Exploring and characterising the role of volatile organic compounds from aromatic plants to disrupt interactions between grapevines and the insect vector, *Scaphoideus titanus*

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Flavescence dorée (FD) is a devastating phytoplasma disease that threatens European grapevines. The leafhopper *Scaphoideus titanus* is the primary vector of FD, and its management relies only on pesticides. To reduce this reliance, I aim to understand the potential of chemical cues - specifically volatile organic compounds (VOCs) emitted by aromatic plants - to mediate plant defences and disrupt vector behaviour. Unlike most studies focusing on annual crops, during my PhD I will investigate how specific thyme chemotypes influence the behavioural and physiological interactions between grapevine cultivars and *S. titanus*. Thyme chemotypes synthesise large amounts of VOCs that may induce plant defences in receiver plants or directly affect the behaviour of pests. **First**, I will compare the host suitability of four grapevine cultivars differing in their sensitivity to the vector. Short-term host preference of *S. titanus* will be evaluated using two-choice assays on whole plants and leaf discs. Long-term acceptance and host suitability will be evaluated in cages by measuring different fitness proxies (e.g. survival, developmental time, etc). **Second**, feeding behaviour of *S. titanus* is a key step in phytoplasma transmission; therefore, I will use electropenetrography (EPG) to evaluate access to and phloem ingestion by *S. titanus* on the four grapevine cultivars and characterise their resistance to the pest. **Third**, I will assess the effectiveness of aromatic plant VOCs on *S. titanus* behaviour and performance. EPG and performance assays will be repeated on the two extreme grapevine cultivars after pre-exposure to different thyme chemotypes to determine whether aromatic plant VOCs induce resistance in grapevine, leading to altered feeding behaviour or reduced performance of the pest. Overall, my PhD aims to identify cultivar x chemotype combinations capable of improving pest management of *S. titanus*, contributing to more sustainable solutions for modern agriculture.

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