7(2): 114-120 (2013) DOI: 10.3153/jfscom.2013012

Journal of FisheriesSciences.com

E-ISSN 1307-234X

SHORT COMMUNICATION KISA BİLGİLENDİRME

PARASITES ON DIFFERENT ORNAMENTAL FISH SPECIES IN TURKEY

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Abstract: Different ornamental fish species, astronot *Astronotus ocellatus* (n=3), goldfish *Carassius auratus* (n=11), discus *Symphsodon discus*, (n=3), beta **Betta** *splendens*, (n=2), guppy *Poecilia reticulata*, (n=5), convict cichlid *Cichlasoma nigrofasciatum*, (n=13), blue streak hap *Labidochromis caeruleus*, (n=8), angelfish *Pterophyllum scalare*, (n=2), black molly *Poecilia sphenops*, (n=3) and severum *Heros efasciatus*, (n=5) were sampled from Turkey between 2009 and 2010. *Dactylogyrus* sp., *Gyrodactylus* sp. (Monogenea), *Epistylis* sp. *Chilodonella cyprini*, *Ichthyophthirius multifiliis*, *Tetrahymena* sp., *Trichodina* spp., *Vorticella* sp. (Ciliates), *Hexamita* sp., *Ichthyobodo necator* (flagellates) and *Piscinoodinium pillulare* (Dinoflagellate) were identified from those sampled fish. *I. multifiliis*, *I. necator* and *Trichodina* spp. were observed as highest prevalence (16.36%) in all parasites. From a total 55 examined fishes, 50 (90.90%) fish were parasitized. *Vorticella* sp. was reported as a first record from the gills of *Cichlasoma nigrofasciatum* and also *Piscinoodinium pillulare* was reported for the first time from *Betta splendens* in the country.

Keywords: Aquarium, Infestation, *Piscinoodinium pillulare*, prevalence, *Vorticella* sp

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Özet: **Türkiye'nin Değişik Süs Balık Türlerindeki Parazitler**

Türkiye'de 2009 ve 2010 yılları arasında farklı akvaryum balık türleri, (*Astronotus ocellatus*, astronot ya da oscar (n=3), *Carassius auratus*, japon (n=11), *Symphsodon discus*, diskus (n=3), *Betta splendens*, beta (n=2), *Poecilia reticulata*, lepistes (n=5), *Cichlasoma nigrofasciatum*, konvikt çiklid (n=13), *Labidochromis caeruleus*, sarı prenses (n=8), *Pterophyllum scalare*, melek (n=2), *Poecilia sphenops*, siyah moli (n=3) ve *Heros efesciatus*, severum (n=5)) parazitik yönden incelendi. Balıklardan *Dactylogyrus* sp., *Gyrodactylus* sp. (Monogenea), *Epistylis* sp. *Chilodonella cyprini*, *Ichthyophthirius multifiliis*, *Tetrahymena* sp., *Trichodina* spp., *Vorticella* sp. (Ciliates), *Hexamita* sp., *Ichthyobodo necator* (flagellates) ve *Piscinoodinium pillulare* (Dinoflagellate) parazitleri izole edildi. *I. multifiliis*, *I. necator* ve *Trichodina* spp. bütün parazitler arasında en yüksek prevalansa (%16.36) sahip parazitler olarak kaydedildi. İncelenen 55 balıktan 50'sinin (%90.90) parazitlerle enfeste olduğu belirlendi. Aynı zamanda *Vorticella* sp. *Cichlasoma nigrofasciatum*'un salungaçlarından, *Piscinoodinium pillulare* ise *Betta splendens'*in derisinden ilk kez bu çalışmada rapor edilmiştir.

Anahtar Kelimeler: Akvaryum, Enfestasyon, *Piscinoodinium pillulare*, Prevalans, *Vorticella* sp.

Introduction

Aquarium fish trade is a very important sector in all over the world (Winfree, 1989). Trade of ornamental fish is a multi-million dollar business which includes one hundred countries. They are an important source of overseas benefit for many rustic communities in Africa, South America and South East Asia. Thousands of types of aquarium fish (commonly, poeciliids, guppy and cichlids) are kept by hobbyists. The largest part of the aquarium fish industry is the freshwater aquarium fish sector (Helfman, 2007).

Although it has many positive contributions, the ornamental fish trade may have adverse effects as a result of the introduction of nonnative species and spread of different diseases agents (Andrews, 2006). The occurrence of parasites at ornamental fish, in Turkey, has been documented by different papers (Koyuncu and Cengizler, 2002; Koyuncu, 2009; Kayis et al., 2009). These studies include many protozoan and metazoan parasites and also their host fish such as; *Ichthyobodo* sp., *Ichthyophthirius multifiliis*, *Chilodonella* sp., *Trichodina* spp., *Dactylogyrus extensus*, *Gyrodactylus bullatarudis*, *Lernaea cyprinacea*, *Argulus foliaceus*, *Argulus japonicus* and *Capillaria* sp. from gold fish, guppy and cichlids (Koyuncu, 2009), *Ambiphyra* spp. from guppy (Kayis et al., 2009) and *Oodinium pillularis* from *Poecilidae* (Koyuncu and Cengizler, 2002).

Ornamental fish pathogens spread very quickly in the world because of their commercial benefits. Therefore, routine infectious diseases controls are very important for risk analysis and precaution steps. For these reasons, we aimed to isolate and identify different protozoan and metazoan fish parasites from variety of aquarium fish species in Turkey between 2009 and 2010.

Materials and Methods

A total of 55 fish from 10 different ornamental fish species, astronot *Astronotus ocellatus*, (3), goldfish *Carassius auratus*, (11), discus *Symphsodon discus*, (3), beta *Betta splendens*, (2), guppy *Poecilia reticulata*, (5), convict cichlid *Cichlasoma nigrofasciatum*, (13), blue streak hap *Labidochromis caeruleus*, (8), angelfish *Pterophyllum scalare*, (2), black molly *Poecilia sphenops*, (3) and severum *Heros efasciatus*, (5) were sampled each month between 2009 and 2010 from the aquarium unit of Fisheries Faculty at Rize University, two different pet shops in Rize at the North East part of Turkey and one aquarium fish hatchery in İstanbul at the North West part of Turkey.

Live fish were transferred to fish diseases laboratory at the Fisheries Faculty with aerated water with portable air pump or plastic bags including ice and examined for external (skin, fins and gills of fish) and internal (intestine and blood of fish) parasites. The parasites, if found, were identified according to the methods described by Lom and Dykova, 2002 and Shinn et al., 2004. Parasites, their host and location of parasites in fish were recorded. Prevalence of parasites was determined for both total and also each fish species.

Results and Discussion

Nine protozoans, ciliate (6), flagellate (2) and dinoflagellate (1) and two metazoans, monogenean (2) were identified in ten different fish species (Table 1). All identified parasites were external except for *Hexamita* sp. Parasites were commonly observed on gills, however, *Trichodina* spp. and *Epistylis* sp. were observed on both skin and gills of fish.

Clear hemorrhagic areas on the skin of *Carassius auratus* infested with *Gyrodactylus* sp. and destruction of gill, irregular scales and irritation of fins of *Astronotus ocellatus*, with infested *Dactylogyrus* sp., were observed. Also the fish showed anorexia and lethargy.

All parasites were isolated from gold fish, *Carassius auratus* except for *Vorticella* sp., *Tetrahymena* sp. and *Piscioodinium pillulare*. Mix infestation of *Trichodina* spp. and *Ichyophthirius multifiliis* was observed on the gills of *Carassius auratus*. Prevalence of the parasites for each fish species was presented in Table 2.

Different parasites species were reported from various ornamental fish species. *Gyrodactylus katharineri* and *Gyrodactylus carassii* from *Carassius carassius* were reported by (Koyun, 2000; Aydogdu, 2006) in Turkey. In this context, present study is similar to the previous studies. Twenty-one *Dactylogyrus* species have been reported from *Carassius carassius*, (Sağlam, 1992), *Barbus esocinus*, *Cyprinus carpio*, (Ozer and Ozturk, 2005), *Chalcalburnus chalcoides*, *Vimba vimba* (Soylu and Emre, 2007) *Pseudophoxinus antalyae* (Soylu, 1990), *Rutilus rutilus*, *Blicca bjoerkna* (Karatoy and Soylu, 2006), *Abramis brama* (Scott, 1985) in Turkey. The guppy *Poecilia reticulata*, which is an important ornamental fish, is host for *Gyrodactylus bullatarudis* and *Gyrodactylus turnbulli* (Scott, 1985). However, these parasites rarely were identified from ornamental fish. According to this, only *Dactylogyrus anchorarys* have been reported from gold fish (*C. carassius*) (Koyun, 2000; Aydogdu, 2006) from Turkey. In the study, *Dactylogyrus* sp. was reported for the first time from *Astronotus ocellatus* in the country.

Protozoan parasites have been reported particularly in fish farms hatchery. *Trichodina* spp., *Ichthyobodo necator* and *Ichyophthirius multifiliis* are the most important and common fish parasites in all aquatic systems. These parasites were reported from different consumed and ornamental fish species (Kayis et al, 2009). Unlike previous studies, *Trichodina* spp. from *Heros efasciatus*, *I. necator* from *Poecilia sphenops* and *I. multifiliis* from *Symphsodon discus* were reported in this study.

Tetrahymena sp. is called guppy disease because of its predilection for guppies. And also this parasite affects other fish such as cichlids and tetras (Lom and Schubert, 1983; Imai et al., 2000). However, *Tetrahymena* spp. has been rarely reported from fish in Turkey (Kayis et al, 2009). In the present study *Tetrahymena* was identified from *Cichlasoma nigrofasciatum* and *Labidochromis caeruleus*.

Most reported dinoflagellate parasites were from aquarium fish (Lom and Schubert, 1983). Many tropical fish species, such as cyprinids, are susceptible to *Piscinoodinium*. *Amyloodinium ocellatum* from *Dicentrarchus labrax* (Cagırgan and Toksen, 1996) and *Oodinium pillularis* from *Cyprinus carpio* and *Poecilia* spp. (Saglam, 1992; Koyuncu and Cengizler, 2002) have been reported in Turkey. In the present study, *Piscinoodinium pillulare* was reported for the first time from *Betta splendens* in the country (Image 1).

Although *Vorticella* sp. are free-living ciliophorans, *Epistylis* sp. are sessile, colonial ectocommensal ciliate attacking the surface of fish skin and gills (Lom and Dykova, 1992). *Vorticella* sp. was reported for the first time from gills of *Cichlasoma nigrofasciatum* in the present study.

Table 1. Fish pathogens, host fish and isolation area of pathogens on fish species, G: gills, S: skin, In.: Intestine.

Parasites	**Host**	**Location**
Metazoan		
Monogenea		
Dactylogyrus sp.	*Astronotus ocellatus*	G
	Carassius auratus	G
	Symphsodon discus	G
Gyrodactylus sp.	*Carassius auratus*	S
Protozoan		
Ciliates		
Epistylis sp.	*Carassius auratus*	S/G
Chilodenella cyprini	*Carassius auratus*	S
Ichyophthirius multifiliis	*Astronotus ocellatus*	G
	Carassius auratus	G
	Symphsodon discus	S
Tetrahymena sp.	*Poecilia reticulata*	G
	Cichlasoma nigrofasciatum	G
	Labidochromis caeruleus	G
Trichodina sp.	*Carassius auratus*	G
	Heros efasciatus	S/G
	Labidochromis caeruleus	S/G
Vorticella sp.	*Cichlasoma nigrofasciatum*	G
Flagellates		
Hexamita sp.	*Carassius auratus* *Pterophyllum scalare*	In.
Ichthyobodo necator	*Carassius auratus*	G
	Poecilia reticulata *Poecilia sphenops*	S
Dinoflagellate		
Piscinoodinium pillulare	**Betta** *splendens*	S

Table 2. Host fish, parasites and their prevalence,

Fish Species **Parasites**	**SF**	**IF**	**Prevalence %**
Astronotus ocellatus	3		
Dactylogyrus sp.		1	33.3
Ichyophthirius multifiliis		2	66.6
Betta ***splendens***	2		
Piscinoodinium pillulare		2	100
Carassius auratus	11		
Dactylogyrus sp.		1	9.09
Gyrodactylus sp.		2	18.18
Epistylis sp.		1	9.09
Chillodenella cyprini		3	27.27
Ichyophthirius multifiliis		5	45.45
Trichodina sp.		3	27.27
Hexamita sp.		2	18.18
Ichthyobodo necator		5	45.45
Cichlasoma nigrofasciatum	13		
Tetrahymena sp.		2	15.38
Vorticella sp.		1	7.69
Heros efasciatus	5		
Trichodina sp.		3	60
Labidochromis caeruleus	8		
Tetrahymena sp.		2	25
Trichodina sp.		3	37.5
Poecilia reticulate	5		
Tetrahymena sp.		2	40
Ichthyobodo necator		3	60
Poecilia sphenops	3		
Ichthyobodo necator		1	33.3
Pterophyllum scalare	3		
Hexamita sp.		3	100
Symphsodon discus	2		
Dactylogyrus sp.		1	50
Ichyophthirius multifiliis		2	100
Total	**55**	**50**	**90.90**

SF; sampled fish, IF; infested fish.

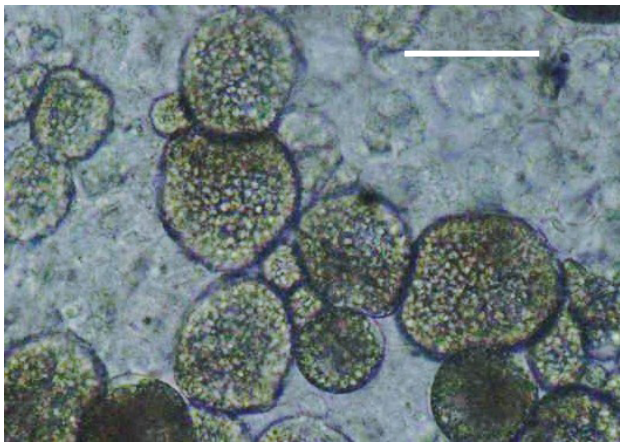

Image 1. Individuals of *Piscinoodinium pillulare* isolated from **Betta** *splendens*, scale bar: 20µm

Conclusions

Fish parasites cause high mortality in aquaculture and ornamental fish production particularly in larval stage of fish. Some of the fish which were sampled in the present study have been produced in Turkey, but some fish species were imported from different countries (Turkmen and Alpbaz, 2001). Therefore, this study shows that good health management's practices, prevention of contamination and hygiene precautions are very important issues in fish productions and transport.

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