). Catálogo de los peces continentales de Quintana Roo. Roo, México: Guías Científicas Ecosur. 239p.

82.Singh, N., and Gupta, P. K. (2010). Food and Feeding Habits of an Introduced Mosquitofish, *Gambusia holbrooki* (Girard) (Poeciliidae) in a Subtropical Lake, Lake Nainital, India. *Asian Fisheries Science* 23, 355-366. doi: 10.33997/j.afs.2010.23.3.007

83.Sivakumaran, K. P, Brown, P., Stoessel, D., and Giles, A. (2003). Maturation and reproductive biology of female wild carp, *Cyprinus carpio*, in Victoria, Australia. *Environ. Biol. Fishes*.68, 321–332. doi: 10.1023/A:1027381304091

84.Smith, W. S., Biagioni, R. C., and Halcsik, L. (2013). Fish fauna of Floresta Nacional de Ipanema, São Paulo State, Brazil. *Biota Neotrop.* 13(2), 175-181. doi: 10.1590/S1676-06032013000200016

85.Soares, B. E., Raiol., R. D. O., and Montag, L. F. A. (2011). Occurrence of the non-native blenny *Omobranchus punctatus* (Valenciennes, 1836) (Perciformes: Blenniidae) in the Amazon coastal zone, *Brazil. Aquat. Invasions.* 6(1), S39–S43. doi: 10.3391/ai.2011.6.S1.009

86.Souza, F. H. S., Perez, M. F., Bertollo, L. A., Oliveira, E. A., Lavoué, S., Gestich, C. C., et al. (2019). Interspecific Genetic Differences and Historical Demography in South American Arowanas (Osteoglossiformes, Osteoglossidae, O*steoglossum*). *Genes* 10, 693. doi: 10.3390/genes10090693

87.Taylor, G. C., Hill J. M., and Weyl O. L. F. (2019) The diet and trophic ecology of non-native *Micropterus salmoides* in two South African impoundments. *African Journal of Aquatic Science* 44(2), 143-153. doi: 10.2989/16085914.2019.1612318

88.Testahun, A., and Temesgen, M. (2018). Food and feeding habits of Nile tilapia *Oreochromis niloticus* (L.) in Ethiopian water bodies: A review. *Int. J. Fish. Aquat. Stud*. 6(1), 43-47. http://www.fisheriesjournal.com/archives/?year=2018&vol=6&issue=1&part=A&ArticleId=1455 [Acessed April 16, 2020].

89.Thomas, C., Bonner, T., Whiteside, B. G., and Gelwick, F. (2007). Freshwater fishes of Texas: A field guide. Texas State University. 202p.

90.Tobler, M. (2005). Feigning death in the Central American cichlid *Parachromis friedrichsthalii. Journal of Fish Biology* 66, 877–881*.*doi:10.1111/j.0022-1112.2005.00648.x

91.Töpfer, J., and Schindler, I. (2009). On the type species of *Trichopodus* (Teleostei: Perciformes: Osphronemidae). *Vertebrate Zoology* 59(1), 49-51.

92.Townsend, C. R. (1996). Invasion biology and ecological impacts of brown trout *Salmo trutta* in New Zealand. *Biol. Conserv*. 78, 3-22. doi: 10.1016/0006-3207(96)00014-6

93.Trewavas, E. (1984). Tilapiine fishes of the genera *Sarotherodon*, *Oreochromis* e *Danakilia*. *London: Natural History Museum Library*. doi: 10.5962/bhl.title.123198

94.Ulotu, E. E., Mmochi, A. J., and Lamtane, H. A. (2016) Effect of Salinity on the Survival and Growth of Rufiji Tilapia (*Oreochromis urolepis urolepis*) Fry. *WIO Journal of Marine Science* 15(2), 31-37. https://www.ajol.info/index.php/wiojms/article/view/141666 [Acessed May 27, 2020].

95.Uusi-Heikkilä, S., Böckenhoff, L., Wolter, C., and Arlinghaus, R. (2012). Differential Allocation by Female Zebrafish (*Danio rerio*) to Different-Sized Males - An Example in a Fish Species Lacking Parental Care. *PLoS ONE* 7(10), e48317. doi: 10.1371/journal.pone.0048317

96.Vásquez-Torrez, W. A. (2005). “Pirapitinga: reprodução e cultivo” in Espécies nativas para piscicultura no Brasil, eds. B. Baldisserotto and L. C. Gomes (Santa Maria: UFSM), 203 –224.

97.Vazzoler, A. E. A. de M. (1996). Biologia e reprodução de peixes teleósteos: teoria e prática. Maringá: EDUEM. 169p.

98.Velásquez-Medina, S. (2008). Criopreservação do sêmen de pirapitinga, *Piaractus brachypomus* (Pisces, Characidae). [master’s dissertation]. [Fortaleza-CE]: Universidade Federal do Ceará, Instituto de Ciências do Mar, 93p.

99.Vieira, E. F., Isaac, V. J., and Fabré, N. N. (1999). Biologia reprodutiva do Tambaqui, *Colossoma macropomum* Cuvier, 1818 (Teleostei, Serrasalmidae), no Baixo Amazonas, Brasil. *Acta Amazon*. 29(4), 625-638. doi: 10.1590/1809-43921999294638.

100. Weinersmith, K., Colombano, D., Bibian, A., Young, M.; Sih, A., and Conrad, J. L. (2019). Diets of Largemouth Bass (*Micropterus salmoides*) in the Sacramento San Joaquin Delta*. San Francisco Estuary and Watershed Science* 17(1), 1-16. doi: 10.15447/sfews.2019v17iss1art3

101.Welcome, R. L. (1988). International introductions of inland aquatic species. FAO - Fisheries Technical Paper. http://www.fao.org/3/X5628E/x5628e0c.htm#odontesthes%20bonariensis%20(cuvier%20and%20vaunciennes):%20atherinidae [Acessed July 31, 2020].

102. Woodford, D. J., and Impson, N. D. (2004). A preliminary assessment of the impact of alien rainbow trout (*Oncorhynchus mykiss*) on indigenous fishes of the upper Berg River, Western Cape Province, South Africa. *African Journal of Aquatic Science* 29(1), 107–111. doi: 10.2989/16085910409503799

103.Woynarovich, E. (1988). Tambaqui e pirapitinga. Propagação artificial e criação de alevinos. Brasília: Ministério da Irrigação e CODEVASF. 68p.

104. Yang, N. (2005). Cultured Aquatic Species Information Programme. *Hypophthalmichthys molitrix.* Cultured Aquatic Species Information Programme. *In*: FAO Fisheries and Aquaculture Department. http://www.fao.org/fishery/culturedspecies/Hypophthalmichthys\_molitrix/en [Accessed 9 April, 2020].

105. Zaganini, R. L. (2009). Caracterização do regime alimentar de *Oreochromis niloticus* (Linnaeus, 1758) e *Tilapia rendalli* (Boulenger, 1897) na represa de Barra Bonita, Médio Rio Tietê, SP. [master’s dissertation]. [Botucatu - SP]: Universidade Estadual Paulista, Instituto de Biociencias. 68p.

106.Zalinge, N. P., Lieng, S., Ngor, P. B., Heng, K., and Valbo-Jørgensen, J. (2002). Status of the Mekong *Pangasianodon hypophthalmus* resources, with special reference to the stock shared between Cambodia and Viet Nam. MRC Technical Paper, 1, 1-29.