

New records of *Dreissena polymorpha* (Pallas, 1771) (Mollusca: Bivalvia: Dreissenidae) from Central Italy

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Abstract

New populations of *Dreissena polymorpha* have been found in Tuscany in both 2003 and 2005. These findings indicate that the spread of *D. polymorpha* is still in progress and that this invasive mollusc continues to colonise Italian river basins.

Key words: Bivalvia, *Dreissena polymorpha*, inland waters, invasive species, Italy, Tuscany

In Italy, the first reference of *Dreissena polymorpha* (Pallas, 1771) was that of Giusti and Oppi (1973) in Lake Garda and since then this bivalve has been spreading almost all over North Italy in various river basins with an Adriatic drainage (Cianfanelli et al. 2007b), while the central southern Italian inland waters were known to have been colonised in two sites in Molise (Bodon et al. 2005) and in only one site in a Tyrrhenian catchment (Lake Trasimeno, Spilinga et al. 1999).

In July 2003 a new population of *D. polymorpha* was found in the artificial Lake Pavana (Figure 1) during a research survey on protected molluscan fauna in the Pistoia Province (Northern Tuscany, Central Italy) (Lori and Cianfanelli 2003). This is the first record of the zebra mussel in Tuscany, even though it is located in the Reno hydrographic basin, one of the few Tuscan rivers with an Adriatic drainage. This small lake (0.08 km²) originates from the dam of a hydroelectric power plant and is fed by the Stream Limentra di Sambuca, which

constitutes the boundary between two regions, Emilia Romagna and Tuscany. Lake Pavana is one of a group of hydroelectric reservoirs in the same area in the south of Emilia Romagna, Lakes Brasimone, Santa Maria and Suviana, where *D. polymorpha* has been present since 1999 (Cianfanelli et al. 2007a). Lake Suviana and Lake Pavana are linked by pipes that can occasionally pump water in both directions (Regione Toscana 2005), therefore we could expect the transfer of *D. polymorpha*, probably through its planktonic larvae.

In 2005 some specimens of *D. polymorpha* were noted by dam maintenance men at work in the Lake Bilancino (5.10 km²) in the province of Florence, Tuscany (Figure 1). This artificial lake was planned to provide Florence with water and energy (hydroelectric power plant). As this reservoir was recently constructed (finished in 1995 and tested in 2002), Lake Bilancino represents a great opportunity for research into pioneer settlements of aquatic species, in particular non-indigenous ones. Besides

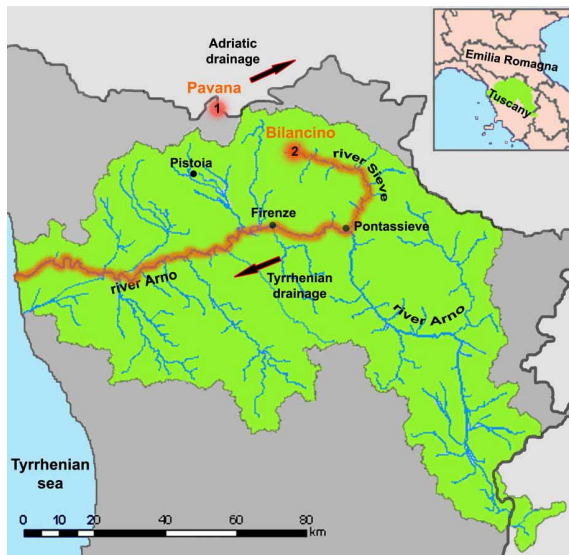


Figure 1. Collection sites of *Dreissena polymorpha* in Tuscany: 1. Lake Pavana (2003); 2. Lake Bilancino and River Sieve (2006). In green the hydrographic basin of River Arno, in red the probable route of future spread along the Tyrrhenian drainage area

D. polymorpha, whose populations have already peaked in 2006 (Figure 2), there are other non-indigenous molluscan species in the lake waters: the New Zealand mudsnail *Potamopyrgus antipodarum* (Gray, 1843), the bladder snail *Haitia acuta* (Draparnaud, 1805) (Figure 3) and the Chinese pond mussel *Anodonta woodiana* (Lea, 1834). Moreover, other allochthonous species for Italy have been identified in Lake Bilancino: Coelenterata: the freshwater jellyfish *Craspedacusta sowerbyi* (Lankester, 1880) (Benvenuti pers. com.); Crustacea: the red swamp crayfish *Procambarus clarkii* (Girard, 1852); Osteichthyes: the channel catfish *Ictalurus punctatus* (Rafinesque 1818), the black bullhead *Ictalurus melas* (Rafinesque, 1820) (Figure 3), the pumpkinseed sunfish *Lepomis gibbosus* (Linnaeus, 1758), the wels catfish *Silurus glanis* (Linnaeus 1758), the white sturgeon *Acipenser transmontanus* (Richardson, 1836); Mammalia: the coypu *Myocastor coypus* (Molina, 1782).

This new settlement of zebra mussel is highly significant as it provides a second record for the Tyrrhenian drainage. It is possible to suppose that the route of *D. polymorpha* invasion will initially follow the course of the River Sieve, which drains from Lake Bilancino, and subsequently reach the Arno after its confluence



Figure 2. Clusters of *Dreissena polymorpha* on the shore of Lake Bilancino, exposed because of low water level (Photographed by S. Cianfanelli)



Figure 3. Three non-indigenous species from Lake Bilancino: *Dreissena polymorpha*, *Ictalurus melas*, *Haitia acuta* (Photographed by S. Cianfanelli)

at Pontassieve (Figure 1). Some specimens, in fact, have already been collected in the River Sieve downstream of the dam (see Annex).

According to the Global Invasive Species Database of IUCN (2006) *D. polymorpha* is one of the 100 World's Worst Invasive Alien Species, and its negative impacts on the ecosystem and especially its economical damage are well known. Despite this fact and an Italian national law (D.P.R. n. 357/1997) and a regional law by Regione Toscana (L.R. 56/2000), which regulate the management of non-indigenous species, little has been done in Tuscany to concretely face the problem of their introduction and diffusion. After these new findings, the prospect of controlling the spread of *D. polymorpha* through Central Italy seems less realistic.

Acknowledgements

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Annex

Records of *Dreissena polymorpha* in Tuscany*

Map Ref.	Location	Geographic coordinates		Record date	Collector
		Latitude, °N	Longitude, °E		
1	Lake Pavana (PT)	44°07'11"	11°00'13"	16.07.2003	S. Cianfanelli, E. Lori and S. Vanni
1	Lake Pavana (BO)	44°07'08"	11°00'20"	16.07.2003	S. Cianfanelli, E. Lori and S. Vanni
2	Lake Bilancino (FI)	43°58'38"	11°14'00"	02.08.2006	S. Cianfanelli and E. Lori
2	Lake Bilancino (FI)	43°58'28"	11°14'34"	02.08.2006	S. Cianfanelli and E. Lori
2	Lake Bilancino (FI)	43°58'26"	11°16'38"	02.08.2006	S. Cianfanelli and E. Lori
2	Lake Bilancino (FI)	43°58'52"	11°14'47"	22.10.2006	S. Cianfanelli and M. Calcagno
2	Lake Bilancino (FI)	43°59'23"	11°14'47"	28.10.2006	S. Cianfanelli and M. Calcagno
2	Lake Bilancino (FI)	43°59'07"	11°15'13"	28.10.2006	S. Cianfanelli and M. Calcagno
2	Lake Bilancino (FI)	43°58'58"	11°16'11"	28.10.2006	S. Cianfanelli and M. Calcagno
2	Lake Bilancino (FI)	43°59'52"	11°17'02"	28.10.2006	S. Cianfanelli and M. Calcagno
2	River Sieve (FI)	43°57'58"	11°19'42"	12.11.2006	S. Cianfanelli and M. Calcagno
2	River Sieve (FI)	43°57'46"	11°18'22"	12.11.2006	S. Cianfanelli and M. Calcagno

* Full reference to the data: Lori E and Cianfanelli S (2006) New records of *Dreissena polymorpha* (Pallas, 1771) (Mollusca: Bivalvia: Dreissenidae) from Central Italy. Aquatic Invasions 1(4): 281-283