



ALIEN *SINANODONTA WOODIANA* (LEA, 1834) AND PROTECTED *ANODONTA CYGNEA* (LINNAEUS, 1758) (BIVALVIA: UNIONIDAE) IN THE SPYTKOWICE POND COMPLEX

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ABSTRACT: Dead individuals of Chinese mussel *Sinanodonta woodiana* (Lea) were found in 2009 in the complex of fishponds in Spytkowice (S. Poland) in the Vistula River valley. Earlier records of this invasive alien species in Poland come mostly from heated waters. Its occurrence in fishponds indicates that it tolerates also colder waters; many aquatic ecosystems in Poland may be threatened with its invasion. Endangered swan mussel *Anodonta cygnea* (Linnaeus) was found in the same fishponds. The species had not been reported from this area before and it is uncertain whether persistence of its population here is threatened by the invasion of Chinese mussel.

KEY WORDS: *Sinanodonta woodiana*, alien species, biological invasions, *Anodonta cygnea*, endangered species, Spytkowice fishponds

The complex of fishponds in Spytkowice in the upper part of the Vistula River valley is one of the most valuable areas for breeding and migrating waterfowl in southern Poland. In 2008 it was included in Natura 2000, site "The lower Skawa valley". It comprises 66 shallow, nutrient-rich carp ponds, with the total water surface of approximately 500 ha. Apart from carp, also grass carp, silver carp, Prussian carp, catfish, pike, tench, orfe, and perch are farmed there (MALCZYK 2009).

Three dead individuals of the alien Chinese mussel *Sinanodonta woodiana* (Lea, 1834) were found in March 2009 in "Nowy Spytkowski" pond (temporarily emptied). Their age was estimated as less than 1 year, 3 (Fig. 1) and 5 years, and the shell lengths were 4.9 cm, 14.7 cm and 20.1 cm, respectively. This is the seventh known locality of this species in Poland and the second one in the Vistula drainage system (KRASZEWSKI 2007). Although the pathways of their introduction are not certain, it can be suspected that they were the same as in the case of earlier introduc-

tions in Poland, that is, accidental release with imported carp or other fish (KRASZEWSKI & ZDANOWSKI 2008). Two other unionids were found in the same pond – the common duck mussel *Anodonta anatina* (Linnaeus, 1758) and the endangered swan mussel *Anodonta cygnea* (Linnaeus, 1758). The latter species had not been reported from this site before. All the mussels were clustered in a small area covering approximately 5% of the pond.

In the Polish Red Data Book the swan mussel is classified as endangered (ZAJAC 2004), thus its occurrence in the Spytkowice fishponds contributes to the high natural value of the area. However, co-occurrence of the invasive alien Chinese mussel rises serious concerns. According to literature data, expansion of this Asian species should be restricted due to natural thermal water regime in Poland (KRASZEWSKI & ZDANOWSKI 2008). So far reproducing populations of the Chinese mussel in Poland were only found in waters heated by cooling systems of electric power stations: Konin Lakes (KRASZEWSKI & ZDANOWSKI 2001)



Fig. 1. A three-year old Chinese mussel *Sinanodonta woodiana* found in the Sptkowice fish ponds. Photo KAMIL NAJBEREK

and the Lower Odra River (DOMAGAŁA et al. 2004). Although there are also records of the species from four localities with more natural thermal regime, including two fishpond complexes, there is no evidence that the species forms a viable population in any of these places (GAŁKA et al. 2007, KRASZEWSKI 2007). The varied age of the individuals found in Sptkowice may suggest that the population is stable and reproducing. This in turn indicates that its tolerance to water temperature is wider than previously thought. Invasion of this species may therefore affect many aquatic ecosystems in Poland. Water level changes in fishponds may not be a limiting factor to the persistence of the species, as unionid mussels are known to

withstand long periods without water, buried in damp bottom (WIDUTO 1968).

Further studies will be carried out to find out if the Chinese mussel occurs in other ponds in Sptkowice, and if it poses a threat to the endangered swan mussel (ZAJĄC 2004).

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REFERENCES

- DOMAGAŁA J., MIGDAŁSKA B., ŁABĘCKA A. M., PILECKA-RAPACZ M. 2004. *Anodonta woodiana* (Lea, 1834) na Pomorzu Zachodnim. Zeszyty Naukowe Uniwersytetu Szczecińskiego. Acta Biol. 10: 199–202.
- GAŁKA M., DOLATA P. T., ANTONOWICZ R. 2007. New localities of the Chinese clam *Sinanodonta woodiana* (Lea, 1834) (Bivalvia, Unionidae) in the Barycz River Valley (Wielkopolska Region). Folia Malacol. 15: 71–74.



- KRASZEWSKI A. 2007. The continuing expansion of *Sinanodonta woodiana* (Lea, 1834) (Bivalvia: Unionidae) in Poland and Europe. *Folia Malacol.* 15: 65–69.
- KRASZEWSKI A., ZDANOWSKI B. 2001. The distribution and abundance of the Chinese mussel *Anodonta woodiana* (Lea, 1834) in the heated Konin lakes. *Arch. Pol. Fish.* 9: 253–265.
- KRASZEWSKI A., ZDANOWSKI B. 2008. *Sinanodonta woodiana* (Lea, 1834). In: GŁOWACIŃSKI Z., OKARMA H., PAWŁOWSKI J., SOLARZ W. (eds). *Księga gatunków obcych inwazyjnych w faunie Polski*. Wyd. internetowe Instytutu Ochrony Przyrody PAN, Kraków.
- MALCZYK P. 2009. Dolina Dolnej Skawy PLB 120005 (IBA PL 125). In: CHMIELEWSKI S., STELMACH R. (eds). *Ostoje ptaków w Polsce – wyniki inwentaryzacji, część I*. Bogucki Wyd. Nauk., Poznań, pp. 184–191.
- WIDUTO J. 1968. Zachowanie się małżów z rodziny Unionidae przy obniżaniu poziomu wody w zbiornikach. *Zesz. nauk. WSR Olszt.* 24 (642): 499–507.
- ZAJĄC K. 2004. *Anodonta cygnea* (Linnaeus, 1758). In: GŁOWACIŃSKI Z., NOWACKI J. (eds). *Polska Czerwona Księga Zwierząt – bezkręgowce*. Wyd. internetowe Instytutu Ochrony Przyrody PAN, Kraków.

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