

## **Fate, risk assessment and management of natural toxins: state-of-the-art, challenges and future perspectives**

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Natural toxins are compounds produced by organisms, other than human beings, with toxic effects on human and other organisms. Both plants, fungi, bacteria and microalgae produce natural toxins covering a huge chemical diversity, modes of action and often with continuous production in large quantities in proximity or within vulnerable resources such as food, feed and drinking water. Risk assessment and management of a number of natural toxins has led to a set of regulations and legislation accepted and implemented at world level, which are revised regularly based on the existing data, technical advances, and new evidences and challenges. However, for many natural toxins there are no analytical methods, no monitoring data and no regulation despite that toxicity has been documented. Despite the differences between compounds and sources, the risk assessment strategy is quite similar to the one for xenobiotics: it is based mainly on the prevention of the exposure to the toxic compound by regular monitoring of the toxin presence in food, feed and water (typical intoxication vias) as well as the presence of the producing organism in the environment. The diversity of sources, temporal and spatial variation in release from the sources, and diversity of compounds demands for analytical methods and research fields involved in their monitoring and fate. The main technical challenges are related to the improvement of the methods in order to get faster, cheaper and more reliable results, leading to portable, screening, on-line, real-time or remote sensing data; and including lower limits of detection and quantification. Natural toxins are a worldwide challenge due to the numerous and high-production sources, the increase of travel and toxin transfer due to tourism, and the trade (of food etc) between separated geographical regions. Limited knowledge has been gathered about the effects of climate change, spreading of invasive species (producing natural toxins) and emission of new and more aggressive natural toxin organisms - in particular microorganisms. The aim of the session is to update and compare the methods used to analyse, monitor and study different natural toxins, sources and fate in order to learn from this experience, discuss common challenges and establish future goals and perspectives related to research, management and social impact of natural toxins.