AP-24: Characterization of the Trypsin Protease Gene from *plantarum* VF3

ZATER Zohra Yasmine [1]*, MERZOUG Mohamed [2], ZERGUI Amina [3]

[1]Laboratory of Biology of Microorganisms and Biotechnology, University of Oran 1Ahmed Ben Bella, Oran, Algeria.
[2] Higher School of Biological Sciences of Oran, Oran, Algeria.
[3] Laboratory of Applied Microbiology, Department of Natural Sciences, University ofOran 1 Ahmed Ben Bella, Oran, Algeria.

Email* : ***zater.yasmine@edu.univ-oran1.dz***

Subject description: Trypsin protease is a crucial enzyme with diverse applications across various industries, including food, pharmaceuticals, and biotechnology. While extensively studied in eukaryotes, the trypsin from *Lactobacillus plantarum* VF3 presents intriguing differences in its structural and functional properties.

Objectives: This study aims to identify and characterize the gene encoding trypsin protease in *L. Plantarum* VF3, highlighting its distinct enzymatic features.

Methods: The *L. plantarum* VF3 strain, isolated from cow milk, was identified using the 16S rRNA gene method. Specific primers were employed for PCR analysis of the tlp gene, and the resulting products were sequenced using the BigDye™ Terminator v3.1 Cycle Sequencing Kit. The I-TASSER server was utilized for protein structure prediction andfunctional analysis.

Results and discussion: The investigation confirmed the presence of the tlp gene within the genome of *L. plantarum* VF3, highlighting a notable difference in its amino acid sequence compared to human trypsin. This divergence in sequence correlates with distinct catalytic properties, where lactobacillus trypsin displays enhanced specificity for substrates. These findings emphasize the distinctiveness of *L. plantarum* VF3 trypsin in its potential applications within the biotechnology and food industries, paving the way for novel enzymatic solutions with tailored properties.

Conclusion: This study elucidates trypsin protease's genetic basis and distinctivecharacteristics in *L. plantarum* VF3. The observed differences in sequence and catalyticproperties compared to eukaryotic trypsin open exciting possibilities for exploiting this enzyme in various industrial applications, ranging from food processing to biotechnology. Further research in harnessing these unique features promises innovative solutions in enzyme technology.

Keywords: Trypsin, *Lactobacillus plantarum*, 16S rRNA, PCR, I-TASSER, enzymetechnology.