TITLE: *In vitro* effect of cell-free supernatants from *Lactobacilli* cultures against multidrug resistant bacteria

AUTHORS: Queiroz, H.; Machado, G.; Santos, W.; Medeiros, N.; Ximenes, E.A

INSTITUTION: Universidade Federal de Pernambuco-Av. Professor Morais Rego, 1235 – 50670-901- Departamento de Antibióticos- Cidade Universitária, Recife - PE

ABSTRACT:

Lactic acid bacteria (LAB) are Gram-positive bacteria widely used in medicines and foods. Of this group, *Lactobacillus* is one of the main genus. The *Lactobacillus* species produce metabolites with antimicrobial activity such as bacteriocins, organic acids and hydrogen peroxide. These compounds have a wide application in the health and nutrition. Thus, the objective of this work were evaluate the antibacterial effect of four Cell Free Supernatants (CFSs) from *Lactobacilli* cultures against multi resistant bacteria. CFSs were obtained from these cultures after centrifugation at 7.500 rpm, 4ºC for 10 min. The supernatants were filtered through a 0.22 µm cellulose membrane and with them, organic acids (lactic acid and acetic acid) and ethanol were quantified by gas chromatography with Flame Ionization Detector (GC-FID), followed by determination of their antibacterial activities against *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, *Escherichia coli* multi drug resistants. GC-FID analysis of CFSs showed concentrations greater than 1,400.0; 180.0 and 16.0 mM for lactic acid, acetic acid and ethanol, respectively. All CFSs were able to inhibit all pathogenic bacteria evaluated. The percentage of inhibition of pathogenic bacteria was equal or greater than 70%. The antimicrobial activity was dependent on the CFSs tested. Based on these experimental data, organic acids and ethanol are likely to be responsible for this antimicrobial activity.

Keywords: CFS, Lactobacilli, GC-FID, Ethanol, organic acids

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