Notes regarding the presence of some *Podarcis muralis* (Laurenti 1768) populations on the railroads of western Romania

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Abstract. *Podarcis muralis* is present on the railroad embankments and bridges from the train stations in some areas of western Romania. Sometimes these populations are in close vicinity to natural habitats, whilst at other times may be several km away. In the second case, they are probably brought accidentally, along with the rail stones. It is likely that the species, at the northern limit of its distribution, is advantaged in some way by the railroads, which offer numerous shelters and the possibility of much quicker thermal adjustment.

Key Words: *Podarcis muralis,* distribution, railroad, western Romania

Podarcis muralis occupies middle to southern European-Anatolian distribution (Guillaume 1997). Romania lies at the north-eastern limit of this area, with *P. muralis* being distributed mostly in the southern and central region of the Carpathian Mountains, without reaching their northern sector (Iftime 2005). In Romania, the species prefers rocky habitats, quarries and walls and is considered xero-thermophilic (Fuhn-Vancea 1961) despite the fact that in the southern regions it inhabits humid areas (Mayer & Beyerlein 1999). Due to the rarity of its habitats, the species is quite uncommon in Transylvania and the western part of Romania (Ghira et al 2002).

In western Romania, several *Podarcis muralis* populations were highlighted recently, distributed coterminous to the Apuseni Mountains (Covaciu-Marcov et al 2003 a, b, b, 2005, 2006), inhabiting mostly natural rocky environments or quarries but also, on rare occasions, in edges of forests or the edges of some forest roads. However, in the western part of Romania, the species was documented in atypical habitats such as near, or even on, the embankments of train stations. Thus, the common wall lizard was observed on the railroads that cross the Mures and Crisul Repede narrow paths (Covaciu-Marcov et al 2003, 2005). Subsequently, we encountered other

populations of *Podarcis muralis* on the railroads from the western part of Romania, their localities being indicated in fig. 1.

The species is distributed almost continuously on the railroad that crosses the Crisul Repede narrow path, on a length of aprroximately 20 km, between Vadu Crisului and Bulz. However, it is not very abundant due to the rather shadowed valley with steep slopes around it. In the valley of the river Mures, however, it is more numerous, thanks to the presence of favorable habitats. We observed *P. muralis* here in a number of localities, at Radna being present even on the passing from above the train station (Covaciu-Marcov et al 2005). The presence of the species in the two areas isn't surprising, simply because that the railroads often pass by rocky mountainsides, typical for the species. This is how the common wall lizard's habitat and the railroads are neighboring each other, making it very easy for the lizards to pass onto the embankments. The exact same causes allow some specimens to reach the railroad that follows the Crisul Alb River, in the Talagiu – Varfuri area.

In western Romania there are also "railroad" populations of *Podarcis muralis* (fig.2), situated large distances from their characteristic habitats. The species is present at the ground level and on the bridge that crosses over the Arad train station, approximately 25 km from the specie's area (Covaciu-Marcov et al. 2005). In 2006 we observed several specimens on the rails from the Simeria Triaj strain station as well. The later is situated at about 3 km south of the town of Simeria, being a very important railway selector, with numerous lines. The observations were made in October, when the lizards were basking on the embankment, apparently undisturbed by the train. In the case of the populations from Arad and Simeria Triaj, no link with any natural habitat can be found, since the site is a few km away from their typical environment. Further more, the population from Simeria Triaj lies in a very vast railroad complex. The most plausible explanation of the presence of the species in these areas is the accidental transportation of some specimens from different quarries together with the rail stones. The unintentional introduction was raised in other situations, too, both in Romania (Torok 2001, Iftime 2005) and I other regions from the specie's areal as well (Rathbauer 2002, Hill & Mayer 2004). However, at least at least in the case of the population from Simeria, we cannot exclude the direct migration of the species alongside the railways, since numerous other populations of *Podarcis muralis* existing in the region (Ghira et al 2002).

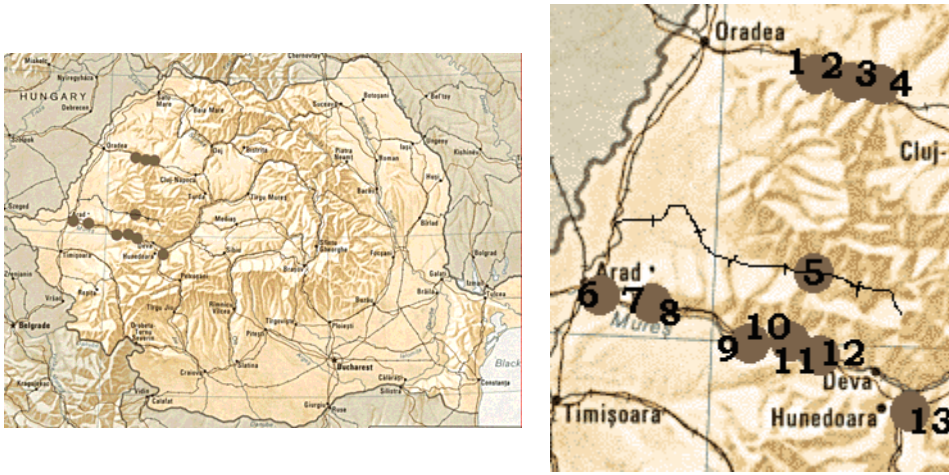

Figure 1. The geographical position of "railroad" populations of *Podarcis muralis* in western Romania (Bihor county: 1.-Vadu Crişului, 2.-Şuncuiuş, 3.-Bratca, 4.-Bulz; Arad County: 5.-Vârfurile, 6.-Arad, 7.-Radna, 8.-Şoimoş, 9.-Vărădia de Mureş, 10.-Hălăliş, 11.-Săvârşin, 12.-Cuiaş; Hunedoara county: 13.-Simeria Triaj)

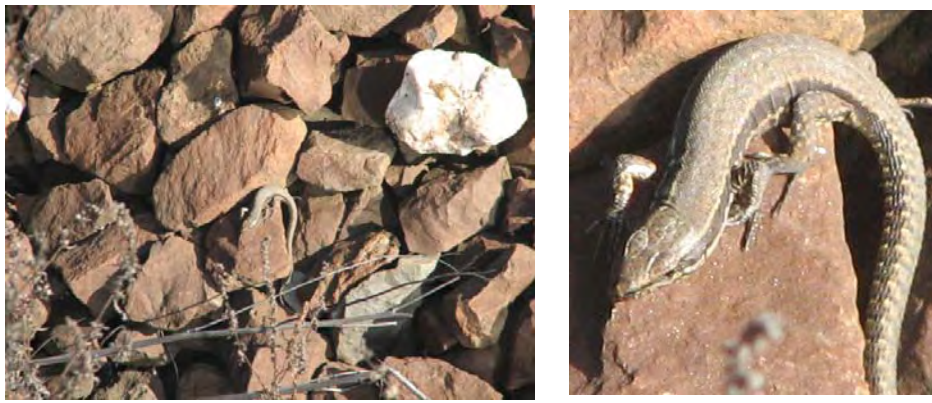

Figure 2. *Podarcis muralis* individual from a "railroad" habitat (Simeria Triaj, Hunedoara county) (photo by: Horia Bogdan, CHO, 2006)

The railroad populations of *Podarcis muralis* seem unaffected by the railway traffic, people or cars that cross the bridge over the Arad train station. The presence of this species despite the life in towns and implicitly higher anthropogenic impact has been previously documented (Clark

1989, 1992, Toth et all 2006). At least on the railroads, this adjustment can be explained by the occurrence of plentiful shelters in the proximity of the animals. Previous research has shown that the common wall lizard's reaction is directly proportional with the distance from a potential refuge – the farther the refuge, the quicker the reaction (Amo et al 2003). In the case of the railroad populations, the presence of the shelters can decrease the anthropogenic pressure. This fact is essential for the survival of these populations because it has been documented that a high frequency of anti-predatory behaviors leads to a decrease in body condition, with lizards treating humans as predators (Amo et al 2006). Probably, again because of the offered refuges, the railroads are also used by other species of the Podarcis genus, for example *Podarcis taurica* (Cruce 1971).

At the same time, life on the railroads can have its advantages, especially in autumn, when the lizards spend a lot of time basking. Maintaining the body temperature is a consequence of the environment which also determines the selection of some thermally favorable micro-habitats (Grbac & Bauwens 2001). Most likely, on the railroads the time required for reaching optimal body temperatures can be considerably shorter due to the much faster heating of these continuous surfaces of rock and metal. As a result the lizard's higher temperature allows faster movement and sensing of predators (Amo et al 2004).

At least theoretically, the railroads offer the lizards a larger number of refuges and possibilities of basking in comparison to a natural habitat. This fact could be an advantage at the northern limit of this specie's distribution, where *Podarcis muralis* finds few favorable conditions and places. It is probable that these facts can explain the survival of the railroad populations in these conditions of anthropogenic stress, because in the Crisul Repede narrow path there have been known populations ever since 1998. In the same time, at its northern border of its distribution, where the species is strictly limited to rocky mountainsides and low altitudes, the railways can represent a means of widening their occupied territory.

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