

ABSTRACT

Biological activities of some Plant-Associated *Bacillus sp.* and *Paenibacillus sp.* upon growth in root exudates of Maize (*Zea mays*) and Tomato (*Lycopersicon esculentum*) varieties cultivated in Democratic Republic of Congo (DRC)

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Plant-Associated Bacteria (**PAB**) revealed many potentialities for plant protection against phytopathogens. To protect plant against these enemies, PAB produce bioactives compounds such as Cyclic Lipopeptides (CLPs). These molecules can act via many ways like induced systemic resistance in the host plant and antibiosis. In practice, PAB are applied either in the soil or on the phylloplan.

The aim is to evaluate the ability of PAB to colonize the roots of maize and tomato and to produce various CLPs: surfactins (SF), fengycins (FN), iturins (IT) and fusaricidins (FU).

Wild types strains *Bacillus velezensis* GA1, *B. v.* S499 and *Paenibacillus polymya* 56 were tested. Roots exudates (REs) were collected from one variety of maize and three of tomato. The PAB were cultivated in REs collected from those plants. Their growth was evaluated by Optical Density and CPL production was analyzed by using UPLC-MS.

We found that these PAB can grow in the REs of these 2 plants. Growth was better in maize (S499: $0,091 \pm 0,022$; GA1: $0,071 \pm 0,006$; Pp56: $0,074 \pm 0,002$) than in tomato even if low comparatively to the control (LB medium). About CLPs production, all PAB were able to produce interesting biomolecules involved in biocontrol of phytopathogens. SF, FN and IT were produced by GA1 and S499 in maize and tomato exudates. Pp56 produces FU, another kind of CLP with antimicrobial activity and specific for this bacterium.

PAB tested could be used to protect plant against soil-borne pathogens because they can most probably colonize the roots of maize and tomato based on their capacity to use exudates for growth and based on their ability to efficiently form CLPs which represent major compounds involved in the antagonistic activity against fungi as suggested by our bioassays.

References

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