IAPPS

INTERNATIONAL ASSOCIATION FOR THE PLANT PROTECTION SCIENCES

HELLENIC SOCIETY OF PHYTIATRY

AGRICULTURAL UNIVERSITY OF ATHENS

XX International Plant Protection Congress

Healthy Plants Support Human Welfare

1-5 JULY 2024

MEGARON ATHENS INTERNATIONAL CONVENTION CENTER

ATHENS GREECE

Abstract Book

Posters

P055

EVALUATING THE EFFICACY OF POTENTIAL BIOCONTROL AGENTS FROM DISEASE-SUPPRESSIVE SOIL IN REDUCING GANODERMA BASAL STEM ROT INCIDENCE

Goh Y.[1,2], Goh Y.[2], Ayub Q.[1,3], Ting A.[1]

1. School of Science, Monash University Malaysia, 47500 Bandar Sunway, Malaysia, 2. Advanced Agriecological Research Sdn Bhd, 47810 Petaling Jaya, Malaysia, 3. Monash University Malaysia Genomics Facility, 47500 Bandar Sunway, Malaysia

Ganoderma basal stem rot (BSR), caused by *Ganoderma boninense*, is the most lethal fungal disease affecting oil palms. Oil palms planted in disease-suppressive Blenheim soil (DS-BhS) (Typic Quartzipsamment) exhibited lower BSR incidence compared to those planted in disease-conducive Bernam soil (DC-BeS) (Typic Endoaquept). The soil microbiota has been observed to play a crucial role in disease suppression in DS-BhS. Hence, DS-BhS was selected as the medium for isolating biocontrol agents (BCAs). Amongst 21 microbial isolates (fungi, bacteria, and actinomycetes) isolated from DS-BhS, three microbes were shortlisted as potential biocontrol agents towards *G. boninense* based on a slide culture assay. Of these, *Trichoderma yunnanense* D6, *T. simmonsii* D19, and *Streptomyces abikoensis* M24 (isolated from DS-BhS) were discovered to have strong biocontrol activities against *Ganoderma boninense*. *Trichoderma yunnanese* and *S. abikoensis* induced cytoplasmic vacuolation and shrinkage, deformation of the mycelia, and lysis of mycelia of *G. boninense*. Additionally, *T. simmonsii* formed haustorial-like pegs, penetrating and establishing inter-cellular growth within mycelia of *G. boninense*. When applied as a consortium in nursery trials, a reduction of 4 to 55 % in BSR disease severity was observed. Furthermore, none of the three isolates were pathogenic to oil palm or induced growth setbacks. These findings revealed that the consortium of two *Trichoderma* and one *Streptomyces* derived from DS-BhS can be applied for managing BSR disease sustainably.

P056

BIOACTIVE COMPOUND FROM EPICOCCUM NIGRUM STRAIN BPF3, AN ENDOPHYTE ISOLATED FROM THE FLOWERS OF BETHENCOURTIA PALMENSIS

González V.[1], Díaz C.[4], Andrés-Yebes M.[2], González-Coloma A.[2], Rojas J.[2,3]

1. Centro de Investigación y Tecnología Agroalimentaria de Aragón (CITA), Zaragoza, Spain, 2. Instituto de Ciencias Agrarias, CSIC, Madrid, Spain, 3. Departamento de Biotecnología Biología Vegetal, Escuela Técnica Superior de Ingeniería Agronómica, Alimentaria y de Biosistemas (ETSIAAB), Universidad Politécnica de Madrid, Madrid, Spain, 4. Instituto de Productos Naturales y Agrobiología, CSIC, La Laguna, Tenerife, Spain

Islands are recognized as hubs for numerous endemic plants, uniquely confined to specific regions, serving as natural reservoirs for undiscovered microorganisms with potential medical and agricultural uses. Endophytic fungal microbiome from *Bethencourtia palmensis* has been shown in the past as a source of strains with potential use in the production of biopesticides.

A new fungal strain (isolate BPF3) characterized as belonging to *Epicoccum nigrum* (Pleosporales, Ascomycota), a well-known cosmopolite endophyte sourced from the flowers of *Bethencourtia palmensis* gave an organic extract with potent antifeedant activity against insect pests including *Myzus persicae, Rhopalosiphum padi, Spodoptera littoralis*, and certain fungal phytopathogens such as *Botrytis cinerea*. A bioactive compound responsible of most of the activity of the extract has been purified and identified as **(E)-2-hydroxy-2,4-dimethyl-5-(prop-1-en-1-yl)furan-3(2H)-one**.

This work will present the optimization of the production of this bioactive compound by the strain BPF3 (time-course fermentation and medium modification) and the study of the antifungal activity of its optimized extract against *B. cinerea, Fusarium oxysporum* and *Alternaria alternata*.

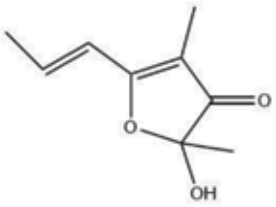

Fig. 1. (E)-2-hydroxy-2,4-dimethyl-5-(prop-1-en-1-yl)furan-3(2H)-one.

Acknowledgements: This study has been financed by the project PID2019-106222RB-C31 MCIN/AEI/10.13039/501100011033 and FSE "El FSE invierte en tu futuro"

P057

BIOCONTROL POTENTIAL OF TRICHODERMA SPECIES AGAINST FOMITOPSIS MELIAE CAUSING CITRUS BROWN WOOD ROT DISEASE IN THE SOUTHWESTERN UNITED STATES

Hu J.[1]

1. University Of Arizona, Tucson, United States

Citrus brown wood rot, caused by Fomitopsis meliae, is a major cause of tree mortality in lemon orchards in the southwestern United States. F. meliae sporulates on abandoned wood debris on the orchard floor and spreads through windborne basidiospores and infects tree branches and the main stem through wounds. There are no products registered in the USA for the management of this disease. The objective of this study was to assess the biocontrol potential of Trichoderma species recovered from rhizosphere soil samples in Yuma lemon orchards against F. meliae. A total of 48 isolates of Trichoderma were evaluated under laboratory conditions against F. meliae using dual culture assay. The results indicated that 24 isolates could inhibit the mycelial growth of F. meliae significantly. Among them, four isolates (i.e. 1T1, 1T24, 1T40, 1T42) showed the highest antagonistic activity with 81.5 - 87.9 % inhibition. Cell-free metabolite extract and volatile metabolites of these 4 effective isolates also inhibited the growth of F. meliae in the culture medium. Under greenhouse conditions, these 4 isolates were effective in protecting wounds of tree branches from infection by F.