



NEW LOCALITIES OF THE CHINESE CLAM *SINANODONTA WOODIANA* (LEA, 1834) (BIVALVIA, UNIONIDAE) IN THE BARYCZ RIVER VALLEY (WIELKOPOLSKA REGION)

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ABSTRACT: A new locality of the Chinese clam *Sinanodonta woodiana* (Lea, 1834) was found in a temporarily drained Czesławicki Pond (10.8 ha) near the village of Janisławice (Dolina Baryczy Landscape Park, Sośnie community, Ostrów Wielkopolski district, Wielkopolska region) in September 2006. In this fishpond a dense population of the Chinese clam was observed whose number was estimated as about few hundred individuals. During the second control (January 2007), we observed a few hundred clams in the same pond and we found smaller populations in adjacent ponds of the same Janisławice complex. During a detailed control of the ponds (drained in the autumn 2006) of the fishpond complex near Konradów (120 ha, 2 km SW of the Janisławice complex), only one damaged, empty shell of the Chinese clam was found. Specimens with maximum shell dimensions – 185 mm length and 140 mm width – were found in the Czesławicki Pond. Before, *S. woodiana* was found in Poland only in heated waters which were thought to be necessary for the development of this species. This is the first Polish record of the species in a reservoir with a natural thermal regime.

KEY WORDS: *Sinanodonta woodiana*, *Bivalvia*, fishpond, Barycz River Valley, Wielkopolska region

INTRODUCTION

Sinanodonta woodiana (Lea, 1834) (= *Anodonta woodiana*) is a unionid, originally inhabiting the Amur River basin (KRASZEWSKI & ZDANOWSKI 2001). The species was accidentally introduced into Poland at the turn of the 1980s, as glochidia attached to herbivorous fish species: silver carp *Hypophthalmichthys molitrix* (Valenciennes, 1844) and grass carp *Ctenopharyngodon idella* (Valenciennes, 1844) (KRASZEWSKI 2006). These Asiatic fishes were brought from Hungary and introduced into Konin Lakes in Poland (KRASZEWSKI 2006). The thermal regime of the five lakes: Mikorzyńskie, Ślesieńskie, Pałnowskie, Licheńskie and Gosławskie, heated due to the cooling systems of the Konin and Pałnów electric power plants, fostered the development of the Chinese clam. Literature data suggest that in the regions most intensively warmed, i.e. in the initial cooling basin and discharge canals of

the power plants, the clams grew to 200–225 mm in size and appeared with the density of 30–60 individuals per m² (AFANASYEV et al. 2001, KRASZEWSKI & ZDANOWSKI 2001).

The distribution and density of the population of *S. woodiana* in the five Konin Lakes was determined chiefly by the thermal conditions of the water and its flow. The clams preferred warm habitats, with the optimum temperature ranging seasonally from 10°C to 35°C (KRASZEWSKI & ZDANOWSKI 2001, KRASZEWSKI 2006). The preferences of the species limit its ability to colonise cooler habitats.

This paper presents new sites of *S. woodiana* in the fishponds of natural thermal regime, located in the eastern part of the Landscape Park Dolina Baryczy in the Wielkopolska Region (Western Poland).

CHARACTERISTICS OF THE LOCALITY

The new locality of the Chinese Clam was found on 16th September 2006 in the previously drained Czesławicki Pond (51°29'00"N, 17°33'15"E), located at the outskirts of the village Janisławice (Fig. 1). The basin forms a part of the Janisławice pond complex, which belongs to the Możdżanów Fishery Farm. All the objects are located in the physico-geographical macroregion of the Milicko-Głogowskie Downland and the Milicka Basin mesoregion (KONDRACKI 2000). The ponds in the Barycz River Valley constitute the biggest complex of fishponds and the oldest group of artificial reservoirs in Poland; they were built as early as in the 15th and 16th c. for carp farming (DOBROWOLSKI 1998). The location of the ponds in the Barycz Valley allows for gravitational water inflow

supplying them. The analysed pond complex forms a part of the Dolina Baryczy Landscape Park. The Czesławice pond is a small water reservoir (10.8 ha), 1.5 m deep (seasonal maximum filling). Its bottom is of mineral character, covered with a thin layer of organic sediments. It is a eutrophic utility pond (with abundant phytoplankton), in which the main breeding species is the carp *Cyprinus carpio* L. 1758. The pond has no submerged vegetation; only a small patch in its central part is dominated by *Polygonum amphibium* f. *natans*. The pond is annually drained; during the past three years, however, it was devoid of water for a very brief period of time only.

On 16th September 2006 an abundant population of *Sinanodonta woodiana* was noticed there, estimated to consist of a few hundred individuals, mainly empty shells, damaged specimens or shells containing dead animals. The animals were dispersed in all the pond, partly burrowed in the organic bottom sediments. The maximum shell size of 50 measured individuals was 170 mm in length and 75 mm in width (GĄBKA et al. 2006). A typical specimen collected from the Czesławicki Pond is presented in Fig. 2.

During the second control, on 20th January 2007 (with no ice and snow cover on the drained ponds, very warm winter), we observed a few hundred Chinese clams in the Czesławicki Pond and we found smaller populations in adjacent (separated only by dykes), then drained, ponds of the same complex (Fig. 1): the closest Głębokki (up to 100 specimens and empty shells mainly), Augustyn (ca. 10 specimens), Młyński II (several dozen, empty shells mainly), Zamarzły III (up to 100 specimens), and Zamarzły I (several specimens). During winter observations the largest specimens, among the 350 which were measured, were found in the Czesławicki Pond – 185 mm in length and 140 mm in width. In other ponds the size of *S. woodiana* was much smaller. In ponds drained during the autumn and winter the Chinese clam occurred in organics bottom sediments.

Another locality of the Chinese clam was found on the 20th January 2007, during a thorough control (by three persons) of bottoms of currently drained, not ice- or snow-covered ponds in the Konradów fishpond complex (ca. 120 ha, 2 km SW of the Janisławice complex). There we found only one damaged shell of the Chinese clam on the edge of the complex (51°28'10"N and 17°32'15"E) (Fig. 1).

The Chinese clam could also be present in the fishponds of the neighbouring, third fishpond complex of the Możdżanów Fishery Farm, called Możdżanów complex, where large swan mussels have already been observed (e.g. Cieciora, Metody, Wojciech ponds; K. GIRUS pers. comm.) – during our visits all of these ponds had a high water level and searching for the clams was impossible.

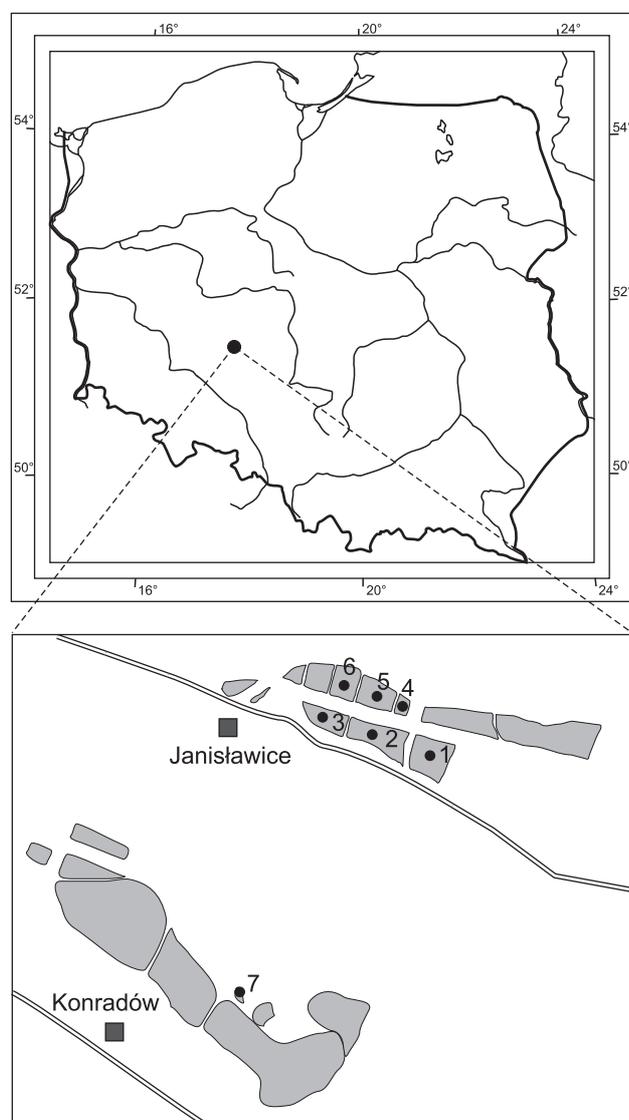


Fig. 1. Localities of *Sinanodonta woodiana* (Lea, 1834) in the Barycz River Valley. Ponds: 1 – Czesławicki, 2 – Głębokki, 3 – Augustyn, 4 – Zamarzły I, 5 – Zamarzły III, 6 – Młyński, 7 – unnamed, in the Konradów fish ponds complex

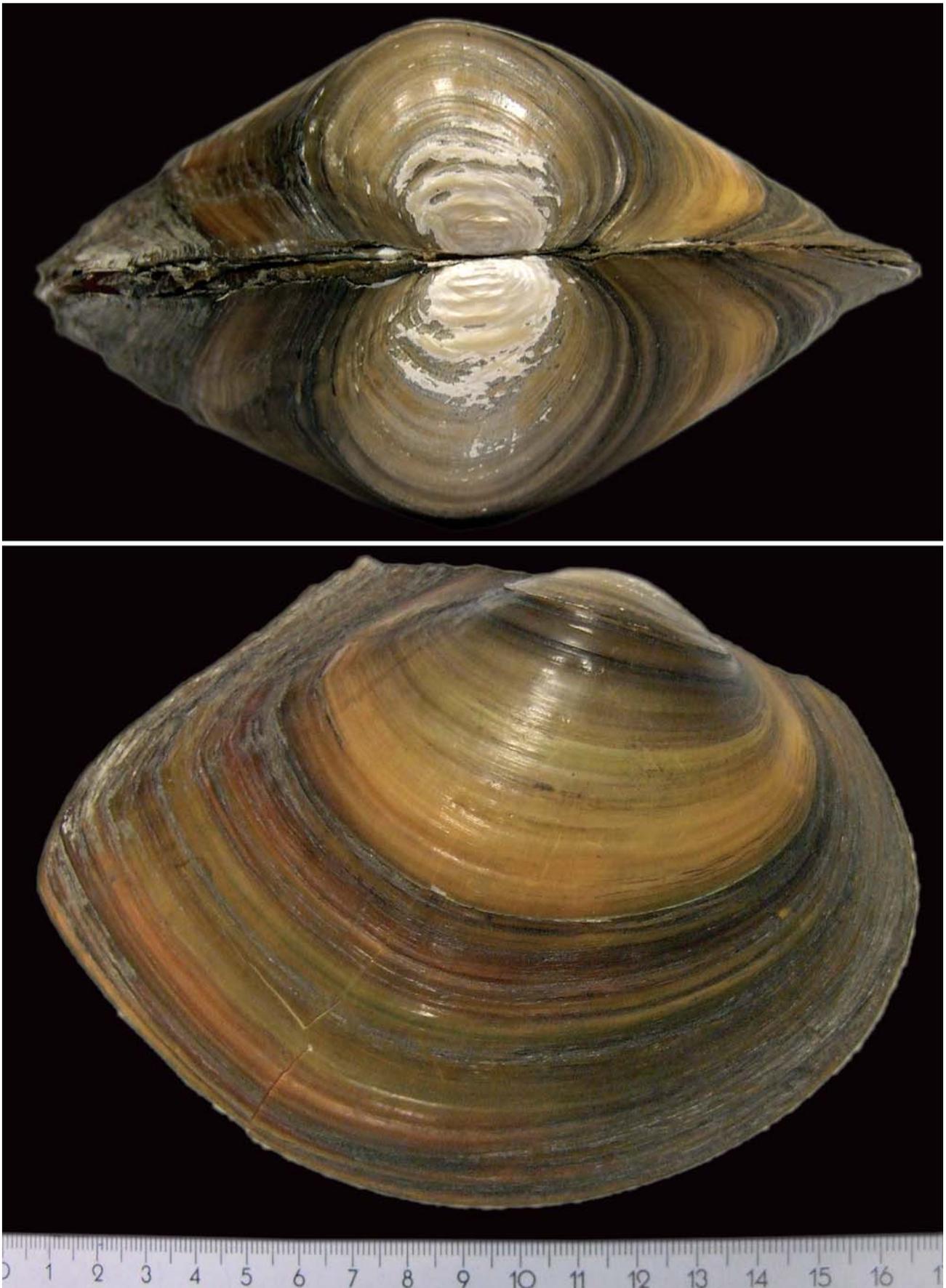


Fig. 2. *Sinanodonta woodiana* (Lea, 1834) collected from the Czesławicki Pond



The reason explaining the appearance of the Chinese clam is the repeated stocking of the Czesławicki, Augustyn and Głęboki ponds with the Silver Carp and Grass Carp brought from the ponds of the Gosławice fish-farm near Konin (K. GIRUS pers. comm.). Among all the fishponds of the Janisławice complex, the Czesławicki Pond (with the largest population of Chinese clam) in the summer has the warmest water; it is shallow and much less shaded than the other ponds.

The data suggest that previously the Chinese clam appeared in Poland only in heated waters, the high temperature being indispensable for its development (KRASZEWSKI & ZDANOWSKI 2001, DOMAGAŁA et al. 2003, KOŁODZIEJCZYK 2004, KRASZEWSKI 2006). Therefore, the appearance of *Sinanodonta woodiana* in the ponds of the Barycz River Valley whose waters have not been heated is particularly interesting. However, we cannot rule out the possibility that the presence of the abundant population of the clam in the new sites is associated with the recent anomalies of air

and water temperature (e.g. KOCZOROWSKA 2003, 2005), higher than the annual average and particularly favourable for the development of this species.

It is essential that the species should be closely monitored in order to determine the tendencies of its population dynamics and the possibilities of its expansion in other waters of the Dolina Baryczy Landscape Park.

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