Call for papers

Special issue: Harnessing Chemical Ecology for Improved Pest management.

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Substantial increases in agricultural productivity are required to provide sufficient food for growing global populations. Crop pests (insects, pathogens, and weeds) cause major constraints to crop production, reducing food crop yields and quality. To address these losses, the application of chemical inputs for pest management, including broad-spectrum chemical pesticides, has been adopted, which has been instrumental in reducing losses caused by pests. However, these inputs can pose several negative impacts on the environment and human health, as well as increasing pesticide resistance, rendering them less effective. Therefore, to provide for a growing population, it is necessary to develop alternative, more environmentally sound control strategies for pest management.

Chemical ecology is the study of chemically-mediated interactions between organisms across trophic levels, through the production of chemical signals and toxins. These chemical signals are produced by organisms including plants, insects, and microorganisms, enabling them to communicate intra- and inter-specifically. These signals can be exploited for pest management of crops through several mechanisms, including, but not limited to, induced plant defences against pests, direct suppression of pests, and signalling to beneficial predators/parasitoids for pest control. The use of chemical signals could therefore offer more sustainable methods for pest control compared to current methods, including the application of chemical inputs to agricultural systems. Identifying the chemical signals involved in these biological activities, and advancing our understanding of their biological roles, could enable the development of novel, sustainable tools to increase crop productivity.

This special issue welcomes original research and review papers relating to all aspects of how chemical ecology can be used to address crop security challenges, including the following suggested topics:

- Chemically mediated interactions between plants, insects, and microbes (above- and below-ground), in both agricultural and forest ecosystems.
- Biological control of crop pests, including biopesticides, especially natural products obtained from natural sources, for integrated pest control strategies.
- Proof of concept studies demonstrating the efficacy of semiochemical-based strategies for pest management.
- Isolation and synthesis of semiochemicals, biological activity tests, and determining modes of action.
- Review papers, providing a synthesis of up-to-date literature relating to food security in the context of chemical ecology.
- Natural toxins involved in interactions between crops and pests and between pests and other organisms.

Deadline for submission: September 30th, 2024.

Keywords

- Semiochemicals
- Volatile organic compounds
- Chemical Ecology
- Natural Products
- Biopesticides
- Olfactory cues
- Integrated pest management
- Chemical communication
- Allelopathy
- Pest biology
- Agroforestry
- Natural toxins

Submission: Please be sure to select the ‘Harnessing Chemical Ecology for Improved Pest management’ option when asked if your paper is for a Special Issue