

**Title**

Microbial ecotoxicology: an emerging scientific field facing contemporary environmental threats

**Abstract**

Microbial ecotoxicology is a scientific field which aims at studying both (i) the ecological effects of toxicants on exposed microbial communities and their consequences on the various functions that they ensure in the ecosystems and (ii) the role of microbial communities in the ecodynamic of those pollutants (dissipation, transformation, accumulation, transfer...). Microbial ecotoxicology seeks not only to conduct fundamental researches to understand the impact of pollutants on microbial processes (and vice versa) but also to carry out applied researches to provide tools to monitor the evolution of the ecological quality of the environment.

This will be illustrated in the presentation through several examples of field and microcosm experiments which aimed to better establish the causal links between toxicant exposure and the structural and functional responses of benthic microbial communities under multiple environmental pressures. Among others, the presented results will show that the functional assessment of microbial communities, with a specific focus on their capacity to adapt to chronic exposure to toxicants, could give more ecological relevance to the tools that are now available for assessing the ecological status of aquatic ecosystems.

**Keywords**

Microbial communities, Ecological functions, Bioindicators, Environmental risk assessment, Ecotoxicological effects

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**Bio**

Stéphane Pesce is the leader of the research group “Microbial ecology in anthropized hydrosystems” at the French National Research Institute of Science and Technology for Environment and Agriculture (Irstea). For more than a decade, he has been studying the structural and functional responses of aquatic benthic microbial communities to toxicant exposures. Investigations are performed on periphytic biofilm, sediment and leaf litter microbial communities, and a special attention is given to the study of microbial adaptation processes following chronic exposure to toxicants (pollution-induced community tolerance, stimulation of biodegradation capacities...) to develop, among others, innovative approaches for water quality bioindication. He is the co-creator of the Emerging Network of Microbial Ecotoxicology (EcotoxicoMic) and is a member of the Directory Board of the Rovaltain Scientific Foundation for research in Health and Environment.

More details on <http://www.irstea.fr/en/pesce>



### **Detailed contact information**

Dr. Stéphane PESCE

Irstea Lyon-Villeurbanne

Research Unit "Freshwater Systems, Ecology and Pollution"

5 rue de la Doua, BP 32108

69616 Villeurbanne Cedex, France

+33472208795

[stephane.pesce@irstea.fr](mailto:stephane.pesce@irstea.fr)