



ANTIMICROBIAL ACTIVITY OF ESSENTIAL OIL OF *Ligusticum porteri*

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Introduction.

Ligusticum porteri, also known as chuchupate or OSHA, is an endemic plant of the State of Chihuahua and Sonora. It has been widely reported that the Tarahumara etnia has used this plant as a remedy for gastrointestinal problems, as well as a supposed cure for tuberculosis. There are reports that *Ligusticum porteri* has a significant amount of Essential Oil (EO) which is responsible for a strong aroma and is also known as ping's herb. Essential oils are a mixture of chemicals from aromatic plants, that are water insoluble, mainly terpenes (1). Interest in the use of EOs is due to its broad-spectrum as antimicrobial agents (2). Considering that a large part of the world population relies on medicinal plants as its main alternative for the treatment of various diseases and there are reports of plants that produce active ingredients with biological activity of therapeutic significance, the present study provides determine the antimicrobial activity endemic plant *Ligusticum porteri*.

Methods.

The Minimum Inhibitory Concentration (MIC) of the essential oil of *Ligusticum porteri* was determined by the Alamar Blue technique. This technique is based on detection of metabolic cofactors in proliferating cell viability. The technique consists of making a series of dilutions in an ELISA plate adding 7H9CG broth, inoculum and the compound to be evaluated leaving incubate at 37 °C for 6 days; on the sixth day the reagent Alamar Blue 24 hour was added. In wells where the microorganisms are metabolically active, there is a point of change from blue to pink. The MIC was determined by the minimum concentration where no color change was observed by Alamar Blue (3). Antimicrobial activity was determined against bacterial strains related to gastrointestinal problems, respiratory diseases and nosocomial diseases. The oil was analyzed by a gas chromatograph coupled to a mass spectrometer using Perkin-Elmer Instruments NIST library for the recognition of the compounds. The separation was performed on a polar capillary column PE-5 (Methyl-phenyl - 5% SILICONE). Helium was used as carrier gas at a flow of 1 ml/min through the column.

Results.

The essential oils of *Ligusticum porteri* demonstrated antimicrobial efficiency, having a major effect on strains of *E. coli*, *E. faecalis*, *S. epidermidis* *S. aureus*. The results obtained are presented in Table 1. The genus *Pseudomonas* strains showed resistance to the essential oil, so that the antimicrobial activity failed to be determined based on concentrations used.

Table 1. Minimum Inhibitory Concentration of the compounds tested against *Mycobacterium bovis* strain AN-5.

Strain	MIC
<i>Escherichia coli</i>	100
<i>Bacillus cereus</i>	750
<i>Listeria monocytogenes</i>	500
<i>Salmonella typhi</i>	250
<i>Staphylococcus aureus</i>	100
<i>Enterococcus faecalis</i>	100
<i>Strespcoccus epidermidis</i>	100
<i>Shigella flexneri</i>	250
<i>Klebsiella pneumoniae</i>	750
<i>Klebsiella oxycola</i>	750
<i>Pseudomonas auriginosa</i>	> 1000
<i>Pseudomona florences</i>	> 1000

The MIC are expressed in ug/ml. Analysis was performed in triplicate for MIC determination.

Essential oil composition is of great interest since it is known that their roots monoterpenes have been identified: para-cymene, limonene, alpha and beta-phellandrene, alpha-pinene, alpha-terpinene and, diligustilido lactones, cis and trans-diligustilido, phthalide, and riligustilido butilidíneo. compounds that are likely to have an antimicrobial activity.

Conclusions.

The essential oils of *Ligusticum porteri* contains important components that should be studied as potential drug therapies, as well as base structures for the design of new agents with antimicrobial activity strengthened.

Therefore, it was actually conceptualized *Ligusticum porteri* plant has effective properties as a medicinal plant.

References.

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