Investigation of biobased compounds derived from Hypholoma genus for the formulation of phytotoxic biocontrol products

Peng Xiaohui*[1], Yaouba Souaibou*[1], and Ludivine Valois*[2]

[1]Institut Pluridisciplinaire Hubert Curien – IPHC UMR 7178 – France
[2]Equipe de Chimie Analytique des Molécules BioActives, Université de Strasbourg, CNRS, IPHC UMR 7178 – IPHC UMR 7178 – France

Résumé

Long-term overuse of chemical herbicides has caused weed resistance, environmental pollution, and harm to non-target organisms. There is an urgent need for eco-friendly and sustainable alternative as bioherbicides to support green agricultural development. *Hypholoma* fungi are widely distributed saprotrophic macrofungi that grow on decaying wood. They produce diverse bioactive secondary metabolites including terpenoids, sesquiterpenoids, sterols, phenolic derivatives, and fatty acids, some of which have reported biological activity. Preliminary data generated in our laboratory revealed that the aqueous extract of *Hypholoma fasciculare* exhibited promising phytotoxic activity. This observation leads to the hypothesis that other macrofungi species within the same genus may possess similar bioactive properties. In this study, a preliminary herbicidal activity screening was conducted on 12 extracts obtained from 4 *Hypholoma* species of which 2 are synonyms: *Hypholoma fasciculare*, *Hypholoma capnoides* and *Hypholoma lateritium*, using garden cress (*Lepidium sativum* L.) seeds as the model target plant. The results indicate that three ethyl acetate extracts and one water extract exhibited interesting herbicidal activity reducing both germination rates and radicle length. The same results also show that the three investigated species exhibit moderate phytotoxic activity towards cress seeds. In order to identify the active phytotoxic compounds, a first HPLC-UV method was developed to separate the targeted compounds from the active extracts. This step will be followed by an online fractionation and the implementation of the *in-vitro* herbicidal assay. These final steps will allow highlighting the more active fractions and the corresponding active molecules.

Mots-Clés: Macrofungi, Hypholoma, phytotoxic activity, bioherbicides, bioguided fractionation.

*Intervenant