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Poster 144: P44 Fungal endophyte exo-metabolites alter the morphology and metabolome of the plant pathogen *Fusarium graminearum*: an LC-MS based metabolomics approach to unravel the biocontrol effect

Mohamed F. ABDALLAH^{1,2}; Gerard Bryan GONZALES³; Maarten AMEYE²; Geert HAESAERT²; Kris AUDENAERT^{2§}; Sarah DE SAEGER^{1§}

¹Centre of Excellence in Mycotoxicology and Public Health, Ghent University, Belgium

²Laboratory of Applied Mycology and Phenomics, Faculty Bioscience Engineering, Ghent University, Belgium

³Group of Gastroenterology, Faculty of Medicine and Health Sciences, Ghent University, Belgium and VIB Inflammation Research Centre, Ghent, Belgium

§ equally contributed

Introduction

Fusarium graminearum (FG) is a predominant fungal pathogen of cereals, which also produces secondary metabolites, i.e. mycotoxins, that harm human and animal health [1]. We previously showed the potential of two endophytic fungi: *Epicoccum nigrum* (EG) and *Sordaria fimicola* (SF) to inhibit growth and mycotoxin production of FG [2]. In this study, we used metabolomics to elucidate the potential mechanisms involved in their biological control.

Technological and methodological innovation

We optimized an in vitro assay using tissue plate inserts to assess the biological effects of EG and SF exo-metabolites on FG. Changes in growth characteristics of FG exposed to the exo-metabolites were monitored using automated high-resolution multispectral imaging. We further investigated the metabolome profile changes of FG after exposure to the exo-metabolites using untargeted metabolomics on both reversed-phase and HILIC to elucidate potential mechanisms of action.

Results and impact

We showed that EG and SF exo-metabolites altered the morphological and growth characteristics, as well as the overall metabolome of FG. Using multivariate analyses, we selected metabolic features that could potentially elucidate the biochemical changes undergone by FG in response to the presence of exo-metabolites. This study shows that apart from competition of live fungi, EG and SF exo-metabolites themselves exert metabolic action against FG which could explain their biocontrol activity.

References

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