

Some considerations regarding the online trade of Poeciliid fishes in Romania

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Abstract. Poeciliid fishes are among the most spread aquarium fish. For this study we surveyed 8 online pet shops who sell Poeciliid species, finding 23 species included in 10 genera. The most frequent species were *Poecilia reticulata*, *Poecilia sphenops*, *Xiphophorus maculatus* and *Xiphophorus hellerii*. The fishes are both imported or locally breed. The prices for fish specimens are high for the rare and very species and even for some strains of more common ones, but are still affordable for an average consumer.

Key words: tropical fish trade, livebearer, importer, retailer, strain.

Introduction. Humans were interested in keeping ornamental fish in their homes from ancient times (Kaszony 1970; Khan & Sadovy 1999; Bud et al 2005). The freshwater aquarium, and later the marine aquarium became a popular and educational activity for humans of all ages, aquarium keeping being amongst the most popular of hobbies with millions of enthusiasts' world wide (Ukaonu et al 2011; Petrescu-Mag et al 2013), especially among city dwellers (Cheong 1996).

The trade in ornamental fish and aquarium supplies is a multi-million dollar industry worldwide (Dykman 2012). More than 100 countries are involved in the trade of ornamental fish, approximately 1 billion ornamental fish being exported annually (Cheong 1996; Goswami & Zade 2015). The majority of exporting countries involved in the trade of ornamental fish are developing countries in South America and Asia (Whittington et al 2000; Moore & Best 2001; Shuman et al 2004; FAO 2006; OATA 2015, 2016). The trade involves more than 1000 species (Cheong 1996; Livengood & Chapman 2009; Rhyne et al 2012; Lee 2014) of which around 90-96% are of freshwater origin and are produced in commercial aquaculture facilities (Chapman et al 1997; Cato & Brown 2003; Livengood & Chapman 2009).

Aquarium hobbyists and public aquariums buy fishes from retailers or occasionally directly from wholesalers (Wabritz et al 2003). Internet stores have made the retailing process easier for consumers, more and more purchases being made online, but the problem is the online retailers rarely provide information about their live stocks origin and collecting methods in case of wild-caught specimens (McCollum 2007).

One of the main freshwater fish families kept in aquariums is Poeciliidae, covering a wide range from the southeastern United States to northeastern Argentina (Nelson 2006). Out of more than 250 recognized species in more than 30 genera (Froese & Pauly 2016; Eschmeyer et al 2016), four species are by far the most frequent among the fish hobbyists: *Poecilia reticulata*, *Poecilia sphenops*, *Xiphophorus hellerii* and *Xiphophorus maculatus* (www.fishnet.org; Hellweg 2014).

In this paper we made a survey on all the Romanian websites we could find selling poeciliid fishes online.

Material and Method. We did a two months survey (mid July - mid September 2016) of online Romanian pet shops who sell, among others, poeciliid fish species. In the present paper we agreed not to provide any online pet shop name or website, but it is not difficult to find them all taking into account the information we provide within the paper.

Results and Discussion. During the survey we were able to find dozens of online pet shops who sell all kinds of aquarium tools and fish feed, but there were only few pet shops selling live fish as well. Two of them sell discus only (*Symphysodon aequifasciatus* and *S. discus*), so we did not include them in our study. After that only 8 online pet shops selling Poeciliid fishes remained. We noted the pet shops from A to H and they will be briefly described below and in Table 1 as well.

The first pet shop (A) is located in Bucharest and has only imported fish. The prices for fish are not available on the website. The second pet shop (B) is located in Cluj-Napoca and also has only imported fish, having the prices posted on the website. There are many Poeciliid species available, but they do not sell fish online during the cold season. The third pet shop (C) is located in Constanta, it does not provide on the website the fish source and prices. The 4th pet shop (D) is located in Sibiu, no prices on the website, the fishes are locally breed, they also export the fishes. The 5th pet shop is located in Timisoara, no information regarding the fish origin (imported or locally breeds), the prices are available on the website. They do not sell fish online during the cold season. The 6th pet shop is located in Pantelimon (Ilfov), having the greatest offer of Poeciliid fishes among the all pet shops surveyed. Most of the fishes are rare or very rare species, all imported from Germany. The prices are available on the website. The 7th pet shop, located in Dobroesti (Ilfov) sells only guppies (*P. reticulata*), and provides the prices on the website. The 8th and final pet shop is located in Nojorid (Bihor), sells exclusively locally produced fishes, has no prices available on the website.

According to Table 1, there were 23 Poeciliid species in 10 genera available overall: one species for pet shop G; 4 species for pet shops C, D and H respectively; 5 species for pet shop E; 6 species for pet shop A; 13 species for pet shop B; and 21 species for pet shop F. The species *P. reticulata* has the biggest share, being available on all the 8 pet shops, followed by *Poecilia sphenops*, *Xiphophorus hellerii* and *Xiphophorus maculatus* which are available in 7 pet shops. *Poecilia latipinna*, *Poecilia wingei* and *Xiphophorus variatus* are available in 3 pet shops. Then, the following species are available in 2 pet shops: *Girardinus falcatus*, *Limia nigrofasciata*, *Poecilia salvatoris*, and *Poecilia velifera*. Finally, the following species can be purchased only from one pet shop: *Alfaro cultratus*, *Girardinus metallicus*, *Heterandria formosa*, *Limia melanogaster*, *Limia perugiae*, *Micropoecilia picta*, *Neoheterandria elegans*, *Phallichthys amates*, *Phalloceros caudimaculatus*, *Poecilia kykesis*, *Poecilia parae* and *Xiphophorus evelynae*.

We have remarked that all the pet shops provided the valid names for all the species, with few exceptions only. Thus, *Poecilia parae* was written as *Micropoecilia parae*, which is no longer a valid scientific name (Lucinda et al 2011); a common mistake is using the name *X. helleri* by all the pet shops, instead of *X. hellerii*, which is the present valid name, according to Fricke (1999). Another misspelling is using *X. maculates* instead of *X. maculatus* in one case. A common mistake is to assign the balloon mollies to *P. latipinna* instead of *P. sphenops*.

Concerning the *Xiphophorus* species, there are dozens of strains available in these pet shops, but we suspect that part of them are hybrids between *X. hellerii* x *X. maculatus*, *X. hellerii* x *X. variatus* or *X. maculatus* x *X. variatus*. If we talk about *P. reticulata*, there are more than 80 strains available. As usual for imported fish, for pure breeds only males are available.

Regarding the prices for fish specimens, especially the rare species are quite expensive, the highest price being in the case of *P. kykesis*. Some breeds of *X. hellerii*, *P. velifera*, *P. wingei* and even *P. reticulata* could be also expensive (Table 1).

Table 1

Poeciliid fish species found in the online pet shops in Romania

No.	Species	Online petshop (fish price in RON [@])								Observations
		A	B	C	D	E	F	G	H	
1	<i>Alfaro cultratus</i>		14							
2	<i>Girardinus falcatus</i>		16				13			
3	<i>Girardinus metallicus</i>						12			
4	<i>Heterandria formosa</i>						14			
5	<i>Limia melanogaster</i>						12			
6	<i>Limia nigrofasciata</i>		10				13			
7	<i>Limia perugiae</i>						16			
8	<i>Micropoecilia picta</i>						14-16			
9	<i>Neoheterandria elegans</i>		22							
10	<i>Phallichthys amates</i>						15			
11	<i>Phalloceros caudimaculatus</i>						13			
12	<i>Poecilia kykesis</i>						70			
13	<i>Poecilia latipinna</i>		9-12*			8-14	7			*4 strains
14	<i>Poecilia parae</i>						15			
15	<i>Poecilia reticulata</i>	x	8-9	x	x	6-8*	4-14**	3-6	x	*17 strains (males only for pure strains, mixed females); **83 strains (males only for pure strains, mixed females)
16	<i>Poecilia salvatoris</i>		21				15			
17	<i>Poecilia sphenops</i>	x	6-14	x	x	3-10	7-20*		x	*8 strains
18	<i>Poecilia velifera</i>		13-25*				9-20**			*3 strains; **4 strains
19	<i>Poecilia wingei</i>	x	15				7-20*			*8 strains
20	<i>Xiphophorus evelynae</i>						21			
21	<i>Xiphophorus hellerii</i>	x	6-21*	x	x	4-10	7-30**		x	*10 strains; **28 strains
22	<i>Xiphophorus maculatus</i>	x	5-10*	x	x	6-12	8-12**		x	*12 strains; **32 strains
23	<i>Xiphophorus variatus</i>	x	7-13				6-8*			*5 strains

[@] We used the exchange rate of Romanian National Bank: 1 USD = 4.20 RON; X - present.

Apart from the pet shops mentioned in Table 1, there are also few advertisement websites, where common people can sell the aquarium fish. The most common such websites are: olx.ro; okazii.ro; publi24.ro. There are also some fish selling advertisements on social media as facebook and sunphoto.ro. The most common species on all these websites is *P. reticulata*, followed by *X. hellerii*, *P. sphenops* and *X. maculatus*. In a previous study we also noted that the above mentioned four species are the most frequent in regular Romanian pet shops (Gavriloaie et al 2016). These four species are also the most frequent among Poeciliid fishes sold in USA (Hill & Yanong 2016), Singapore, Japan and Europe (Cheong 1996).

Conclusions. We have surveyed 8 online pet shops who sell Poeciliid species. We found 23 species available, in 10 genera, the most frequent being *P. reticulata*, *P. sphenops*, *X. hellerii*, and *X. maculatus*. The fishes are both imported from Asian countries and Germany and are also local breeds. The prices for the rare species are quite high but still affordable for an average consumer.

References

- Bud I., Vladau V. V., Pop N. S., 2005 Acvaristica – mica enciclopedie. Ed Risoprint, Cluj-Napoca, ISBN973-751-369-0. [in Romanian]
- Cato J. C., Brown C. L., 2003 Marine ornamental species: collection, culture, and conservation. Iowa State Press, Ames, Iowa, 395 pp.
- Chapman F.A., Fitz-Coy S. A., Thunberg E. M., Adams C. M., 1997 United States of America trade in ornamental fish. Journal of the World Aquaculture Society 28: 1-10.
- Cheong L., 1996 Overview of the current international trade in ornamental fish, with special reference to Singapore. Revue Scientifique et Technique 15(2): 445-481.
- Dykman M., 2012 The environmental and economic benefits of eco-certification within the ornamental fish trade. International Journal of Trade, Economics and Finance 3(1): 1-6.
- Eschmeyer W. N., Fricke R., van der Laan R. (eds), 2016 Catalog of fishes: genera, species, references. Available at: <http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp>. Accessed: August, 2016.
- FAO, 2006 State of world aquaculture 2006. FAO Fisheries Technical Paper. No. 500, Rome, FAO, 134 pp.
- Fricke R., 1999 Fishes of the Mascarene Islands (Réunion, Mauritius, Rodriguez): an annotated checklist, with descriptions of new species. Koeltz Scientific Books, Koenigstein, Theses Zoologicae, Vol. 31, 759 pp.
- Froese R., Pauly D., 2016 FishBase. Available at: <http://www.fishbase.org>. Accessed: August, 2016.
- Gavriloaie C., Gavriloaie S. C., Petrescu-Mag I. V., Botha M., 2016 Poeciliid fishes on Romanian aquarium fish market. Poec Res 6(1): 10-15.
- Goswami C., Zade V. S., 2015 Analysis of international trade and economical and commercial scope of ornamental fishes. International Journal of Engineering and Applied Sciences 2(5): 36-40.
- Hellweg M., 2014 Livebearers - more than just the "Big Four". In: Tropical Fish Hobbyst Magazine. Available at: <http://www.tfhmagazine.com/details/articles/livebearersmore-than-just-the-big-four-full-article.htm>. Accessed: August, 2016.
- Hill J. E., Yanong R. P. E., 2016 Freshwater ornamental fish commonly cultured in Florida. Institute of Food and Agricultural Science, University of Florida, Gainesville, FL, 5 pp.
- Kászoni Z., 1970 [Acvaristica]. Scientific Publishing House, Bucharest, 282 pp. [in Romanian].
- Khan T. T. C., Sadovy I., 1999 Profile of the marine aquarium fish trade in Hong Kong. Aquarium Sciences and Conservation 2: 197-213.

- Lee J. J., 2014 Do you know where your aquarium fish come from? National Geographic, July, 2014.
- Livengood E. J., Chapman F. A., 2009 The ornamental fish trade: an introduction with perspective for responsible aquarium fish ownership. Institute of Food and Agricultural Science, University of Florida, Gainesville, FL, 7 pp.
- Lucinda P. H. F., Figueiredo C. A., Hartel K. E., 2011 Designation of the lectotype of *Poecilia amazonica* Garman, 1895 (Cyprinodontiformes, Poeciliidae) and discussion of its nomenclatural status. *Zootaxa* 2751:63-64.
- McCullum B. A., 2007 Consumer perspectives on the "web of causality" within the marine aquarium fish trade. *SPC Live Reef Fish Information Bulletin* 17:20-30.
- Moore F., Best B., 2001 Coral reef crisis: causes and consequences. Presented at the Annual Meeting of the American Association for the Advancement of Science, San Francisco, California, February 19.
- Nelson J. S., 2006 *Fishes of the World*. 4th ed. Hoboken (New Jersey, USA): John Wiley & Sons, 601 pp.
- OATA (Ornamental Aquatic Trade Association), 2015 European ornamental fish import and export statistics: 2014. Wiltshire, United Kingdom, 7 pp.
- OATA (Ornamental Aquatic Trade Association), 2016 European ornamental fish import and export statistics: 2015. Wiltshire, United Kingdom, 9 pp.
- Petrescu-Mag R. M., Pășărin B., Șonea C. G., Petrescu-Mag I. V., 2013 Customer preferences and trends for aquarium fish in Transylvania (Romania). *North-Western Journal of Zoology* 9(1):166-171.
- Rhyne A. L., Tlustý M. F., Schofield P. J., Kaufman L., Morris J. A. Jr., Bruckner A. W., 2012 Revealing the appetite of the marine aquarium fish trade: the volume and biodiversity of fish imported into the United States. *PLoS ONE* 7(5):e35808.
- Shuman C. S., Hodgson G., Ambrose R. F., 2004 Managing the marine aquarium trade: is eco-certification the answer? *Environmental Conservation* 31:339-348.
- Ukaonu S. U., Mbawuike B. C., Oluwajoba E. O., Williams A. B., Ajuonu N., Omogoriola H. O., Olakolu F. C. Adegbile O. M., Myade E. F., 2011 Volume and value of ornamental fishes in the Nigerian export trade. *Agriculture and Biology Journal of North America* 2(4):661-664.
- Wabritz C., Taylor M., Green E., Razak T., 2003 *From ocean to aquarium: the global trade in marine ornamental species*. Cambridge, UK: UNEP World Conservation Monitoring Centre, 64 pp.
- Whittington M., Pereira M. A. M., Goncalves M., Costa A., 2000 An investigation of the ornamental fish trade in Mozambique. Phase I: Information macrodiagnostic and project appraisal. A Report for the Coastal Management Unit – MICOA, Maputo, 33 pp.
- *** <http://www.fishnet.org/keeping-fish/Livebearers.htm>. Accessed: August, 2016.

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