

## Antimicrobial protein produced by *Bacillus subtilis* ATCC 21332 in the presence of *Allium sativum*

### ABSTRACT

**Introduction:** Proteins levels produced by bacteria may be increased in stressful surroundings, such as in the presence of antibiotics. It appears that many antimicrobial agents or antibiotics, when used at low concentrations, have in common the ability to activate or repress gene transcription, which is distinct from their inhibitory effect. There have been comparatively few studies on the potential of antibiotics or natural compounds in nature as a specific chemical signal that can trigger a variety of biological functions. **Objective:** To study the effect of *Allium sativum* in regulating proteins production by *Bacillus subtilis* ATCC 21332. **Methods:** The bacteria cells were exposed to the *A. sativum* at concentration of 0.025 MIC for 24 h. The extracellular proteins were then isolated and screening for antimicrobial activity before being further analyzed by using Sodium Dodecyl Sulfate Polyacrylamide Gel Electrophoresis (SDS-PAGE) and Liquid Chromatography-Tandem Mass Spectrometry (LC-MS/MS). **Results & Discussion:** The isolated extracellular proteins showed antimicrobial activity against selected Gram-positive and Gram-negative bacteria. Proteins profile showed that two new bands with approximate sizes of 51.36 kDA and 9.74 kDA were appeared for the treated bacteria with *A. sativum*. LC-MS/MS analysis revealed that four and two possible proteins were identified for each of isolated proteins with approximate sizes of 51.36 kDA and 9.74 kDA. **Conclusion:** *B. subtilis* ATCC 21332 in stressful condition with the presence of *A. sativum* at low concentration (0.025 MIC) could induce the production of bioactive protein with antimicrobial activity.

**Keyword:** Antimicrobial; *Allium sativum*; Proteins production; *Bacillus subtilis* ATCC 21332