



Presentation information

Symposium

20.Others

[20-3] Biotremology II - Applied Biotremology

Mon. Aug 26, 2024 4:15 PM - 6:15 PM Room K

Chair: Valerio Mazzoni (Fondazione Edmund Mach), Takuma Takanashi (Forestry and Forest Products Research Institute), Johannes Strauss (Justus Liebig University, Giessen)

4:15 PM - 4:30 PM

[20-3-01] A new Lexicon for Biotremology to bridge the gap with Chemical Ecology

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Numerous studies of applied biotremology are currently conducted worldwide, addressing various subjects with diverse approaches. In some cases, this research has yielded practical solutions already available on the market, such as bimodal traps for stinkbugs and devices for the vibrational mating disruption of grapevine leafhoppers. The increasing interest in applied aspects of biotremology has underscored the necessity of a shared terminology. This is crucial to promote intra and interdisciplinary communication, preventing unnecessary redundancy and ensuring immediate comprehension, even among non-specialized audiences. In recent years, three milestones have shaped applied biotremology. First, in 2022, the term "semiochemicals" was introduced to indicate physical (including mechanical) signals affecting animal behavior, in parallel with semiochemicals. In 2023, the concept of "ecology of fear" was extended to biotremology including vibrational signals into crop protection strategies. In this case, disturbance vibrations, even if not directly affecting key behaviors (e.g., mating, oviposition) can cause stress to insect pests, significantly reducing their fitness and plant damage. In 2024, the lexicon was furtherly expanded with the introduction of iconic terms like "pherodones" and "allelodones", aligning with chemical ecology. The suffix "done" originates from the ancient Greek "δῶνιο", meaning to shake. Pherodones are, therefore, homologous to pheromones, encompassing vibrational signals specifically emitted for intraspecific communication. Insects exhibit various types of pherodones, including sexual, aggregation, social, alarm, and parental pherodones. Allelodones are categorized in "kairodones", "allodones" and "synodones" analogous to their semiochemical counterparts, based on their consequences as benefits or

detriments for emitters and receivers. The path is now traced and the vision for the future involves further consolidating the concept of applied biotremology for broader understanding among the difference audience of stakeholders engaged in plant protection. The integration of vibrational signals into the framework of pest management strategies holds promise for more sustainable and effective approaches, marking an exciting frontier in the ongoing efforts to safeguard agricultural ecosystems.