Ljubljana, 04-05/03/2020

# Subject │ Minutes of the First Working Groups 1, 2, 3 and 4 Meetings of COST Action CA18221: “PEsticide RIsk AssessMent for Amphibians and Reptiles”

1. **Welcome to participants**

The participants (**Annex 1**) were welcomed by Manuel Ortiz Santaliestra, Chair of the Action, and the Local Organizers, Anamarija Žagar, Martina Lužnik and David Stanković.

1. **Adoption of agenda**

The agenda (**Annex 2**) for the meeting was adopted.

1. **Update from the Action Chair**

The Chair presented the objectives of the action, its milestones and deliverables, and the objectives for the meeting. These objectives were:

* Define the main challenges to address within each task or WG.
* Propose networking activities to address the defined challenges, especially for tasks of higher priority according to the Action timeline.
* Gain support from open discussions among WGs.
* Establish links among Action participants (first step to share future PERIAMAR activities or future projects out of the Action framework).

1. **Review of the state of the science relative to WG1 tasks**

Andreas Focks and Andreu Rico, leaders of task 1.1, presented an overview of TK/TD models applicable to herpetofauna to determine the relative importance of exposure routes and scenarios.

Manuel Ortiz, on behalf of the leader of the task 1.2, Cecilia Berg, presented an overview of the toxicity endpoints commonly addressed in herpetofauna and a proposal for integration of effects at different levels of biological organization.

David du Pasquier, leader of task 1.3, reviewed the standard toxicity tests available for herpetofauna, all of them focused on amphibians.

1. **Definition of WG1 objectives for Grant Period 2**

The proposed goals of WG1 for GP2 were:

* Investigate the relative importance of the different exposure routes to each group and life stage.
* Investigate the options for combining the exposure through different routes into a single exposure indicator value and explore whether this approach can result in risk overestimation.
* Review further the information on toxicological sensitivity of amphibians and reptiles to determine which traits may account for increased sensitivity and whether chemical-related trends in sensitivity exist.

1. **Proposal of WG1 networking activities for Grant Period 2**

Working Group 1 proposed the following networking activities:

* A WG meeting together with WG2 to establish all potential field scenarios for herpetofauna exposure to pesticides and to consider, list and prioritize exposure routes for the different groups and life stages. Dusko Blagojević (University of Belgrade, RS) volunteered to organize this WG meeting.
* Four STSM addressing the following scientific priorities:
  + Parameterize variables relevant to exposure models (e.g. skin absorption rate, etc.), using GUTS model for this purpose. TK/TD modelling for combining exposure routes into an internal body burden. Test the applicability of these models using published literature on toxicological sensitivity of amphibians. Andreas Focks (Wageningen University and Research, NL) was proposed as host for this STSM.
  + Review the suitability of US EPA exposure models to estimate the relative importance of different exposure routes.
  + Update and review data on toxicity of amphibians and reptiles, and perhaps also of surrogates, from both published and unpublished sources. Identify the most urgent gaps to be approached. Valbona Aliko (University of Tirana, AL) was proposed as host for this STSM.
  + Ecotoxicity on amphibians and reptiles at biochemical levels (including omics). It was proposed to wait for the result of the previous STSM (update and review toxicity data), before taking a decision on the suitability of this STSM.

1. **Review of the state of the science relative to WG2 tasks**

Wim Beltman, co-leader of task 2.3, presented the steps necessary to model pesticide concentrations in a new scenario representative of an amphibian breeding temporary ponds, different from current FOCUS scenarios, which are little relevant to those specific water bodies. It was agreed to postpone the execution of this task 2.3 to Grant Period 3 (starting on 01 May 2021).

Neftalí Sillero, leader of task 2.1, presented the preliminary results of the STSM being held by Matteo Lattuada, about herpetofauna distribution in agricultural landscapes across Europe.

Marta Biaggini, leader of task 2.2, reviewed the available information on amphibian and reptile field ecology, including phenology, spatial ecology and diet, which is important in determining the potential exposure of herpetofauna to pesticides in their natural habitats.

Miguel Carretero, leader of task 2.4, presented the bases to address indirect effects of pesticides to amphibians and reptiles.

1. **Definition of WG2 objectives for Grant Period 2**

The proposed goals of WG2 for GP2 were:

* Identify the herpetofauna species occurring in agricultural landscapes in Europe.
* Gain information about pesticide application distribution and timing to estimate risk of spatio-temporal overlap with individual amphibians and reptiles.
* Finalise a proposal to relate amphibian and reptile field ecology to potential exposure to pesticide in the wild. This proposal will update and improve the deliverable #1 of the Action (proposal to relate pesticide use to spatial ecology and phenology of wild amphibians and reptiles). It was agreed to slightly widen the focus of this deliverable to increase its relevance. A modification of its due month (currently April 2020) will be requested given that the current situation in Europe relative to the Covid-19 outbreak makes difficult the coordination and/or organization of meetings to address this issue in the short term.

1. **Proposal of WG2 networking activities for Grant Period 2**

Working Group 2 proposed the following networking activities:

* A WG meeting together with WG1 (see agenda item 6) to establish all potential field scenarios for herpetofauna exposure to pesticides and to consider, list and prioritize exposure routes for the different groups and life stages. Dusko Blagojević (University of Belgrade, RS) volunteered to organize this WG meeting.
* A WG meeting to prepare the proposal to relate amphibian and reptile field ecology to potential exposure to pesticides in the wild (redefined deliverable #1 of the Action, see agenda item 8).
* Four STSM addressing the following scientific priorities:
  + Collect data on pesticide application regimes per crop type and region. Mattia Meli (Adama, FR) was proposed as host for this STSM.
  + Review data on spatial ecology and phenology of taxa susceptible of being exposed to pesticides in the wild. Marta Biaggini and Claudia Corti (University of Florence, IT) were proposed as host for this STSM.
  + Collect data on diet composition of herpetofauna and review methods for diet composition analysis. Marta Biaggini and Claudia Corti (University of Florence, IT) were proposed as host for this STSM.
  + Review further the use of ecological mesocosms in herpetofauna studies and their application to ERA of pesticides. Miguel Carretero (University of Porto, PT) was proposed as host for this STSM, which could be postponed to Grant Period 3 depending on the specific circumstances of the proposed host institution.

1. **Review of the state of the science relative to WG3 tasks**

Manuel Ortiz presented the preliminary structure, designed in collaboration with the leader of task 3.1, Valentin Mingo, to create a life history trait database, which should serve to identify focal species, parameterize species used in Agent-Based ecological modelling, and investigating specific traits accounting for increased sensitivity to pesticides. The preliminary structure was discussed and a final structure for the life history trait database was agreed (**Annex 3** – **Action deliverable #2**).

Christopher Topping, leader of task 3.2, presented the ALMaSS system of Agent-Based modelling to develop ecological models and their applications for using in ERA of amphibians and reptiles. An ALMaSS model for the Great Crested Newt was created in 2016 and is shown as example for other herpetofauna models that could be developed in the near future.

Manuel Ortiz showed the presentation prepared by the leader of task 3.3, Annette Aldrich, about coverage by surrogate taxa routinely assessed in ERA of the risks of pesticides to amphibians and reptiles.

Isabel Lopes, leader of task 3.4, reviewed the available in vitro methods that could be applied to determine the sensitivity of amphibians or reptiles to toxicants.

1. **Definition of WG3 objectives for Grant Period 2**

The proposed goals of WG3 for GP2 were:

* Collect information on life-history traits relevant to determine susceptibility to pesticide from herpetofauna species potentially exposed to pesticides in the wild.
* Explore the options of agent-based models to determine exposure risks in aquatic environments and to predict population-level effects from individual TK/TD models used at the individual level.
* Liaise with WG4 to check the relevance of all taxa routinely included in pesticide ERA to act as surrogates for amphibians or reptiles.
* Explore the usefulness of in silico approaches to estimate toxicological sensitivity of amphibians and reptiles.
* Investigate the chances of extrapolating in vivo toxicity from data obtained after in vitro testing.

1. **Proposal of WG3 networking activities for Grant Period 2**

Working Group 3 proposed the following networking activities:

* A WG meeting together with WG4 to review current ERA protocols for all taxa and find out additional options for inter-taxonomical surrogacy.
* Eight STSM addressing the following scientific priorities
  + One or two STSM to complete the life history trait database. Manuel Ortiz (IREC-University of Castilla-La Mancha, ES) was proposed as host for one of these STSM.
  + Connect TK/TD models to landscape modelling in ALMaSS. Christopher Topping (University of Aarhus, DK) was proposed as host for this STSM.
  + Training on ALMaSS. Christopher Topping (University of Aarhus, DK) was proposed as host for this STSM.
  + Adding pesticide fate to aquatic environments in ALMaSS. Christopher Topping (University of Aarhus, DK) was proposed as host for this STSM.
  + Provide the biological and ecological inputs of a well-known model species necessary to design a lizard model in ALMaSS. Manuel Ortiz (IREC-University of Castilla-La Mancha, ES) or Christopher Topping (University of Aarhus, DK) were proposed as hosts for this STSM.
  + Explore the potential use of web-ice (USEPA tool) to predict aquatic amphibian LC50 values after inter-species extrapolation.
  + Explore the use of QSAR to estimate mixture toxicity to amphibians.
  + Identify options to predict toxicity in vivo using in vitro testing. Isabel Lopes (University of Porto, PT) was proposed as host for this STSM.

1. **Review of the state of the science relative to WG4 tasks**

Silvia Pieper, leader of task 4.1, reviewed the general framework of pesticide ERA for amphibians and reptiles, summarized the main findings of the EFSA Scientific Opinion published in February 2018 and listed the major data gaps.

Emily McVey presented the main aspects that should be taken into account to develop a useful Guidance Document for pesticide ERA to amphibians and reptiles.

Marion Junghans presented the information about current pesticide monitoring programmes in aquatic environments in Switzerland, as an example for potential application in retrospective assessment of pesticide risks to herpetofauna.

1. **Definition of WG4 objectives for Grant Period 2**

The proposed goals of WG4 for GP2 were:

* Identify the major information gaps relative to the general ERA framework for amphibians and reptiles.
* Liaise with WG3 to check the relevance of all taxa routinely included in pesticide ERA to act as surrogates for amphibians or reptiles.
* Investigate the possibilities of integrating current biological and chemical monitoring programmes to integrate them for retrospective assessment of pesticide risks to herpetofauna.

1. **Proposal of WG4 networking activities for Grant Period 2**

Working Group 4 proposed the following networking activities:

* A WG meeting together with WG3 (see agenda item 12) to review current ERA protocols for all taxa and find out additional options for inter-taxonomical surrogacy.
* A WG meeting to review the general framework of pesticide ERA for herpetofauna, including definition of major gaps.
* Two STSM addressing the following scientific priorities:
  + Review further the current ERA protocols to explore options for surrogacy. The specific goals of this STSM should be determined in the joint WG meeting involving WG3 and WG4.
  + Review chemical and biological monitoring programmes across Europe and how to integrate them in ERA.

1. **Science Communication Strategies**

The Science Communication Manager, Cristina Borca, presented the main aspects to be considered when designing a strategy for communication and dissemination of PERIAMAR outputs.

Mathieu Denoël, president of the Societas Europaea Herpetologica, introduced the society to the action members and summarized the options for synergies between the society and PERIAMAR.

The science communication strategy was discussed and it was agreed to develop an internal protocol to be discussed at the Management Committee meeting.

1. **AOB**

There were no other business.

1. **Closing**

There was general agreement that the four meeting objectives (see agenda item 3) had been successfully achieved. The Chair acknowledged Local Organizers the successful organization of the meeting, as well as the work of all presenters and meeting participants.

## LIST OF ANNEXES

**Annex 1 – Attendance List**

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**Annex 2 – Agenda**

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**Annex 3 – Life-history Trait Database Model (Action deliverable #2)**

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