

APPLIED
AGRO -
BIO
TECH
NOLOGY
International Meeting

NEW APPROACHES FOR A
QUALITATIVE VALORIZATION
OF THE OLIVE OIL SECTOR

30-31 MAY 2023

BEJA, PORTUGAL

BOOK OF ABSTRACTS

INVITED SPEAKER



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KEYWORDS

olive viruses
antimicrobial peptides
virus-induced gene silencing
plant protection

OLIVE VIRUSES: PLANT PATHOGENS OR PLANT PROTECT AGENTS?

Harmful symptoms in olive trees such as chlorotic lesions, defoliation, fruit and leaf deformation, stem and tree death, and poor olive oil quality are currently associated with viruses. In Portugal, virus affecting olive trees have been studied since the 90's, and to date eleven virus have been detected in Portuguese olive orchards, out of a total of 17 detected worldwide in this host. Viral diseases are not treatable in an agronomic context and knowledge of these agents, and their epidemiology, is mandatory to establish and improve sanitary regulations and early detection tools. In dozens of olive orchards sampled in the north and south of Portugal, infection rates reach up to 100%. In these surveys, virus belonging to the Alpha- and Beta-necrovirus genera were the most prevalent. Viral genomes were molecular characterized, and their replication strategies have been studied, allowing the design of molecular tools for accurate diagnosis of olive viruses. Despite their harmful effects, viruses have the ability to move inside the plants and can be useful vectors to be developed for general biotechnology. The well-known viral genomes of necroviruses, mainly in the context of their pathogenic interactions with host plants, led us to design vectors for plant protection use i) based on virus-induced gene silencing (VIGS), using the natural plant gene silencing strategy to protect plants against viruses; ii) based on the expression of antimicrobial peptides (AMPs), using the ability of virus genome replication to produce antibiotics and antifungal molecules to prevent diseases caused by bacteria and/or fungi; and iii) based on CRISPR technology for gene editing. The presence of these viral vectors in plants confers them protection against specific untreatable or harmful diseases, leading us to reduce chemical treatments and to increase production.

Acknowledgement and Funding

M. Patanita and J.A. Ribeiro are supported by Portuguese National Funds through FCT/MCTES under the PhD scholarships (SFRH/BD/145321/2019 and 2022.13638.BD, respectively). This work is also funded by National Funds through FCT under the Project UIDB/05183/2020.