Report on the outcomes of a Short-Term Scientific Mission[[1]](#footnote-1)

Action number: CA 18221

Grantee name: Geanina Fănaru

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| **Details of the STSM**  Title: Feasibility of ecological mesocosm to environmental risk assessment (ERA) of pesticides on reptiles. A pilot test with wall lizard adults  Start and end date: 10/06/2022 to 02/08/2022 |
| **Description of the work carried out during the STSM** |
| *(max. 500 words)*  The present STSM main objective was a pilot study to test the viability of the experimental design of mesocosm on lizards and to establish the improvements needed for evaluating the impact of pesticides on reptile species using a mesocosm-controlled environment.  The experiment design consisted of 16 mesocosm environments and the model species we worked with was *Podarcis bocagei*, a widespread insectivorous lacertid present also in agricultural areas. The mesocosms consisted of large plastic containers (750 L volume) with sand and rocks used as substrate. The rocks also helped to easily drain excess water. Terracotta building bricks were set in the mesocosm for the lizard to use as a shelter, refuge, or basking. A net was used to cover each mesocosm, to prevent the entrance of predators. Spontaneous vegetation was allowed to grow and only occasional management was done to avoid overgrowth. The mesocosm was sprayed daily for 15 minutes with an automated irrigation system.  Out of the 16 mesocosms, 4 where considered control environments (CME) and other 12 experimental environments (EME). In the CME we had no lizards and in EME we had 3 *P. bocagei* lizards: 1 male and 2 females. Lizards were fed once every 5 days with 2 mealworms (*Tenebrio molitor* larvae)/lizard and were also left to eat wild invertebrate prey.  Every 2,5 weeks lizard were extracted from the mesocosms when inactive and we took measurements of body mass (BM) and snout-vent length (SVL). At the same time, lizards were inspected for signs of pregnancy. The visible pregnant females were moved into the lab in a ”nest box”: a box with a substrate to ensure the controlled laying of the eggs by the females. The temperature in the lab was set at 26°C and the humidity was provided by spraying manually the substrate and the box daily. Water was provided daily for these pregnant females and were fed every 2 days with 2 mealworms/lizard. When eventually females laid eggs, these were moved to an incubator until hatching at 27,5°C and 80% humidity.  Afterward, the hatchlings were kept in individual boxes and fed daily for the first week with 4 little mealworms larvae and then continued a feeding scheme according to their growth and size. In the first week measurements were taken of BM and SVL. The measurements were continued according to the measurement scheme for adults every 2,5 weeks.  Grantee enters max 500 word summary here. |
| **Description of the STSM main achievements and planned follow-up activities**  *(max. 500 words)*  Out of the total of 12 males and 24 females used in this pilot test, during the 2 months, 5 females and 2 males died due to unknown causes, while the others stay in the mesocosm to date. The males and females were from different mesocosms and one of the females was pregnant. Dead animals were replaced with other lizards captured in the same area as the ones that died.  In all 11 females (45,83%) got pregnant during the experiment from 8 mesocosms. In the 2 mesocosms with dead males there were 3 females pregnant.  The females laid 2-5 eggs. From a total of 36 eggs laid, 8 successfully hatched, 15 were unviable and removed from the incubator and 13 are in the incubator waiting to hatch. The ones unviable were removed because they were affected by fungi or dried out.  The measurements of the adults showed a decreasing trend in BM for both males and females. At the first measurements, the BM of females was an average of 2.86 and for males 4.20. After 95 days the BM average for females was 2.44 and for males 3.79.  Measurements revealed that both female and male lizards lost weight compared to the moment when they were introduced into the mesocosm suggesting that natural and splintery food was insufficient. Females were also laying eggs in the middle of the period which could be an answer to this weight loss. Additionally, food diversity provided to females and males kept in both, mesocosms and in the lab had an impact on the weight they gained.  In conclusion, this pilot test was successful in the regard that we evidenced the problems encountered in an experimental mesocosm environment with lizards, without the effect of pesticides.  The next step is to finish analysing all the data and solve the encountered problems and errors, in order to be sure that the actual experimental design with the appliance of pesticides will be controlled for errors because of fluctuations in environmental conditions (temperature, humidity) and food availability. The present study results could be considered a control experiment for future treatments of lizard mesocosm experiments. This study is part of WG2 - Ecosystem-level assessment, Task 2.4 “Estimating indirect effects of pesticides on amphibian and communities” of PERIAMAR.  Grantee enters max 500 word summary here. |

1. This report is submitted by the grantee to the Action MC for approval and for claiming payment of the awarded grant. The Grant Awarding Coordinator coordinates the evaluation of this report on behalf of the Action MC and instructs the GH for payment of the Grant. [↑](#footnote-ref-1)