

T04-P10

SPATIAL AND TEMPORAL VARIATION OF ENDOPHYTIC COMMUNITIES ASSOCIATED TO THE PHYLLOSPHERE OF OLIVE CULTIVARS

PATRICK MATERATSKI, CARLA VARANDA, TERESA CARVALHO, ANTÓNIO DIAS, MARIA DOROTEIA CAMPOS, FERNANDO REI, MARIA DO ROSÁRIO FÉLIX

UNIVERSIDADE DE ÉVORA ICAAM

Fungal endophytes are micro-organisms that colonize healthy plant tissues without causing disease symptoms. They are described as plant growth and disease resistance promoters and have shown antimicrobial activity through the production of antagonistic bioactive substances. Studies combining spatial and temporal distribution of endophytic communities in terms of abundance and diversity in the phyllosphere of olive cultivars have been poorly explored. Thus, this study aims to investigate the abundance and diversity of endophytic communities at three sampling seasons and sites, in the Alentejo region south of Portugal. Additionally and because the impact of some pathogenic fungi (e.g. *Colletotrichum* spp.) vary according to olive cultivars; Galega vulgar, Cobrançosa and Azeitira, with different degree of susceptibility, were sampled. The 1868 fungal isolates obtained belong to 48 OTUs representing 31 fungal genera. Autumn season and cultivar Galega vulgar showed the significant highest values in terms of endophytic abundances and diversities, the mainly dominant factors that shaped the communities. At the site level a low variability was found in terms of diversity and abundance of the endophytic communities. This study reinforces the importance of exploring the combined spatio-temporal distribution of the endophytic biodiversity in different olive cultivars, highlighting the limited information on isolation and characterization of endophytes from important cultivars and the need for more detailed analyses in this field. Knowledge about endophytic communities may help to better understand their functions in plants hosts, such as the ecological dynamics between pathogenic fungi and beneficial colonizers, which could be explored as biocontrol agents in the future.

Acknowledgments

This work was supported by the project 'Integrated protection of the Alentejo olive grove. Contributions to its innovation and improvement against its key enemies' with the reference ALT20-03-0145-FEDER-000029, co-financed by the European Union through the European Regional Development Fund, under the ALENTEJO 2020 (Regional Operational Program of the Alentejo). This work is also funded by National Funds through FCT – Foundation for Science and Technology under the Project UID/AGR/00115/2013.

T04-P11

DIFFERENCES IN VIRULENCE AND SENSITIVITY TO FUNGICIDES WITHIN COLLETOTRICHUM ISOLATES CAUSING OLIVE ANTHRACNOSE

ANA LÓPEZ MORAL, CARLOS XAVIER, AZAHARA ESCALONA, ANDRÉS VENANCIO VIOQUE WAYNEZ, CARLOS AGUSTI BRISACH, JUAN MORAL MORAL, ANTONIO TRAPERO CASAS

UNIVERSIDAD DE CÓRDOBA AGRONOMÍA

Anthraco-nose is among the most important foliar and fruit diseases affecting Mediterranean woody crops, including olive and almond. This disease is caused by a wide diversity of fungal species belonging to the *Colletotrichum acutatum* and *C. gloeosporioides* complexes. Pathogenic specialization and sensitivity to fungicides of *Colletotrichum* isolates have traditionally been used for the intra- and inter-specific identification within this genus. Previous studies demonstrate that *Colletotrichum* spp. causing olive and almond anthracnose showed significant differences in virulence between species, independently of their host of origin. The objectives of this work were to elucidate the effect of the diversity of *Colletotrichum* spp. on the infection of olive and almond fruit and on the sensitivity to fungicides. To achieve the first objective, olive and almond fruit from several commercial cultivars were inoculated with different isolates of *C. acutatum*, *C. gloeosporioides*, *C. godetiae* and *C. nymphaeae*. Significant differences in virulence between isolates were detected, although host specialization was not observed, with the exception for *C. acutatum* isolates from almond which showed more virulence on almond than on olive. The sensitivity to copper compounds, protectant and systemic fungicides was evaluated by *in vitro* sensitivity tests and by bioassays on apple fruit. Tebuconazole was the most effective fungicide against all the isolates tested. Differences in sensitivity to several fungicides were observed between *Colletotrichum* spp., as well as between isolates within the same fungal species depending on the host of origin. These results are relevant for the control of the disease.

T04-P12

EVALUATION OF THE SILVOLIVE WILD OLIVE COLLECTION FOR RESISTANCE TO VERTICILLIUM DAHLIAE

PABLO DIAZ RUEDA¹, NIEVES CAPOTE², ANA AGUADO², LAURA ROMERO CUADRADO², CARLOS CARRASCOSA², JOSE MANUEL COLMIENERO FLORES¹

¹INSTITUTO DE RECURSOS NATURALES Y AGROBIOLOGÍA DE SEVILLA (IRNAS), CSIC PLANT BIOTECHNOLOGY; ²FAPA "LAS TORRES", JUNTA DE ANDALUCÍA SUSTAINABLE CROP PROTECTION

In recent years, the olive cultivation model has undergone a change from the traditional cropping model under rain-fed regime to intensive and super-intensive olive groves subjected to fertilization and irrigation. This has enhanced the proliferation of soilborne fungi like *Verticillium dahliae* causing verticillium wilt, currently the most threatening disease for olive crops in Spain due to the rapidity of its extension and the severity of its damage. Moreover, the most widely planted olive cultivars (Picual, Hojiblanca and Arbequina) are susceptible or very susceptible to the disease, especially under intensive conditions. We aim to take advantage of the genetic variability present in the wild subspecies of *Olea europaea* to identify and characterize wild olive genotypes with a high resistance to the verticillium wilt disease.

The SILVOLIVE collection consists of 149 genotypes from all known subspecies of *Olea europaea* described so far, including the subspecies: *europaea*, *laperrinei*, *cuspidata*, *cerasiformis*, *guanchica* and *maroccana*. These genotypes were prospected from world olive germplasm collections (Córdoba and Marrakech) and different regions of Spain, continental Africa and the Macaronesian archipelago. Susceptibility to *V. dahliae* of 56 wild olive genotypes has been evaluated under controlled conditions inoculating six-month-old olive plants with a cotton defoliating isolate of *V. dahliae* (V117). After root inoculation of the fungus (107 conidia ml⁻¹), quantification by qPCR at 35 and 120 days after inoculation, and analysis of symptoms in aerial organs, three genotypes showed high resistance/tolerance indexes. These genotypes can be used as high tolerance rootstocks as a control strategy for the growth of commercial and productive olive cultivars.

T04-P13

FUNGAL VASCULAR DISEASES ASSOCIATED WITH BRANCH DIEBACK OF OLIVE IN ANDALUSIA REGION (SOUTHERN SPAIN)

CARLOS AGUSTI BRISACH, JOSÉ PABLO JIMÉNEZ URBANO, MARÍA DEL CARMEN RAYA ORTEGA, ANA LÓPEZ MORAL, ANTONIO TRAPERO CASAS

UNIVERSIDAD DE CÓRDOBA AGRONOMÍA

Branch dieback of olive has been traditionally associated with *Neofusicoccum mediterraneum* in Andalusia region (southern Spain). Previous studies suggested that there are other fungal species affecting vascular tissues which could be also associated with this syndrome in Spain. However, these fungal species have not been described yet in Spain causing branch dieback of olive. Thus, in this study we characterize a collection of eight fungal isolates recovered from olive trunk samples showing internal discoloration and necrotic xylem vessels. Colony colour, mycelial growth, conidial characteristics and conidial production were defined on PDA, MEA and OA. Phenotypic characteristics and conidial production varied markedly depending on the isolated and culture media evaluated. The effect of temperature on mycelial growth was evaluated on PDA. The isolates show low mycelial radial growth (0.7-2.0 mm/day) and the optimum temperature ranged from 23.1 to 30.6°C. Phylogenetic analyses of ribosomal genes (ITS) and the functional protein regions ACT and TUB were performed to confirm their identification. The species *Acremonium* sp., *Cadophora luteo-olivacea*, *Paracremonium inflatum*, *Phaeoacremonium alvesii*, *Ph. minimum*, *Ph. scolytri* and *Pseudophaeo-monilla oleae* were identified. Pathogenicity tests were conducted on one-year old olive potted plants of cultivar Arbequina inoculated by mycelial plugs in contact with the vascular tissues. Additionally, isolates of *C. luteo-olivacea*, *Ph. minimum* and *Phaeo-monilla chlamydospora* collected from grapevines showing decline symptoms were included in the pathogenicity tests for comparative purposes. This work is relevant because it represents the first study on aetiology of fungal vascular diseases associated with branch dieback of olive in Andalusia region.