



The Antimicrobial Activity Potential of Plant Growth Prompting Lactic Acid Bacteria Against Broad Spectrum of Phytopathogens

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Abstract:

Lactic acid bacteria (LAB) have been known as a promising biocontrol agent against plant pathogens. However, the reported isolates represented the antagonistic effects merely against the limited number of bacterial or fungal phytopathogens. Accordingly, we aimed to screen LAB isolates possessing inhibitory activities against a broad spectrum of plant disease causal agents within one of the most important agricultural areas, Mazandaran, Iran. Additionally, the plant growth promoting (PGP) properties were evaluated to introduce the valuable isolates to be apply in biological practices for reducing the chemicals consumption.

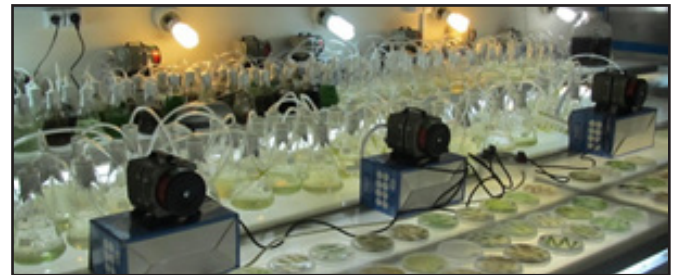
The LAB were isolated from field and forest soils as well as livestock manure samples. The in vitro experiments was performed to assess the antifungal and antibacterial activities.

Results indicated that the LAB isolates could significantly ($P > 0.05$) inhibit the growth of tested bacteria and fungi in comparison to control. Seven LAB isolates exhibiting the most antagonistic activity were selected and identified molecularly as *Lactobacillus plantarum* (LAB 1, LAB 18, LAB 19); *L. zeae* (LAB 5, LAB 13); and *L. casei* (LAB 8, LAB 6). Moreover, all selected isolates were able to bio-synthesis indole-3-acetic acid (IAA), nitrogen hydroxide (NH₃), and hydrogen cyanide (HCN). The isolates LAB 6, LAB 8, LAB 19 could produce siderophore on chrome azurol S (CAS) agar and the LAB 6 and LAB 19 were found to solubilize phosphate on Pikovskaya (PVK) agar medium.

Hereby, the LAB 19 and LAB 6 had the most antagonistic activity against all tested pathogens as well as PGP properties. However, the efficiency of the isolates under field and greenhouse conditions remain to be determined.

Biography:

Ramtin Vamenani is a researcher by profession and works



with one of the private agrochemfactory in Iran (Arman Sabz Adineh). He holds an MSc in Plant Pathology and currently seeking for a PhD position in Molecular Biotechnology or Plant Pathology in one of the high-ranking Universities around the world. Ramtin has 4 years of experience as a researcher at Genetics and Agricultural Biotechnology Institute of Tabarestan and 2 years of experience as R&D manager at Arman Sabz Adineh Co. He has published three English manuscripts about Viroids in Iranian journal of Virology, Iranian journal of plant pathology, and recently in journal of Phytopathology. Ramtin grew up in Behshahr, Mazandaran province and moved to Tehran, the capital of Iran, and is passionate about controlling plant diseases and improving sustainable agriculture.

Publication of speakers:

1. Dalié, D. K. D., Deschamps, A. M., & Richard-Forget, F. (2010). Lactic acid bacteria–Potential for control of mould growth and mycotoxins: A review. *Food control*, 21(4), 370-380
2. De Vuyst, L., & Leroy, F. (2007). Bacteriocins from lactic acid bacteria: production, purification, and food applications. *Journal of molecular microbiology and biotechnology*, 13(4), 194-199.
3. O'sullivan, L., Ross, R. P., & Hill, C. (2002). Potential of bacteriocin-producing lactic acid bacteria for improvements in food safety and quality. *Biochimie*, 84(5), 593-604.

Emerging Trends in Plant Science and Natural Products Research, March 19-20, 2020; London, UK

Citation: Ramtin Vamenani; The Antimicrobial Activity Potential of Plant Growth Prompting Lactic Acid Bacteria Against Broad Spectrum of Phytopathogens; Natural Products 2020; March 19-20, 2020; London, UK