First record of the stone crayfish *Austropotamobius torrentium* (Schrank, 1803) (Crustacea: Decapoda: Astacidae) from Saxony (Germany)

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**Abstract.** Till recently, the stone crayfish *Austropotamobius torrentium* (Schrank, 1803), a highly endangered crayfish species, was still considered as nonexistent in the federal state of Saxony (Germany). Carrying out a regional crayfish monitoring in summer 2007, however, we surprisingly caught five specimens in a small brook on the southern outskirts of the Saxon capital of Dresden. This is the first record of the stone crayfish from Saxony, which represents its northernmost habitat known to date.


**Key words.** *Austropotamobius torrentium*, Saxony, natural range, northernmost habitat

**Introduction**

The stone crayfish *Austropotamobius torrentium* (Schrank, 1803) is one of the most threatened species in Europe (e.g. Streissl & Hödl 2002a). Water pollution, habitat destruction, and the lethal crayfish plague *Aphanomyces astaci* (Schikora 1906) have brought the stone crayfish to the brink of extinction (Füreder & Machino 1998). Thus, *A. torrentium* was listed in the appendix II of the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Habitats Directive) as a species of community interest whose conservation requires the designation of protected areas for habitat conservation (Taylor 2002; Strätz 2007).

In Saxony, a federal state situated in the south-eastern part of Germany bordering Poland and the Czech Republic, the occurrence of only four crayfish species were known till recently (Füllner et al. 2005): The indigenous noble crayfish *Astacus astacus* (Linnaeus, 1758), the eastern European narrow-clawed crayfish *Astacus leptodactylus* (Eschscloltz, 1823), the spiny-cheek crayfish *Orconectes limosus* (Rafinesque, 1817) and the signal crayfish *Pacifastacus leniusculus* (Dana, 1852), two species originating from North America. The stone crayfish was regarded as nonexistent in the Saxon area until now due to the large distance to the known natural range which has its northernmost extension in the drainage basin of the river Main (Gross 2002) (Fig. 1).
Study site and sampling

The discovery location of the stone crayfish is a small brook situated in the southern outskirts of the Saxon capital of Dresden (13°53’E, 51°01’N). The water rises in the uplands of the Schönfelder Hochland at an altitude of 300 m and flows 200 m downward to the river Elbe.
At two locations, the brook flows through a small retention pond. The total stream length is 3.5 km, the width ranges from 0.5 to 1.5 m and the average depth is about 10 cm. The streambed is well-structured by stones, potholes and roots. The region around the headwaters is dominated by fields and grasslands while the mouth of the stream lies in a built-up area. The intermediate sectors are situated in a deciduous forest, which is part of a nature reserve already protected by the Habitat Directive.

For the first time, we carried out stone crayfish sampling during a regional freshwater crayfish monitoring by using commercial traps in summer 2007. Twenty traps were set in a brook section of approximately 250 m. Because of the generally low water level, the sampling was repeated by catching the animals by hand in autumn. Captured animals were sized, weighted and their sex was determined before being released again. In addition, during the second collection in autumn we took tissue samples from the animals for further genetic analysis without killing or seriously injuring them.

**Results**

The trap sampling yielded only five adult stone crayfish consisting of four females and one male (Figs 3–5), ranging from 6.0 to 7.0 cm. The specimens were mainly caught in potholes as the other sections of the brook were too shallow for setting the traps properly. In autumn, we caught 25 specimens by hand in a section of 100 m. To avoid greater damages to the habitat, we only turned smaller stones for seeking the stone crayfishes. Because of the relationship between stone size and crayfish length (Streissl & Hödl 2002b), we mainly captured specimens ranging only from 3.0 to 5.0 cm. However, we also found three berried females of 7.0 cm (Figs 3–5).
Discussion

The occurrence of the stone crayfish, coincidentally detected in the periphery of the city of Dresden, is the first record of this species in Saxony and the northernmost place where this species has been found yet. According to the Habitats Directives evaluation scheme for stone crayfish population, given by TROSCHEL (2006), the abundance of more than 20 specimens caught per 100 m, the ratio of berried females of more than 5%, and the generally good habitat conditions allow us to classify the status of this stock as “good”. In addition, the major part of the area is already strictly protected by the Habitats Directive. Nevertheless, due to the low reproduction rate of the stone crayfish (BOML. et al. 2001) and its spatially limited habitat, the
only population in Saxony known so far continues to be endangered. Even the slightest disturbance could lead to its total extinction. Thus, precautionary measures are necessary to avoid potential water contamination by fertilizers or insecticides from the agricultural land in the upper part of the locality or to prevent an invasion of the spiny-cheek crayfish, the main carrier of the crayfish plague (Odttmann & Hoffmann 1998) from the nearby river Elbe.

Further, it has to be regarded whether the detected Saxon population is an autochthonous one. In spite of intensive literature research, we could not find any information about a historical occurrence of *A. torrentium* in this region. Due to that fact and because of the long distance to the main distribution area, one could assume that the Saxon population has been introduced by man. On the other hand, the reason for the lack of past evidence could also be due to the fact that the small-sized stone crayfish has often been ignored because of its commercial irrelevance. It could also have been easily confused with other crayfish species. For example, some scientists considered *A. torrentium* an atrophied form of the noble crayfish, even until the beginning of the 20th century (Smolian 1926).

However, the latest data from the Czech Republic and northeastern Bavaria (Kozák et al. 2002; Fischer et al. 2004; Stratz 2007; Franek, personal communication) suggest that the natural distribution of the species also includes the drainage basin of the river Elbe (Czech: Labe) (Fig. 1). In contrast to Machino & Fureder (2005), who assume that the occurrences in the Czech Republic are anthropogenic, we assume that the Bohemian habitats are remaining populations of a past natural stock which widely disappeared because of the detrimental effects of the early industrialization in the middle of the 19th century in the region. Thus, we conclude that the Saxon stone crayfishes represent such a relict population as well. We are expecting more clarification of this problem by the genetic analysis of the obtained tissue samples, which will be carried out soon.

It is still in question whether the stone crayfish in Saxony is of anthropogenic origin far outside its natural range or whether it is an autochthonous relict population.

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### References


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