

Plenary 3 : Thursday 24 November, 8:45 - 9 :30

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A toxic cocktail? The response of ecosystems to chemicals

In the Anthropocene, most if not all ecosystems are influenced by multiple stressors including several thousands of toxic chemicals. The quantification of this chemical multiverse remains challenging, which may explain why many studies have focussed on a few “hype” chemicals or simply ignored the issue of chemicals in ecosystems. Interactions between chemicals and between chemicals and non-chemical stressors further complicate prediction of the response of populations, communities and food webs in ecosystems to the cocktail of chemicals. This in turn hampers the evaluation of the role of chemicals as global change drivers and thereby environmental management and conservation. I provide an overview on our current knowledge on the distribution, risks and effects of chemicals and their mixtures in ecosystems. Methods and their pitfalls when aiming to consider the potential effects of chemicals in ecosystems will be discussed. I argue that chemicals represent a systemic problem that can not be captured through a single substance lense and outline how a stronger integration of ecology and ecotoxicology would improve our understanding and capacity for prediction. In this context, I also reflect on how recent advances building on breakthroughs in biomolecular and computational approaches may be useful for ecological studies on non-chemical stressors. The talk ends with a discussion of management solutions to reduce chemical pollution at different scales.