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RESEARCH ARTICLE

First Record of Parasitic Annelida-Hirudinea (*Piscicola geometra* Linnaeus, 1761) on *Carassius gibelio* (Bloch, 1782) in Lake Uluabat (Turkey)

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Summary

This study investigated the presence of parasitic annelids on *Carassius gibelio* in Lake Uluabat, Turkey. Data were obtained from on-site surveys carried out between March 2006 and February 2007. Only one parasite species, *Piscicola geometra* (Linnaeus, 1761), was identified on only one samples of *Carassius gibelio*'s operculum. Although *P. geometra* was reported from various lakes in Turkey (such as Sapanca, Keban Dam Lake, Terkos, Çavuşçu and Uluabat), up to now there has been no report on *Carassius gibelio* from lake Uluabat.

Keywords: *Piscicola geometra, Carassius gibelio, Lake Uluabat, Hirudinea*

Uluabat Gölü'nde (Türkiye) *Carassius gibelio* (Bloch, 1782)'da Parazitik Annelid -Hirudin *Piscicola geometra* (Linnaeus, 1761)'nın İlk Kaydı

Özet

Bu çalışmada, Uluabat Gölünde *Carassius gibelio* üzerindeki parazitik annelidlerin varlığını araştırılmıştır. Örnekler Mart 2006-Şubat 2007 tarihleri arasında elde edilmiş ve bir *C. gibelio* örneği operkulumu üzerinde parazitik annelidlerden sadece *Piscicola geometra* tespit edilmiştir. *Piscicola geometra* Türkiye'nin farklı göllerinden (örneğin Sapanca, Keban Baraj Gölü, Terkos, Çavuşçu ve Uluabat Gölleri) de bildirilmiş olmasına rağmen, bugüne kadar Uluabat Gölü *Carassius gibelio* örneklerinden bildirilmemiştir.

Anahtar sözcükler: *Piscicola geometra, Carassius gibelio, Uluabat Gölü, Hirudinea*

INTRODUCTION

Carassius gibelio is known as not only a hazardous fish species for native fish communities but also for non-native species in European inland waters [1,2]. Many exotic species have been introduced as eggs, fry or fingerlings for different purposes over the last five decades into Europe from Asia in the 17th century and has since become widely distributed throughout Europe [3]. It is reported that total of 25 exotic species have been introduced in Turkey and one of them is *C. gibelio* [4]. Up to now, it has been reported from 46 different freshwater systems of Turkey [5].

Egzotic fish species tolerance limits are high, their outnumber local species in the fresh water bodies they live in and can become a serious threat in terms of diversity of species in the long run. Since every exotic species can bring about exotic organisms including parasites, emergence of new diseases in natural species that constitute ichthyofauna is another serious draw-back [6]. Lake Uluabat, which is one of the most important wetland areas of Turkey, is faced with threats posed by both environmental pollutants and invasion of *C. gibelio* (Bloch, 1782) which is not a natural species of the lake [7,8].

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According to the records of Gölyazı Fishery Cooperative, in 2006, 412 tons of *C. gibelio* (Bloch, 1782), 93.5 tons of *Esox lucius* (Linnaeus, 1758), 31.5 tons of *Cyprinius carpio* (Linnaeus, 1758), 61 tons of *Rutilus rutilus* (Linnaeus, 1758), 18.5 tons of *Scardinius erythophthalmus* (Linnaeus, 1758) were caught from Lake Uluabat. *C. gibelio,* which did not exist in Lake Uluabat until the beginning of 2000s, constituted 68.8% of the total fishing. This shows us that *C. gibelio* species have totally invaded Lake Uluabat and have become the dominant species of the environment [9].

Metazoan fish parasites include trematodes, cestodes, nematodes, acanthocephalans, leeches, and parasitic crustaceans [10]. These parasites can cause gill infestations, damage to eyes and internal organs, starvation, inflammation of the swim bladder, and inhibited oxygen exchange across gill lamella. They provide portals of entry for bacteria in fish [11]. Leeches (Hirudinea, Piscicolidae) are considered as ectoparasites and they are found virtually anywhere on the external body surface of fish e.g., body surface, in mouth, branchial chamber or cloaca. They can induce tissue damage, osmoregulatory problems, and act as vectors of pathogens e.g., blood-borne protozoa [12]. Although, a checklist of metazoan parasites recorded in freshwater fish from Turkey were made [13], but our knowledge about freshwater fish parasites in Turkey is still insufficient. According to literature data, eight parasites species (*Piscicola geometra* Lin., 1761 [14-19], *Hirudo medicinalis* Linnaeus, 1758 [20], *Trachellobdella torquata* (Grube 1871) [21], *Hemiclepsis marginata* Müller, 1774 [22], *Helobdella stagnatis* Lin., 1758 [20], *Cystobranchus respirans* Troschel, 1850 [22], *Piscicola* Blainville 1818 sp.[23] and *Actinobdella* Moore, 1906 sp.[24]) were recorded from different parts of Turkey.

The objectives of this study were to investigate the presence of parasitic annelids on *C. gibelio* in Lake Uluabat.

MATERIAL and METHODS

Lake Ulubat is a eutrophic lake situated to the South of the Marmara Sea. It covers an area of 160 km^2 and has a total drainage area of 10.555 km^2. Because of its rich biodiversity, lying on a migratory bird route and almost all its shores being covered with submerged plants, Lake Uluabat is one of the most important wetlands of Turkey. The lake is protected by the Ramsar Convention.

Total 466 *C. gibelio* individuals were examined in order to detect parasitic annelids from March 2006 to February 2007 taken from Lake Uluabat. Fish samples were taken from fishermen monthly in the study period. The fish were transported to the laboratory alive and then examined under stereomicroscope. Parasitic annelids samples removed from the operculum of *C. gibelio,* and they were killed in hot (not boiled) 4% formaldehyde solution and were preserved in 70% ethanol. All samples were cleared in lactophenol. Identifications were performed according to Burreson [12].

RESULTS

During one year period 466 *C. gibelio* were examined and only one species of parasitic annelids, *P. geometra,* was found on *C. gibelio's* operculum.

Pisciola geometra Lin., 1761

Material examined: Removed from the operculum of *C. gibelio* from Lake Uluabat.

General Distribution: Europe, Central Asia, North America [12,25].

Hosts: Freshwater fish, especially *Cyprinidae* [12,25].

Size: Total length, 33 mm; width, 3.4 mm.

Remarks: Body about 10-11 times as long as wide, anterior part of the body only slightly less wide than posterior; caudal sucker approximately 1.2 times as large as body width.

P. geometra was previously reported from Lake Uluabat by on the body surface of *Tinca tinca* [26]. The species is recorded for the first time on *C. gibelio* and it is a new host for *P. geometra* in Turkey.

DISCUSSION

Piscicola geometra was previously reported from eight host species, *Rutilus rutilus* (from Lake Sapanca, [27]), *Scardinius erytrophthalmus* (from Lake Sapanca, [27] and Lake Terkos, [28]), *Blicca bjoerkna* (from Lake Sapanca, [27]), *Tinca tinca* (from Lake Sapanca, [27]; Lake Uluabat, [26]), *Esox lucius* (from Lake Sapanca, [27]), *Barbus rajanorum mystaceus* (from Keban Dam Lake, [29]), *Abramis brama* (from Lake Terkos, [30]) and *Cyprinus carpio* (from Lake Çavuşçu, [31]).

As we mentioned above, up to date, eight species of freshwater leeches have been reported from different lakes of Turkey. Information about the *P. geometra's* distribution shows it is the most common freshwater leech species and it's is distribution only fragmentary and the species seems to be scarce in lakes.

Carassius gibelio, which is not a natural species of Turkey, can adapt to every kind of freshwater system

thanks to its high adaptation power and become the dominant species of the environment thanks to its high reproduction power (ginogenetic reproduction). Due to its ability to live in every kind of freshwater system, its high efficiency and similarity to the *Cyprinius carpio* species, this species has been infused into many of our freshwater systems sometimes deliberately and sometimes accidentally for the last 20-25 years. During this infusion, the parasites living on this species can pass from one system to another or fish parasites can intensely be seen in the environment as the number of appropriate hosts for parasites -which are not seen intensely since they cannot find sufficient number of hosts although they have been to freshwater environment before- increases. As a result of this, parasites infect many species not infected before and the ecological balance in the environment can be disrupted thus, parasite studies conducted on invasive *C. gibelio* species, which is not a natural species of Turkey, gains special importance. This study contributes to the related literature on this issue.

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