

Screening of essential oil as potential post-harvest biofungicide

Dal Maso S. (1), De Clerck C. (1), Parisi O. (1), Zhiri A. (2), Jijakli MH. (1).

(1) *Integrated and Urban Plant Pathology Laboratory, 2 Passage des Déportés 5030 Gembloux Belgium*

(2) *Pranarôm International s.a., 37 Avenue des artisans 7822 Ghislenghien*

Plant extracts, such as essential oils (EOs), have been known for centuries for their ability to prevent and/or to cure diseases through their fungicidal and bactericidal effect.

In this project we evaluated the fungicidal activity of 90 essential oils on several pathogens associated with post-harvest diseases (*Botrytis cinerea*, *Penicillium expansum*, *Pectobacterium atrosepticum* and *Pectobacterium carotovorum*). The efficacy of the EOs was first tested *in vitro* using 96 wells ELISA microplates.

This step allowed the selection of 9 EOs, sufficiently effective (complete growth inhibition up to 72 hours of contact with pathogen in liquid of medium) against these pathogens to be tested under *in-vivo* conditions.

The phytotoxicity of the selected EOs was then tested on apples, pears and potatoes. While no phytotoxicity was observed when the EOs were applied on intact fruits and tubers, a clear toxicity was observed when EOs were applied on wounded fruits.

For the EOs showing a moderate toxicity, the *in-vivo* tests were carried on by inoculating the pathogens into wounded apples (*P. expansum*), pears (*B. cinerea*) and potatoes (*P. atrosepticum* and *P. carotovorum*) treated with lower EOs concentration.

At these concentration, the EOs showed less phytotoxicity but also a lower efficiency (30% in the best case).

To conclude, while the EOs showed good results *in-vitro*, the efficiency *in-vivo* was too low at the concentration tested in order to be used as a way to control post-harvest diseases.

Key words: *essential oils, fungicide*