



35th

*Symposium of the European
Society of Nematologists*

*Cordoba, Spain
15-19 April, 2024*



Organize:

European
Society of
Nematologists

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224. Importance of volatile compounds on the infection cycle of Pine Wilt Disease (PWD)

Ana Fundurulic¹, Jorge M. S. Faria¹, Maria L. Inácio¹

1 INIAV, I.P., National Institute for Agrarian and Veterinary Research, Oeiras, Portugal

2 GREEN-IT Bioresources for Sustainability, Instituto de Tecnologia Química e Biológica, Universidade Nova de Lisboa (ITQB NOVA), Oeiras, Portugal

Area: Integrated Management of Plant-Parasitic Nematodes

Type: Poster

Keywords: plant parasitic nematodes, volatile organic compounds, early detection, plant health

ABSTRACT:

The plant parasitic pinewood nematode (PWN), *Bursaphelenchus xylophilus*, causes pine wilt disease (PWD) in susceptible pine trees. In Europe, PWD greatly impacts the Iberian pine forests, leading to economic losses in the wood industry. The early detection and faster monitoring in the field, in plant nurseries, or at border transport entrance points is of the utmost importance if this disease is to be contained. The utilization of volatile organic compounds (VOCs) for the detection of plant diseases relies on the fact that when plants are subjected to pathogenic agents, they elicit distinct VOC emissions in response. The analysis of these VOC signatures can provide a non-invasive approach for the early detection of PWD. However, in the PWD disease complex, several organisms contribute to VOC emissions, making disease detection more intricate. Furthermore, specific VOC profiles associated with early infection, symptom development, and advanced stages of PWD may differ. Addressing these challenges is necessary for the development of reliable and practical VOC-based diagnostic tools, enhancing the overall capacity for early PWD detection and monitoring. In this work the main VOCs reported to have an influence in several stages of the PWD infection cycle were reviewed and analyzed according to their chemical composition. Examining contributing VOC emissions during the PWD infection cycle allows the identification of reliable biomarkers for disease detection. These biomarkers can be employed not only in greenhouse conditions but also in the field to assess plant health.

Funding: This work was supported by the EU under the PurPest project through grant agreement 101060634 and by the Post-doctoral Research Grant 08/2023/BIPD.