Extended Abstract

The Effect of Fluorescent Strigolactone Mimics on the Development of Phytopathogenic Fungi [†]

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Strigolactones (SLs) are organic molecules synthesized by plants that have two main functions, acting as plant hormones and regulating numerous aspects regarding plant development and various stress-related functions, as well as signaling molecules in the rhizosphere [1]. Due to their biological activities, they could be used as plant biostimulants, but the natural SLs have a complex structure that is difficult to synthesize. Therefore, SL analogues and later SL mimics that preserve the activity of natural SLs have been synthesized [2]. In this study, we tested the bioactivity of new SL fluorescent mimics on two strains of phytopathogenic fungi. The fungal strains were *Fusarium graminearum* and *Rhizoctonia solani*, which were grown on Potato Dextrose Agar (PDA) medium at 28 °C, for 5 days. A piece of agar was taken and placed in the center of Petri dishes of either water agar or Poloxamer 407 medium containing different solutions of fluorescent SL mimics (SL-20 and SL-21) incorporated in different culture media which include agar and Poloxamer 407. To examine the number of hyphal branches and their morphological characteristics in poloxamer and agar cultures, we used a stereomicroscope (OPTIKA, Italy). The diameter of the fungal colonies was measured after 3 days. The radial growth of the two tested fungi was significantly inhibited by the classical SL analogue GR24, and by the new SL mimics SL-20 and SL-21 at a concentration of 10⁻⁵ both in agar and poloxamer. The new SL mimics, especially SL-21, were as efficient as GR24. The highest effect was obtained against *R. solani*. At lower concentrations, the effect was much less pronounced. No significant effect was observed on hyphal branching for neither SL concentration, but GR24 and SL-21, and to a lesser extent SL-20, increased the pigmentation of *F. graminearum* in the medium with poloxamer. We propose new SL fluorescent mimics that have the same effect as GR24, inducing a stress response and inhibiting phytopathogen growth. The synthesised SL mimics can be used for further in depth investigation of SL–plants and SL–microorganisms interactions based on fluorescence analysis.

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