Session

6. Environmental policy, risk management, and risk communication

Development and validation of standardised methods and their use in regulatory frameworks (Adam Lillicrap, Sebastian Buchinger, Kirit Wadhia)

Poster Presentation

Title: A novel, efficient, and ecologically relevant bioassay method using multiple aquatic fungal species for fungicide ecological effect assessment.

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Abstract

Fungicide is used to prevent fungal plant pathogen, and it may have high toxicity to aquatic fungi, which play an important role in natural aquatic ecosystems. However, bioassay method using aquatic fungi have not been well developed. In the present study, we developed a novel, efficient, and ecologically relevant bioassay method for fungicide ecological effect assessment. Candidate test species were selected by considering the following 4 factors: (1) widely distributed and frequently observed species in natural aquatic ecosystems; (2) including a wide range of taxonomic groups; (3) available from public culture collections; (4) suitable for microplate test method. Finally, we selected the following 5 fungal species: *Rhizophydium brooksiaum* (Chitridiomycota) strain NBRC 103829, *Chytriomyces hyalinus* (Chitridiomycota) strain NBRC 102555, *Tetracladium setigerum* (Ascomycota) strain NBRC 102389, *Sporobolomyces roseus* (Basidiomycota) strain NBRC 10566, and *Aphanomyces stellatus* (Oomycota, fungus-like microorganisms) strain NBRC 103817. An efficient test method using above fungal species was developed based on algal microplate assay, which is adopted in standard method of ISO 8692 (Water quality — Freshwater algal growth inhibition test with unicellular green algae). Test vessel was 96-well white microplate and test duration was 48 h. Fungal biomass was determined by ATP based luminescence method, which is adopted in standard method of ISO 13629-1 (Textiles — Determination of antifungal activity of textile products — Part 1: Luminescence method). The ATP luminescence is known to be proportional to live cell density and can be determined using microplate reader. Test performance was evaluated by conducting bioassays of 3,5-dichlorophenol and malachite green as standard test substances.