**Differential transcriptomic profiling of white lupin response**

**to *Colletotrichum lupini*, the causal agent of anthracnose**

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White lupin (*Lupinus albus* L.) is a cool season grain legume, valued for its high seed protein content and beneficial influence on soil fertility through phosphorus mobilization and symbiotic nitrogen fixation. However, it is very susceptible to anthracnose, a devastating disease caused by the fungus *Colletotrichum lupini* (Bondar) Damm, P.F. Cannon & Crous 2012. Increased quantitative resistance has been reported in a few Ethiopian landraces [1] and in two German cultivars, Frieda [2] and Celina. As a hemibiotrophic pathogen, *C. lupini* propagates and kills the host tissue if not hampered at the biotrophic stage.

To identify the molecular mechanisms involved in white lupin resistance to anthracnose we focused on transcriptomic profiling of early stages of plant response to inoculation with *C. lupini*. The plant material tested in a growth chamber consisted of six lines, including the resistant Ethiopian landrace P27174 and cultivar Celina, two breeding lines selected for improved resistance, and two susceptible cultivars (Start and Amiga). The plants were spray-inoculated at 4-6 leaf stage with *ca*. 106 spores/ml suspension. Upper leaves were sampled simultaneously from inoculated and control plants (5 replicates) at 10 time points after inoculation, densely covering the time span from 1 to 48 hours, and additionally at 5 and 9 days post inoculation. Following RNA isolation and sequencing (paired-ends, 2x150 bp, ~60 mln reads), differential gene expression profiling with Gene Ontology enrichment and weighted gene co-expression network analysis were performed.

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***References:***

[1] Adhikari K.. et al, 'Identification of anthracnose resistance in Lupinus albus L. and its transfer from landraces to modern cultivars’ Crop and Pasture Science, vol. 60, 2009, p. 472-479.

[2] Alkemade J.A. et al, 'Genome-wide association study reveals white lupin candidate gene involved in anthracnose resistance’ Theoretical and Applied Genetics, vol. 135, 2022, p. 1011-1024.