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Wood/forest and vine by-products as sources of new drugs for sustainable strategies to control fungal growth and type B trichothecene production by *Fusarium graminearum*

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Fusarium Head Blight (FHB) of small-grain cereals such as wheat and barley and Gibberella Ear Rot (GER) of maize are two devastating fungal diseases affecting crops worldwide. Both FHB and GER are primarily caused by *Fusarium graminearum* in Europe. In addition to direct losses related to yield reduction, *F. graminearum* poses potential health risks to animals and humans due to the production of type B trichothecene (TCTB) mycotoxins. The development of environmental-friendly strategies guaranteeing the safety of food and feed is a key challenge facing agriculture today. One of these strategies lies on the promising capacity of products issued from natural sources to counteract crop pests.

In these works, the *in vitro* efficiency of extracts obtained from wood/forest and vine by-products using both classical and subcritical water extractions was assessed against fungal growth and TCTB production by a panel *F. graminearum* strains. Maritime pine sawdust and vine root extracts were shown to be extremely efficient, leading to a significant inhibition higher than 90% of the fungal growth and a higher than 65% reduction of the mycotoxin production by *F. graminearum*. High-resolution LC-MS/MS analysis of natural active extracts revealed the presence of several families of phenolics with a predominance of methylated compounds and suggested that the abundance of these structures, and therefore of hydrophobic compounds, could be a primary factor underpinning the activity of the natural extracts. In addition, a bioactivity molecular networking strategy applied to the LC-MS/MS data of the extracts allowed us to suggest that oligomeric phenolic structures are the active molecules. These hypotheses are currently being tested using a biofractionation strategy and *in vitro* assays with pure molecules.

Altogether, our data support that wood/forest and vine by-products could be promising sources of bioactive compounds for controlling *F. graminearum* and its production of mycotoxins.