

The Common Wall Lizard,
Podarcis muralis (LAURENTI, 1768),
new to the province of Salzburg
(Austria). Origin of a paraneozoon

The range area of the Common Wall Lizard *Podarcis muralis* (LAURENTI, 1768) is the largest within the genus and extends from northern Spain in the west to Romania and northwestern Turkey in the east, and from the Netherlands in the north to southern Italy in the south (GRUSCHWITZ & BÖHME 1986; SCHULTE 2008). In Austria, *P. muralis* was previously documented in all provinces except Salzburg (CABELA et al. 2001; ASCHAUER et al. 2008). Populations in the east, southeast and south (Lower Austria, Vienna, Burgenland, Styria, Carinthia, East Tyrol) are represented by the nominate form *P. m. muralis*, while North Tyrolian populations are related to the subspecies *P. m. maculiventris* (WERNER, 1891). These populations are well known for more than a century (CABELA et al. 2001) and considered autochthonous, also due to molecular data (SCHULTE 2008; SCHWEIGER et al. 2011, submitted), whereas in the provinces of Upper Austria (*P. m. maculiventris*, *P. m. nigriventris* BONAPARTE, 1836; WEISSMAIR & MOSER 2008) and Vorarlberg (*P. m. maculiventris*; ASCHAUER et al. 2008) only introduced populations were detected. These latter populations showed mitochondrial haplotypes which were distinctly different from all other Austrian samples investigated and were detected only recently.

Individuals of populations of native or non-native taxa outside of their natural range, which are established since at least 25 years, are called paraneozoa (GEITER et al. 2001). *Podarcis muralis* is an example for this kind of active or passive dispersal in many parts of Europe and the USA (SCHWEIGER & DEICHSEL 2003; KÜHNIS & SCHMOCKER 2008; SCHULTE et al. 2008). Apart from the natural process of expansion by migration, paraneozoa populations can either be established actively and deliberately by releasing individuals in the wild, by unintentional escape from captivity, or by passive dispersal via traffic and railways, and may thrive or even expand if habitats are suitable (BURKE & DEICHSEL 2008; SCHULTE et al. 2008).

We present data on the first record of an introduced *P. muralis* population in the Austrian province of Salzburg. The site is located at the railway station of "Steindorf bei Straßwalchen", close to the border to Upper Austria (47°58'00"N, 13°14'18"E; Fig. 1). Wall lizards were discovered and identified by one of the authors (AH) in the year 2008 and may have been present there since at least 2005, according to information provided by locals.

The animals inhabit a ruderal area of approximately 10.000 m², formed chiefly by the periphery of railway tracks, walls of the railway station and a storage area (Fig. 2). It is not known whether this population originated from a deliberate introduction or was founded by individuals dispersed by train. The latter possibility seems more likely though, as "Steindorf bei Straßwalchen" is a highly frequented railway station for national and international freight trains, for instance from North Italy via the Brenner railway and North Tyrol.

DNA-analyses were carried out to reveal the origin of the individuals that established this population. Therefore, tissue of one temporarily captured individual was obtained by buccal cell sampling with sterile cotton buds (POSCHADEL & MÖLLER 2004). Total genomic DNA was extracted using the NucleoSpin® Tissue Kit by Macherey-Nagel (Düren, Germany). A segment of 887 bp of the *cytochrome b* gene was amplified by PCR (primers: "L3a" 5'-TTTGATCCCTGTAGGCCTCTGTT-3' and "H-15150" 5'-ATAATAAAGGGGTGTTCTACTGGTTGCC-3') and sequenced (primers "H-14776" 5'-GGTGAATGGGATTTTG TCTG-3' and "L4" 5'-AGGCACCTCCATAGTTCACC-3') (PODCHAR et al. 2004; PODCHAR et al. 2007) by LGC Genomics (Berlin, Germany) sequencing service. The obtained sequence was compared with homologous regions of sequences from samples scattered over most of the area of *P. muralis*, which were analyzed in the course of a comprehensive genetic analysis of the species (SCHWEIGER et al. 2011 submitted). The sequences most similar to the sequence of the Steindorf sample were from individuals collected in Liguria and the Po plain, northern Italy (Southern Alps clade, SCHWEIGER et al. 2011 submitted). The investigated speci-

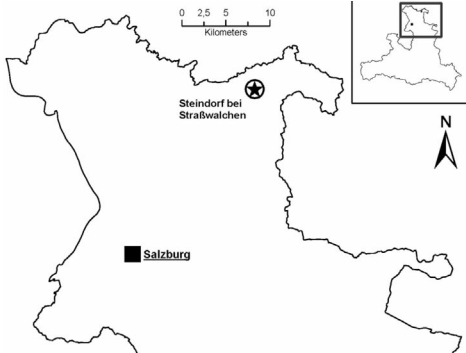


Fig. 1: Position of Steindorf bei Straßwalchen, the first record locality of *Podarcis muralis* in the province of Salzburg, Austria.



Fig. 2: Habitat of *Podarcis muralis* at the railway station of Steindorf bei Straßwalchen (Salzburg, Austria).

men from Steindorf shows a haplotype different to all other investigated samples from the region of the respective haploclade.

Based on the red underside of the individuals (Fig. 3), and the features of the haplotype detected, we hypothesize that this allo-



Fig. 3: Ventral side of the *Podarcis muralis* specimen sampled at the railway station of “Steindorf bei Straßwalchen” (Salzburg, Austria). The individual was released after sampling.

chthonous population originates from the region of the Lake Maggiore, or the Lake Garda (northern Italy) and represents *Podarcis muralis maculiventris*.

Wall lizards are listed in Annex IV of the EU-Habitats Directive (Council Directive 92/43/EEC) and therefore subject to strict protection. Future survival prospects of this introduced population might be poor due to planned modernization measures in their habitats in the nearest future. On the other hand, there is little knowledge on the impact of introduced wall lizards on populations of native lacertids like the Common Lizard, *Zootoca vivipara* (JACQUIN, 1787), and particularly the Sand Lizard, *Lacerta agilis* LINNAEUS, 1758. There is some evidence that introduced *P. muralis* are able to suppress or even replace *L. agilis*, especially when habitats are highly urbanized or under intensive agricultural use (e.g. STEINICKE 2000; KÜHNIS & SCHMOCKER 2008; SCHULTE et al. 2008). Currently, the only further reptile species documented in this area is the Smooth Snake, *Coronella austriaca* LAURENTI, 1768, but the surroundings were not thoroughly surveyed. The occurrence of native lizard species will be subject to future investigations in connection with studies on population size and viability, as well as, opportunities for spreading of *P. muralis* in the vicinity of the current habitats.

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AUTHORS: Andreas MALETZKY, Anita HATTINGER, Karin MOOSBRUGGER, University of Salzburg, Department of Organismic Biology, Heilbrunnerstraße 34, A-5020 Salzburg, <andreas.maletzky@sbg.ac.at > <anitamaria.hattinger@sbg.ac.at > <karin.moosbrugger@sbg.ac.at >; Silke SCHWEIGER, Natural History Museum Vienna, Herpetological Collection, Burgring 7, A-1010 Vienna, <silke.schweiger@nhm-wien.ac.at >