



Deciphering microbial interactions between grapevine pathogens and the leaf microbiome

Corinne VACHER

Directrice de recherches

INRAE, UMR Biogeco, Pessac, FRANCE

Abstract

Grapevine leaves are colonized by a multitude of microorganisms that affect, positively or negatively, plant health and growth. Pathogen species, including *Erysiphe necator* (powdery mildew) and *Plasmopara viticola* (downy mildew), are among the key players. When these pathogens colonise the grapevine leaf, they encounter the resident microbiome, which can act as a barrier to their growth through direct ecological interactions, such as exploitative competition, interference competition (antibiosis), and hyperparasitism. A current challenge is to identify members of the resident microbiome that naturally regulate mildews, and identify the biodiversity management practices that favour these natural antagonists. To decipher ecological interactions between pathogens and the leaf microbiome, we inferred microbial networks from metabarcoding datasets describing microbial communities associated with symptomatic and asymptomatic leaf samples in several wine-producing regions. Interaction networks revealed subnetworks of interest, centered on pathogen species (*E. necator* or *P. viticola*) and putative antagonists or facilitators. Some of the antagonistic interactions were known, others were novel and could be options to control disease development. This approach could be used to highlight small microbial consortia of interest, whose dynamics and interactions will then have to be studied experimentally to develop the microbial biocontrol of grapevine diseases and move towards pesticide-free viticulture.