

## **Der Einsatz von Pflanzenschutzmitteln in Deutschland: Auswirkungen auf Enzymaktivitäten und Populationsstruktur einheimischer Reptilienarten am Beispiel der Mauereidechse (*Podarcis muralis*)**

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### **The use of plant protection products in Germany: Effects on enzymatic activity and population structure in reptiles by the example of the common wall lizard (*Podarcis muralis*)**

Reptiles belong to a group of vertebrates that is globally affected by biodiversity loss. While the underlying causes are highly assorted, environmental pollution (especially in form of pesticides) and habitat loss are recognized as the leading factors for these declines, especially in agricultural landscapes. The reptile order Squamata has thus far been largely neglected whilst studying effects of pesticides on reptiles, whereas the main focus has been given to the orders Testudines and Crocodylia. Overall, reptiles are highly underrepresented in ecotoxicological studies assessing effects of pesticide exposure in vertebrates. Therefore, information regarding potential effects on their organisms, as well as exposure probability and pesticide uptake in the Reptilia has to be considered rather uncharted. Our focus lied in how pesticide applications affect a widely distributed squamate species in Europe. We studied the common wall lizard (*Podarcis muralis*) with regard to enzymatic biomarkers of pesticide exposure (Glutathione-S-Transferase, Glutathione Reductase, Acetylcholinesterase) and body condition. Lizards were sampled from wild populations, along an exposure gradient (three sites with differing land use intensity and one reference site). Our results show a clear impact of pesticide exposure on enzymatic activity of individuals. Body condition of lizards decreased with increasing exposure and gender distribution was skewed in favor to males within exposed populations. Many reptile species regularly come into contact with pesticides and can be expected to suffer from oral and dermal exposure. Thus, we see that it is indispensable for reptiles to be integrated into risk assessments in order to improve conservation practice.

**Key words:** Non-target organism, agriculture, reptile, *Podarcis muralis*, plant protection products, vineyard.

### **Zusammenfassung**

Reptilien sind eine global von Diversitätsverlust gefährdete Wirbeltiergruppe. Die Ursachen sind divers, allerdings gelten Umweltverschmutzung (insbesondere in Form von Pestiziden) und Habitatverlust (vor allem in landwirtschaftlichen Gebieten) als Hauptursachen. Squamate Reptilien wurden bei Untersuchungen bezüglich der Auswirkungen von Pflanzenschutzmitteln auf Reptilien bis heute stark vernachlässigt. Hier lag der Hauptfokus in der Vergangenheit auf den Ordnungen der Schildkröten und Krokodile. Reptilien sind bei ökotoxikologischen Studien, die sich