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BOOK OF ABSTRACTS



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***In vitro* inhibition of *Aspergillus carbonarius* growth and reduction of Ochratoxin A (OTA) contents using *Lactobacillus plantarum* strains isolated from coffee cherries**

Beugré G. Corinne^{1,3} (corinneg_2008@yahoo.fr), Kedjebo K. B. Didier², Kouame M. K. Justin², Durand Noël³, Fontana Angélique⁴, Guehi Tagro S.¹

¹Unité de Formation et de Recherche des Sciences et Technologies des Aliments, University Nangui ABROGOUA, Abidjan, Côte d'Ivoire ; ²Unité de Formation et de Recherche des Sciences et Technologies des Aliments., University Nangui ABROGOUA, Abidjan, Côte d'Ivoire ; ³UMR Qualisud, CIRAD, Montpellier, Occitanie, France ; ⁴UMR Qualisud, Univ Montpellier, Montpellier, Occitanie, France

RATIONALE

Coffee is one of the main agricultural crops in the world. Raw coffee cherries can contain the mycotoxin ochratoxin A (OTA). OTA is produced by several species of *Aspergillus* and *Penicillium*. International coffee organizations pay more and more an attention on statutory limits for OTA in Coffee products (FAO, 2006). OTA contents need to be reduced in coffee cherries to as low as technologically control of mycotoxin by avoiding fungal growth and OTA production.

METHODS

Identification of lactic bacteria (LAB) and *Aspergillus carbonarius* strains isolated from Ivorian coffee cherries were carried out using microbiological and molecular methods. Study of effect of cells and supernatant of liquid culture of *L. plantarum* strains were investigated on the growth of ochratoxinogenic *A. carbonarius* strain using various confrontation tests *in vitro*. Then, the best potential fungal growth inhibitor and OTA content reducing strains were inoculated with coffee cherries during post-harvest processing on farm. Fungal growth was measured by weighing the biomass during the incubation and at the end of coffee cherries drying. Samples of OTA contents reduction experiments were analysed by HPLC-FLD method (Sueck *et al.*, 2019).

RESULTS

Five OTA-producing *A. carbonarius* strains were detected. Sixteen isolates of LAB including 12 *Lactobacillus plantarum* strains, 2 *Weissella confusa* strains, 1 *L. pentosus* strain and 1 *W. paramesenteroides* strain. Ten strains of LAB showed potential activity with rates (17.3-79.1 %) against fungal growth and capacities to reduce OTA contents (6-96 %). Among these LAB, 7 strains of *L. plantarum* showed highest antifungal activities. Cells of LAB strains had highest inhibitory effect on fungal growth and reduction of OTA contents. On the farm, only the inoculation of *L. plantarum* D12 with coffee cherries result in reduction of OTA content without inhibition of fungal growth.

CONCLUSION & PERSPECTIVES

The inoculation of specific *L. plantarum* with the coffee cherries on the farm results in decrease of OTA level without inhibition of fungal growth. Using *L. plantarum* D12 strain could allow to control and reduce to as low as biotechnologically promising and excellent way in coffee cherries and probably in other foodstuff. The further study may be performed on the comprehension of OTA reduction mechanism.

References:

- FAO, 2006. Reducing ochratoxin A in coffee. <<http://www.coffee-ota-org>> (03.02.19).
- Sueck *et al.*, 2019. Toxins 2019, 11, 329; DOI:10.3390/toxins11060329.