SHORT TERM SCIENTIFIC MISSION (STSM) SCIENTIFIC REPORT

This report is submitted for approval by the STSM applicant to the STSM coordinator

Action number: CA18221

STSM title: Reptiles’ life history traits in relation to pesticides

STSM start and end date: 17/06/2021 to 15/07/2021

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| **PURPOSE OF THE STSM:** |
| (max.200 words)  The purpose of my STSM was to contribute to the Pesticide Risk Assessment for Amphibians and Reptiles (Action PERIAMAR) by gathering and updating the information on life history traits of reptiles living within the European continent. This information, compiled in a database, is the basis of analysing the effects of pesticides on reptiles’ life history and will serve to propose reptilian focal species to be used in the environmental risk assessment of pesticides to this group of animals. |

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| **DESCRIPTION OF WORK CARRIED OUT DURING THE STSMS** |
| (max.500 words)  The focal taxonomic group of my work were lizards, sensu lato, i.e. Order Squamata with the exception of Suborder Serpentes.  Based on the results of a previous STSM, conducted by Matteo Lattuada, which studied the occurrence of amphibian and reptile species in agricultural areas across Europe, I’ve chosen the most representative lizard species for different agricultural habitats (agroforestry, dry fields, irrigated fields, woody fields and pastures) and have taken into account both taxonomical and geographical considerations. While the initial idea was to analyse the 15 most common species across Europe, the final analysed species list includes 30 lizard species, in order to provide coverage to as many geographical regions in Europe as possible.  In the second stage of my STSM, I’ve elaborated a search string based on the list of traits that were included in the life history trait datamodel deliverable of CA18221 (available at <https://periamar.com>), but I’ve also added a few new trait keywords which I’ve considered useful based on past literature review.  For each lizard species I used this search string to extract information from multiple sources:  (i) databases of reptiles’ life history traits  (ii) literature on chosen species’ life history traits (accessed through Scopus, Web of Science, and Google Scholar).  For each species and life stage, I have searched for information on 35 life history traits ranging from general biological measurements (snout to vent length, total length, width, mass), reproductive information (sexual maturity, reproductive effort, egg measurements, clutch measurements) to metabolic data. All the extracted information was compiled in a comprehensive database using the abovementioned datamodel. |

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| **DESCRIPTION OF THE MAIN RESULTS OBTAINED**    1. ***Species list***  I have analysed data on 30 European species of lizards distributed in 6 Squamata Families (Lacertidae, Anguidae, Gekkonidae, Amphisbaenidae, Scincidae and Iguanidae). The species were chosen based on:  (i) literature mentions of species in agricultural habitats – the most representative species based on this criteria being *Lacerta agilis* and *Zootoca vivipara* with over 3000 mentions, *Podarcis muralis* and *Anguis fragilis* in over 2800 mentions.  (ii) taxonomical considerations – because of different ecological and biological functions in the ecosystem, at least one representative species of each taxonomical family was chosen even if references in the literature were rare, such as *Blanus cinereus* from family Amphisbaenidae, with only 265 mentions or *Stellagama stellio* from Iguanidae, with only 125 mentions  (iii) geographical considerations - best similar species which is representative for different parts of Europe i.e. from Scincidae family I have chosen both *Chalcides* sp. for western Europe and *Ablepharus* sp. for eastern Europe)  Because of recent taxonomical changes I have grouped these 30 chosen species in 19 “species groups”. i.e. *Anguis* group from Anguide includes the *Anguis fragilis* complex species (*A. fragilis, A. colchica, A. veronensis, A. graeca, A. cefalonica)* (doi:10.1163/15685381-00003133)and even though the information gathered in this STSM was done separately for each species, these should be analysed together as per their chosen “species group”.  2. ***Life history traits and search string***  The initial trait list considered for the life-history trait database in a previous deliverable of CA18221 contained 25 traits for both amphibians and reptiles’ life histories. Based on literature review regarding environmental factors which affect lizard life-history, I have added to this list the following traits: snout vent length at sexual maturity, clutch mass, percentage of successful hatchings, egg length, egg diameter, egg mass, time of egg development, sprint speed, maximum range/dispersal distance, reproductive energy investment. As such, the final trait list for lizards includes 35 traits relative to growth, maturity, reproduction, metabolism and other physiological and physical traits.  Information on each trait for each species was searched on Scopus, Web of Science and Google Scholar using a predefined search string such as “species name” + “trait”. Any useful information was extracted and written in the HerpTrait\_database document created in excel.  Also, two databases on reptile traits, with over 240 referenced articles in total, were integrated in the HerpTrait\_PERIAMAR database: Grimm et al., 2014 (doi: 10.3897/natureconservation.9.8908) with general information on reptile traits and Telea et al. (unpublished) with information on age and growth parameters.  3. ***HerpTrait\_Periamar* database**  The database contains over 1200 entries for all 30 species. For traits which have been more studied, such as lizard length, I have created an entry for each different reference and each different location, as geographical differences can affect life history.  Traits with no information found have been left blank for easy viewing of subjects in which future studies are possibly necessary.  The database “HerpTrait\_PERIAMAR”, in excel format, is being delivered to the PERIAMAR Core Group, for it to contribute to future work within the Action. |
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| **FUTURE COLLABORATIONS (if applicable)**    Until now, my general research focus was on characterization of reptile population adaptations and trade-offs to environmental constraints. I aim to continue on this path, but taking into consideration the impact of agrochemicals on reptiles and identifying, whenever possible, how life-history traits modify as a consequence to short- and long- term exposure to such substances. |
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