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# Fungal diversity associated with Pine Wilt Disease as a source of novel biopesticides

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Microbiota can influence Pine Wilt Disease, a forest pathology arising from the interaction of the pinewood nematode (PWN) *Bursaphelenchus xylophilus*, its insect-vector *Monochamus* sp., and susceptible pine hosts. Pine mycobiota is known to affect PWN reproduction and development.

Metagenomics was used to detail the structure and dynamics of the PWN-fungi interactions in susceptible maritime pines (*Pinus pinaster* Aiton.) from two of the most affected areas in Portugal, Seia and Tróia.

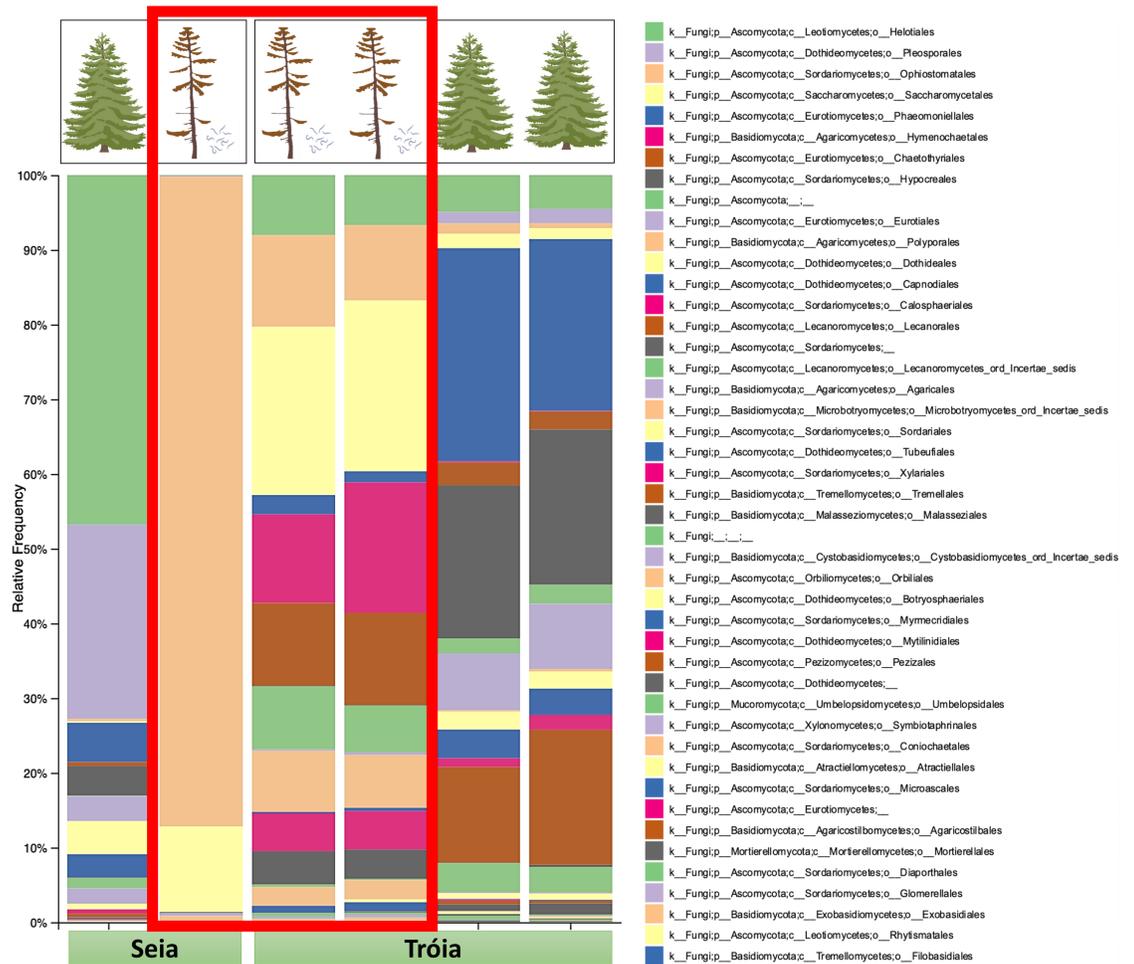


FIGURE 1 – Comparative analysis of fungal communities in *Pinus pinaster* trees infected by the PWN, and showing visible PWD symptoms, and PWN-free pines (control), in Seia and Tróia municipalities.

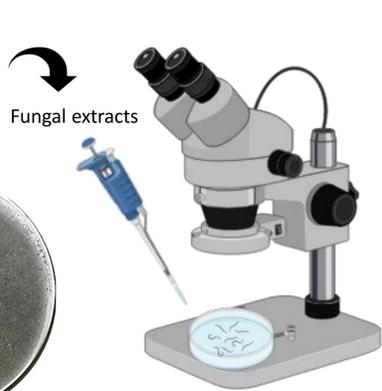
Infected pines were dominated by fungi from the Ophiostomatales order (Ascomycota, Sordariomycetes). In Seia, 55% were from *Ophiostoma* genus, 31% from *Leptographium* and 0.6% from *Sporothrix*. In Tróia, only 6% were from *Ophiostoma* genus and 4 to 6% from *Sporothrix*. Unaffected trees were dominated by Helotiales (Ascomycota, Letiomycetes), Pleosporales (Ascomycota, Dothideomycetes) and Phaeomononiellales (Ascomycota, Eurotiomycetes). In these individuals, Ophiostomatales were almost undetected.



*Ophiostoma* sp.



*Leptographium* sp.



Fungal extracts

Fungi were isolated, cultured and tested in feeding assays with the PWN. *Ophiostomales* isolates inhibited PWN growth, up to 59 %, when compared to PWN growth in *Botrytis cinerea*. Future assays will screen fungal extracts for nematocidal compounds through direct contact bioassays and identify target compounds through LC-Q-TOF-MS.

Fungi isolated from *Pinus pinaster* infected with PWN

