

FINDING OF TRIPLOID *CARASSIUS GIBELIO* (BLOCH, 1780) (CYPRINIFORMES, CYPRINIDAE), IN TURKEY

by

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RÉSUMÉ. - Découverte de *Carassius gibelio* triploïdes (Bloch, 1780) (Cypriniformes, Cyprinidae) en Turquie.

Deux femelles de *Carassius gibelio* ont été découvertes le 5 mars 2002 à la poissonnerie centrale d'Istanbul. Ces individus provenaient du barrage de Kayalikoy, près de la ville de Kırklareli en Thrace turque. Le niveau de ploïdie de ces poissons a été estimé par l'analyse d'image assistée par ordinateur de l'aire des noyaux des érythrocytes. L'aire moyenne des noyaux, mesurée sur 100 cellules, s'élève respectivement à $19,85 \pm 2,00 \mu\text{m}^2$ et $18,27 \pm 1,64 \mu\text{m}^2$, ce qui permet de supposer qu'il s'agit de triploïdes. *Carassius gibelio* étant connu comme une espèce dangereuse pour les communautés de poissons autochtones, sa diffusion devrait être interdite.

Key words. - Cyprinidae - *Carassius gibelio* - Turkey - Triploidy - Introduction - Pest species - Aquaculture.

Introduced fish species are a serious problem in the conservation of freshwater faunas, since they affect native ichthyocoenoses as well as amphibian and invertebrate communities (Polhemus, 1993; Elvira, 2001; Gillespie, 2001). The effect is especially strong in areas with small water basins and a high degree of endemic native taxa, like the northern Mediterranean or Anatolia (Elvira, 2001).

The Gibelio, *Carassius gibelio* (Bloch, 1780) is well known as a hazardous fish species for native fish communities. The Gibelio easily becomes one of the dominant species in stagnant and slow running waters and may change the flow of nutrients in the whole ecosystem (Paulovits *et al.*, 1998). In Lake Mikri Prespa, turbidity increased following the introduction of Gibelio (Crivelli, 1995). The Gibelio is furthermore suspected to be a strong competitor for endangered fish species like *Carassius carassius* L. (Lelek, 1980). Thus, any introduction of such pest species to areas previously uninfected has to be watched with big awareness and campaigns to limit their spread should be initiated.

One remarkable feature of stocks of *C. gibelio* is the predominance of triploid gynogenetic females with chromosome numbers around 150. Only comparably few diploid females with chromosome number of 100 and very few males occur. The gynogenetic females are clonal sperm parasites on co-occurring fish species: they use males of these species for spawning, but the male's sperm only induces the development of the egg without a genetic contribution (Peñáz *et al.*, 1979; Vasilev, 1984).

The present note describes a finding of *Carassius gibelio* in Turkey. We give characters for identification and discuss potential effects of a further distribution of these species.

MATERIAL AND METHODS

Labelled as carp, *Cyprinus carpio* L., several dozens of *C. gibelio* were offered on the central fish market in Istanbul (Fig. 1). According to the seller, the fish originated from the Kayalıköy dam near the city of Kırklareli in Turkish Thracia ($41^{\circ}44'N-27^{\circ}15'E$) (Fig. 1). Two specimens of *C. gibelio* were taken for identification of their ploidy level (Fig. 2). The bodies are stored in the collection of National Museum in Prague (NMP6V80084, MP6V80085). According to Flajšhans (1997), samples were prepared at the Fisheries Faculty Laboratory, University of Istanbul. Blood was taken from the caudal vein by a heparinized syringe; one blood smear was prepared on microscope slides for each specimen and fixed in 90% ethanol. Slides were stained in a 20% Giemsa solution. Computer-assisted image analysis was carried out at Department of Veterinary Disciplines, Faculty of Agronomy, Czech University of Agriculture in Prague. The system consists of Microscope Nikon Eclipse 600, analog video camera Hitachi HVC 20, software L.U.C.I.A (Laboratory Universal Computer Image Analysis) version 4.2 from Laboratory Imaging s.r.o. Prague. The mean area of nuclei was calculated from one hundred erythrocytes from each blood smear. Blood smears of diploid and triploid *C. gibelio* from the Czech Republic (identified by karyotype analysis according to Ráb and Roth, 1989) were used as reference.

Morphometric measurements and meristic counts were carried out at the Laboratory of Fish Genetics, Institute of Animal Physiology and Genetics of Academy of Science of the Czech Republic.

RESULTS

Gibelio can be easily separated from carps, *Cyprinus carpio*, by the absence of barbels in the corners of the mouth. In comparison with the similar *Carassius carassius* L., the Gibelio always lacks a dark spot on the caudal peduncle, has a concave upper edge of dorsal fin and a black peritoneum and the serration on the posterior edge of the last unbranched dorsal fin ray is coarser. Both specimens of *C. gibelio* were females with a mean area of erythrocyte nuclei of $19,85 \pm 2,00 \mu\text{m}^2$ and $18,27 \pm 1,64 \mu\text{m}^2$, respectively (Fig. 2). These values correspond to the nucleus area of triploid specimens from Czech Republic ($18,5 \pm 2,8 \mu\text{m}^2$). In contrast, diploid fish from Czech Republic had nuclei area of $10,76 \pm 1,14 \mu\text{m}^2$. Morphologic features of two fish are given in table 1.

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DISCUSSION

To our knowledge, *C. gibelio* was not recorded from Turkey until now (Kuru, 1996; Geldiay and Balik, 1999). The appearance of *C. gibelio* is probably connected with the occurrence of this fish in Bulgaria where it was firstly found in lake Gebežensko (now Beloslawsko) near Varna. At present, its range includes whole Bulgaria and it is one of the most common and in many places even industrially exploited species there (Holčík *et al.* 1978).

Since this species is present in aquaculture stocks in large parts of Europe, an introduction with aquaculture fish is likely. This introduction was not necessarily intended, since the Gibelio often is mixed in carp stocks or misidentified as carp, like on the fish market in Istanbul. More important than its history are the future and impact of this species in Turkish waters. At the moment, it may not have established populations across the Bosphorus, but hidden in the stock transferred for aquaculture they can be expected in the nearest future to do so. Since stocking of natural lakes and rivers is common in Turkey, all species handled in aquaculture will soon or later enter open waters in Anatolia. And in these shallow lakes with soft bottom, submersed vegetation and many endemic small fish, *C. gibelio* may develop significant populations and become an important controller of nutrition flow within the ecosystems and a severe competitor for native fish species.

To preserve biodiversity and protect endemic freshwater animal species, care has to be taken not to distribute alien species as Gibelio uncontrolled. In the light of many negative impacts of introduced fish species, any stocking should generally be restricted to the minimum or completely avoided.

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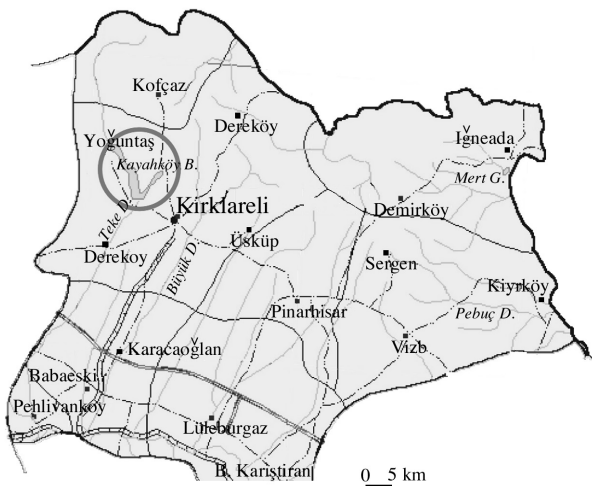


Figure 1. - Map of the area where the fish were collected (Kayalıköy dam in Thracia region, Turkey).



Figure 2. - *Carassius gibelio*, from the fish market in Istanbul. Number NMP6V80085.

Table I. - Morphometric characters and meristic features of the two specimens of *Carassius gibelio* from Kayalıköy dam in Thracia region, Turkey.

Morphometric characters	<i>Carassius gibelio</i> NMP6V80084		<i>Carassius gibelio</i> NMP6V80085	
	mm	% SL	mm	% SL
Standard length	173	x	172	x
Total length	222	x	217	x
Head length	46.8	27.1	45.2	26.3
Body depth	69.5	40.2	67.2	39.1
Predorsal length	88.4	51.1	87.3	50.8
Preanal length	130.5	75.5	130.5	75.9
Preventral length	82.4	47.6	81.6	47.4
P-V distance	36.2	20.9	39.1	22.7
P-A distance	85.5	49.4	86.7	50.4
Caudal peduncle length	24.5	14.2	21.8	12.7
Minimum depth	27.2	15.7	26.4	15.3
Caudal peduncle depth	31.6	18.3	30.0	17.4
Dorsal base length	61.0	35.3	63.0	36.6
Anal base length	17.2	9.9	15.7	9.1
Ventral fin length	31.9	18.4	33.6	19.5
Pectoral fin length	30.3	17.5	28.1	16.3
Head width	31.0	17.9	29.5	17.2
Preorbital length	12.5	7.2	14.0	8.1
Postorbital length	24.6	14.2	24.8	14.4
Eye diameter	10.5	6.1	10.2	5.9
Interorbital distance	19.1	11.0	19.3	11.2
Meristic features				
Dorsal fin rays	IV/17		IV/18	
Anal fin rays	III/6		III/6	
Scales in lateral line	31		31	
Scales above lateral line	7		6	
Scales below lateral line	6		6	
Number of gill rakers	46		48	
Pharyngeal teeth	4-4		4-4	

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