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Biodiversity on interaction of *Phytophthora cinnamomi* phytopathogen with forest and non-forest host

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Phytophthora cinnamomi Rands (Pc), is one of the phytopathogen with the highest impact causing crown rot, trunk canker, and root rot on forest and non-forest species including Chesnut, Quercus, avocado, or tomato. The life cycle of Pc involves the production of asexual motile high virulence zoospores (Zs), allowing the dispersion of them through soil and water currents by the aquatic environment, establishing a high biodiversity on below-ground interactions with several hosts. Despite the high biodiversity on virulence and impact of this phytopathogen, the knowledge we have about the management and physiology of Zs under strictly controlled conditions, to study and follow the infection process on plants remains still scarce. In this poster, we show how we mimic nature in the laboratory, inoculating plants with Zs and studying the survival of Zs and the infection process in the non-forest system host tomato. This pathosystem allowed us to compare and study the biodiversity on the modes of infection of *Pc* with forest host. The physiology of Zs and the plant response to Pc were studied by different techniques including fluorescence, QRT-PCR, and RNA sequencing, allowing us to extend the current knowledge we have about the biodiversity and capacities of Pc to interact in belowground environment with forest and non-forest plant species.

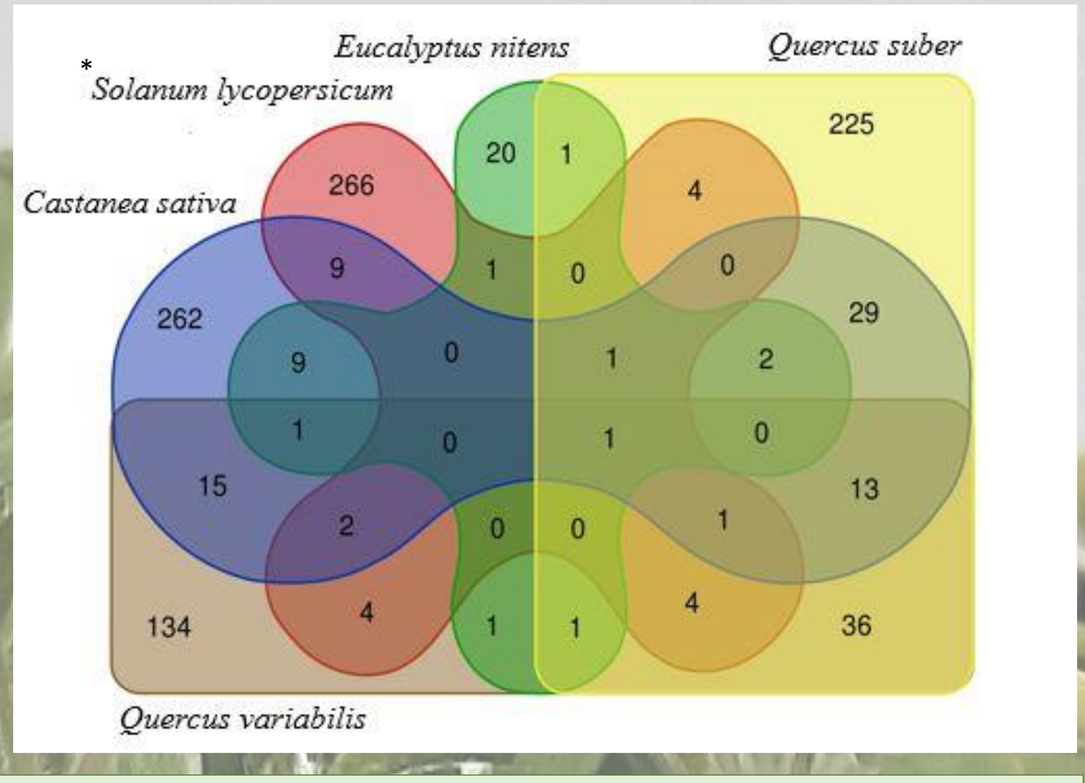

Figure 4. –Comparative transcriptomic analysis of plant responses to Pc. Venn diagram obtained from public data (2-5, * this work), made with orthologous genes up-regulated by Pc (FDR ≥ 2). (https://bioinformatics.psb.ugent.be/webtools/Venn/)

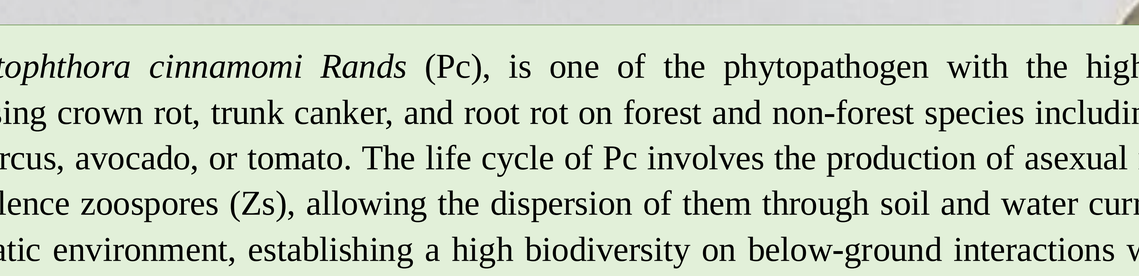

Figure 1. – Viability of Pc. Zs survival was measured by colorimetry signal produced by mitochondrial reductase activity (1). **A**. Bright image of Zs (40x). Bar: 15 µm. **B.** Calibration line obtained from serial dilutions of Zs culture (600nm).

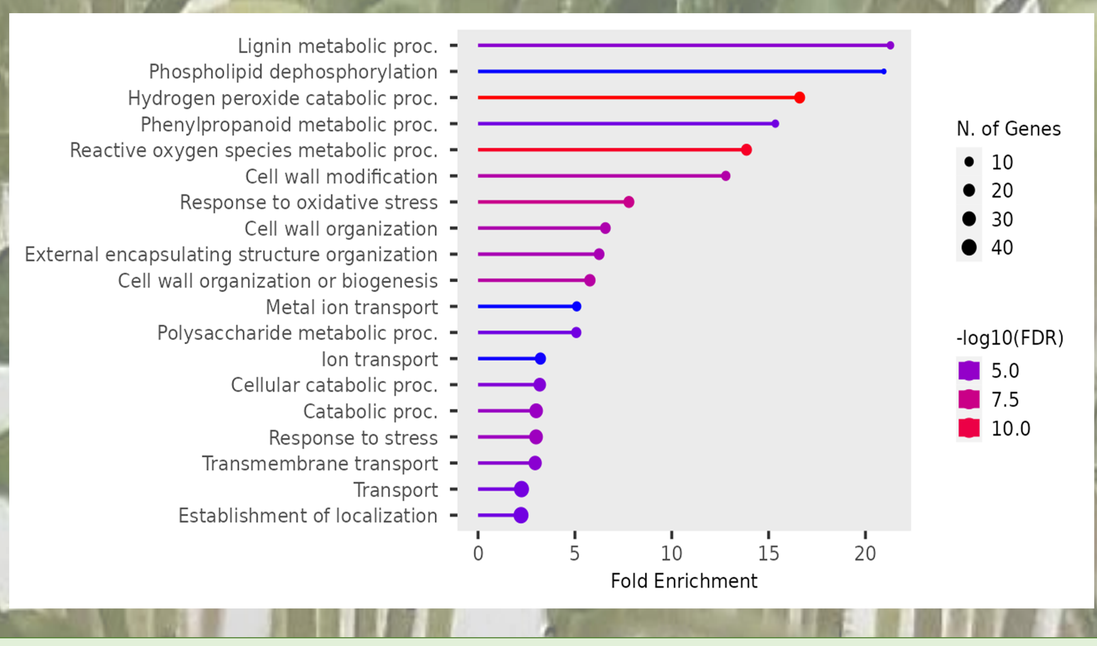

Figure 5. – Gene enrichment analysis of tomato seedlings responding to Pc. ShinyGO 0.77 (5) (http://bioinformatics.sdstate.edu/go/)

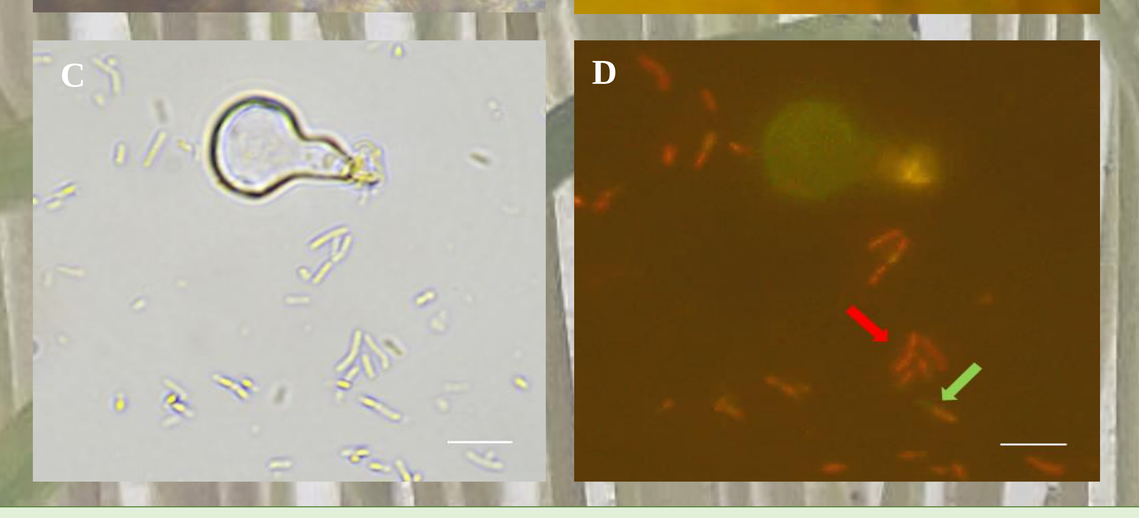

Figure 2. – Motility of Pc. Pc stained with a survival fluorescence marker, red and green signals corresponds to death or alive cells or structures, respectively (arrowed). **A-B.** Sporangia and Zs (bright and fluorescence). **C-D**. An empty alive sporangia and death Zs. Images correspond to 40x. Bars: 20 µm.

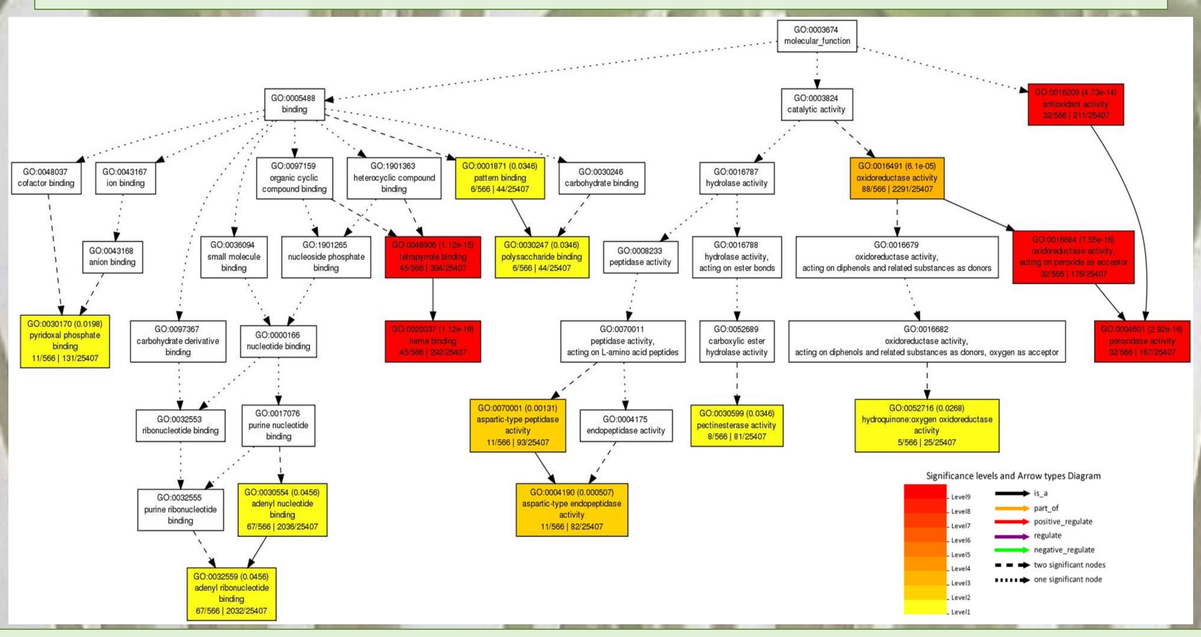

Figure 6. – Gene ontology (GO) enrichment analysis. GOs of tomato seedlings responding to Pb at 3dpi, obtained from ITAG4.0 (FDR ≥ 2), AgriGO 2.0 (6). (http://systemsbiology.cau.edu.cn/agriGOv2/)

Figure 3. – Symptoms of tomato seedlings infected by Pc. A. Controls. **B.** Eighteen days old seedlings growth on soil, after 4 dpi with 10^8 Zs/ml. Bars: 1cm.

References

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