Antifungal activity of hops extracts against the wheat pathogen *Zymoseptoria tritici*

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Searching for alternative methods to conventional pesticides against crop pathogens is an important challenge. In this way, we tested the potential of hops extracts to be used as a bio-fungicide towards *Zymoseptoria tritici*, the main pathogen on wheat crops in France and Europe[1,2]. Hops is known for its numerous biological properties such as antiviral, antibacterial and antifungal potential for human health[3], but it has not been yet studied for its activity against plant pathogens.

Different crude extracts, obtained using an ethanol/water mixture-based extraction from different parts of hop plant (leaves, stems, roots and female cones), were assessed for their activity against the *Z. tritici* pathogenic strain T01193. The antifungal assays were performed using a spotting test that carried out in Petri dishes containing potato dextrose agar medium amended with different concentrations (1.25, 0.62, 0.31, 0.15 and 0.07 $g.L^{-1}$) of each extract. Dose-response curve analyzes revealed that only the female cone extract significantly decreased fungal growth, with a minimal inhibitory concentration of 1.25 $g.L^{-1}$ and a half-maximal inhibitory concentration of 0.95 $g.L^{-1}$. A fractionation of the female cone extract using centrifugal partition chromatography allowed the purification of several metabolites. Further investigations are in progress to determine which metabolites are responsible for the highlighted activity. Additional investigations on other major plant pathogens will also be performed.

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Keywords: bio-fungicides; hops; wheat; *Zymoseptoria tritici*

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