07/07/2022

# Subject │ Minutes of the Second Working Groups 1 and 3 Meeting and Third Working Group 4 Meeting of COST Action CA18221: “PEsticide RIsk AssessMent for Amphibians and Reptiles”

1. **Welcome to participants**

The participants (**Annex 1**) were welcomed by the Local Organiser, Jan-Dieter Ludwigs, on behalf of RIFCON. The Action Chair, Manuel Ortiz-Santaliestra, on behalf of all the WG Leaders, acknowledged RIFCON for the organization of the meeting.

1. **Adoption of agenda**

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

1. **Progress of the Action and the WG activities**

The Action Chair presented a summary of the different activities, including meetings, ended or ongoing STSMs and other actions taken to generate some outputs, in relation to each of the tasks corresponding to WGs 1, 3 and 4. The necessity of bringing together the progress arising from these activities and discussing them with the involved participants was highlighted. There was general agreement on the convenience of presenting the results of the STSM in the next General Meeting of the Action that will take place in autumn this year.

1. **Current and recent research projects relevant to the WG activities**

Several different research projects that are being conducted, have finalized recently, or are planned to take place in the near future, which are of interest to the objectives of the WGs, were presented.

Manuel Ortiz-Santaliestra presented the project TerAmphiTox, funded by UBA, whose objectives are to investigate the toxicity of pesticides on amphibian terrestrial stages, to establish patterns of toxicity based on the properties of the substances, to determine the role that effects on skin play on the toxicity, and to establish criteria for identifying pesticides whose toxicity to amphibians can be extrapolated from surrogate taxa.

Manuel Ortiz-Santaliestra and Andreas Focks presented the project AMPHIDEB, funded by EFSA. The project has three objectives, two of which are related directly to the objectives of the WGs: (i) structured data collection for amphibian and reptiles and development of open source biologically-based models for European amphibians and reptiles, and (ii) calibration and validation of the biologically-based models for the risk assessment of single chemicals, multiple chemicals, chytrid fungi and multiple stressors in amphibians and reptiles. The presenters highlighted the fact that the consortium that is implementing this project is a result of the networking environment facilitated by PERIAMAR.

Peter Vermeiren presented the project ‘Life cycle energetics of reptiles under pollution stress’. The project aimed at developing a mechanistic model to simulate population-level risk for reptile populations under multiple stressors, which was approached through the Alligator Pollution bioAccumulation model. Possible extensions of this projects, in particular the incorporation of maternal transfer of pollutants to the eggs and offspring, are being investigated as part of an ongoing STSM.

Frances Orton, attending online, presented her research on ‘Investigating the impacts of aquatic contaminants on amphibians in a multi-stressor context’. This includes a current project evaluating the impact of microplastics on aquatic environments and a proposal for a project integrating chemicals and other stressors. The intention is also to use effect modelling, hence an opportunity to interact with AMPHIDEB, and with modellers also involved in PERIAMAR was identified.

Annette Aldrich presented PERA a finalised EFSA project for the building a European partnership for next generation, systems-based environmental risk assessment. Annette Aldrich also presented the new EU-funded Partnership for the Assessment of Risks of Chemicals (PARC). PARC is a very large project, and the focus was placed on one of its tasks (6.4.4) on Risk assessment to support and promote efficient overall protection of biodiversity, whose development came up in part from the conclusions of PERA.

Benedikt Schmidt presented the project ‘ PPP exposure of terrestrial stages of amphibians and possible management measures’, conducted in collaboration with Swiss agencies (BAFU and Agroscope). The project includes a survey among collaborators about how PPP exposure of amphibians in the terrestrial environment could be reduced, a population model to extrapolate PPP-induced mortality to population-level effects, a landscape-scale analysis to identify areas of overlap between pesticide use and amphibian presence with the purpose of designing landscape-based risk management options, and a small-scale field study on the habitat use of amphibians in relation to agricultural fields.

Gianpaolo Montinaro and Jan-Dieter Ludwigs presented the studies conducted by RIFCON to investigate the daily activity pattern of sand lizards in vineyards, using telemetry approaches. The study analysed the spatial behaviour of lizards and their activity while present in vineyards where pesticides are applied. This type of approaches is of high interest for the refinement of the exposure as part of the high-tier risk assessment.

1. **Overview ERA for amphibians and reptiles: status, current projects, and needs**

The leaders of WG 1, Andreas Focks, and WG3, Annette Aldrich, presented the mind map that was elaborated during the last WG4 meeting (**Annex 3**). The purpose now is to determine actions or activities possibly useful to address each branch in the mind map. It is agreed that this could take the form of a review paper whose presumptive title could be “Information collection about development of ERA of PPP for amphibians and reptiles”. The paper could have the following outline:

1. Schematic differentiation and breakdown into details. Present the general overview and the tree branches.
2. Provide an overview about completed and ongoing activities (arising from the inputs provided by PERIAMAR participants).
3. Identify branches / parts in the mind map that are not addressed by activities, and list them as gaps.

There was some discussion about the possibilities and/or convenience to publish such a paper. First, because there is no novelty and second because it could be quickly outdated as the ERA progresses. It is agreed that publication is relevant as long as the paper is built in a way that it contributes to link current activity with filling gaps. The proposal is then to write it as a roadmap for next generation risk assessment for amphibians and reptiles. We can use what we know about ongoing projects and how they contribute to this roadmap.

The first step will be creating a living document with the mind map and links to the projects that can contribute to each branch, to publish it in PERIAMAR website. The following procedure is agreed:

1. Revise the mind map to make it enough self-explanatory (e.g. explaining all the abbreviations).
2. We will create a shared document with a clear description of the information that we want, possibly with examples. The information must include: project title, contact person, partners (including countries), period, objective, description on how it contributes to any of the map branches, website (if any), published outputs (if any). This should be finished in August.
3. Share the document above with PERIAMAR participants, for them to fill in it with the requested information during September.
4. Present the document in the General Meeting.

In addition, the list of questions (**Annex 4**) of WG4 to other WGs was reviewed. Although the group did not go to all questions, there were some proposals about how to answer them:

Question: *What level of “simple” model (e.g., exposure, population-level effects, etc…), includes enough detail to account for an acceptable level of uncertainty and when are simple models insufficient?*

The first we need to know is which questions we want to answer in RA, and which of those questions can be answered using models. This will depend very much on what kind of risk assessment we propose (e.g. a conventional approach using a tiered system, a system-, landscape-, or population-based assessment). Modelling is in general not accepted by regulatory authorities. Assuming that current RA for amphibians and reptiles is almost inexistent, the group can propose what we think is better. Anyway, this is something that needs to be discussed with EFSA, for which a dedicated meeting with them is proposed. Once this is clarified with EFSA, a workshop on the incorporation of modelling into ERA for amphibians and reptiles could be organized.

Question: *How much spatial and temporal detail is necessary for amphibian and reptile risk assessment given the multiple potential threats (e.g., local habitat quality, disease) and the potential role of environmental stochasticity (e.g., variable annual reproductive success)?*

This is something to be incorporated to the previous question on what we want to answer with the models, as the most feasible way of assessing population-level effects is the use of population models.

Question: *How can it be ensured that refinement options will be accepted by regulators in cases where the Tier 1 identifies a risk?*

As long as they are in a guidance elaborated by EFSA, there should be no problem for them to be accepted. In this context, it is reminded that WG2 is working on a paper with potential refinement options.

Question: *How to ensure that wild amphibians and reptiles not only survive but that there are insignificant risks for harmful effects on e.g. their reproduction?*

A protective chronic effect assessment should be guaranteed. Where such an assessment cannot go, an effective post-approval monitoring should be implemented.

Question: *How can the SPG be aligned between different regulations and strategies (BHD, Green Deal, Biodiversity 2030, Zero Pollution Ambition etc etc)*

The Essential Biodiversity Variables (<https://geobon.org/ebvs/what-are-ebvs/>) can provide an interesting an option to link all these strategies.

Question: *Assuming that risk management measures work better when applied in an integrated context (i.e. considering all ecosystem elements), what is the strategy to follow to propose management measures regarding amphibians and reptiles?*

To check whether the risk management measures (RMM) work, it is necessary to define the protection goal (e.g. population persistence, minimum population size, growth rate…). In this context, it is important to make a clear definition of the population. This applies also to monitoring.

A future STSM is suggested to review and list options for landscape-based RMM with potential applicability to amphibians and reptiles.

Question: *How can risks be assessed within a context of other stressors (habitat deterioration, diseases, other chemicals…) acting on individuals and populations?*

An option is to incorporate additional stressors to effect models as it is being done e.g. in AMHIDEB. Another option is to consider other stressors as part of the monitoring, by looking at the overall effects of the landscape (including pesticides) on populations. The problem comes up when we need to determine the role of pesticides on eventual population declines in a multiple stressor context. With this purpose, we should design a protocol to determine whether it is plausible that pesticides are having an effect, which could be supported by individual-based toxicity data.

Questions on monitoring.

The question with monitoring is whether to include it as a part of risk assessment without the need of authorities asking for post-registration assessment. If the prospective assessment turned into a scheme more based on predictive models and less on lab-generated data (see comment to the first question above), the need for monitoring would probably become higher.

A meeting is proposed to discuss how monitoring could be implemented as part of RA. One of the questions to be discussed would be how to determine for which products the monitoring is needed and/or mandatory.

Question: *Given that existing standardized tests with amphibians consider mainly water exposure route, is it necessary to develop new experimental methods to cover adverse effects resulting from other exposure routes in water? (e.g. oral)?*

*Would these endpoints cover (ecotoxicology or regulatory) also dermal and oral uptake in terrestrial environment? And if no, do we need new tests?*

It is important to try to address the integration of exposure routes through modelling in order to avoid the need of implementing a new test method for dermal toxicity testing in amphibians.

Question: *Would it be feasible to select one in silico model species (or a few model species; aquatic, semi-aquatic and terrestrial) sensitive enough to extrapolate to all species in the environment by considering aquatic and terrestrial life-stages?*

The incorporation of in silico tools could be addressed by predicting effects from currently available tools (QSAR, etc.) and do validation in vivo experiments for a certain number of substances.

1. **Closing**

RIFCON offered a visit to vineyards where they conducted their sand lizard project to close the meeting.

## LIST OF ANNEXES

**Annex 1 – Attendance List**

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**Annex 2 – Agenda**

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**Annex 3 – Mind map**

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**Annex 4 – List of questions**

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