

Investigation of Pharmacological Activity of the Pharmaceutical Forms from Summer Savory (*Satureja Hortensis*) Leaves Essential Oil

Anna Manjikian*

Department of Pharmacy, Yerevan State Medical University after M. Heratsi, Armenia



*Corresponding author: Anna Manjikian, Department of Pharmacy, Yerevan State Medical University after M. Heratsi, Armenia

Submission: July 31, 2020

Published: August 07, 2020

Volume 4 - Issue 3

How to cite this article: Anna Manjikian. Investigation of Pharmacological Activity of the Pharmaceutical Forms from Summer Savory (*Satureja Hortensis*) Leaves Essential Oil. *Nov Res Sci.* 4(3). NRS.000588. 2020. DOI: [10.31031/NRS.2020.4.000588](https://doi.org/10.31031/NRS.2020.4.000588)

Copyright@ Anna Manjikian, This article is distributed under the terms of the Creative Commons Attribution 4.0 International License, which permits unrestricted use and redistribution provided that the original author and source are credited.

Abstract

Background and Objectives: *Satureia hortensis* (summer savory) from *Lamiaceae* (labiatae) family is valuable by its rich existence of essential oil. Taking in account several pharmacological effect of mentioned genus essential oil's compounds, it was investigated the Armenian flora *Satureja hortensis* essential oil chemical composition, obtained pharmaceutical forms and studied antimicrobial, anti-inflammatory antinociceptive and wound healing activities. **Material and Methods:** *Satureia hortensis* essential oil chemical composition analysis was carried out by gas chromatography-mass spectroscopy (GC-MS) method. Antimicrobial effects of the essential oil were studied by disc-diffusion assay. The evaluation indicator for antimicrobial activity was the inhibited zone diameter in the Petri plates. The mentioned oil antinociceptive and anti-inflammatory activities have been estimated correspondingly in the "tail-flick" and xylene induced acute ears edema test of rats' experimental model. The rats were pretreated with 20, 50 and 100 mg/kg doses. The regeneration ability of the ointment from essential oil of Savory leaves under the condition of thermal burn has been studied. **Results:** Data obtained according to chemical analysis by GC-MS method have shown that *Satureja hortensis* essential oil contains 13 components. Carvacrol (42.262%) and β -terpinene (32.020%) characterized by high antimicrobial activity were found to be the main components in the essential oil. The results of the disk-diffusion method showed strong antimicrobial activity on the growth of pathogenic bacterial and fungal strains such as *Escherichia coli* ATCC 8739, *Staphylococcus aureus* ATCC 6538-P, *Pseudomonas aeruginosa* ATCC 2549, *Bacillus subtilis* ATCC 6633 and *Candida albicans* ATCC 10231. The obtained results evident that the highest antinociceptive activity of the mentioned oil registered in the dose 50 mg/kg for 62.95%.

Method

Taking into account the rich content of the plant compounds with anti-inflammatory, antimicrobial effects, the development of herbal pharmaceuticals for the treatment of pathological conditions accompanied by inflammation, pain and infections, remains one of the important tasks of pharmacy considering serious side effects of synthetic anti-inflammatory drugs and resistance to antimicrobial drugs as well.

Lamiaceae family plants are an important source for the essential oils and contain compounds with anti-inflammatory and antimicrobial activity. That is why for developing new medicines of herbal origin with the above-mentioned effects pharmaceutical forms based on essential oil of summer savory growing in Armenia were obtained and their anti-inflammatory, antinociceptive, antimicrobial activities and wound-healing effect were studied.

The analysis of gas chromatography-mass spectrometry combined method indicates, that investigated essential oil, separated by steam distillation, contains high quantity of aromatic mono and diterpenes with the prevalence of carvacrol (42.3%) and gamma-terpinene (32%). The medicinal raw material of summer savory leaves growing in Armenia have been identified preliminarily by light microscopy, and by the residual moisture detection (9.5%).

The anti-inflammatory activity of the essential oil was studied on rats' ear by xylene induced acute inflammation model. It revealed that this essential oil possesses anti-inflammatory activity among all the tested doses i.e. 20, 50 and 100 mg/kg (i/p), especially in 20 mg/kg dose, preventing the development of edema by 50.5%. The mentioned activity was confirmed by estimation of histological changes of inflamed tissue, indicating the ability of 10% ointment of the essential oil to prevent changes observed in the inflammation area.

Evaluation of antinociceptive activity of summer savory essential oil in indicated doses was performed by "Tail-flick" test of rats' tail thermal stimulation. Registration of rat tail withdrawing latent time demonstrated that the essential oil possesses expressed antinociceptive activity, which is pronounced in case of emulsified oil i/p injection in 50 mg/kg dose, at which the rat tail withdrawal latent time was increased by 95.8%.

Investigation of summer savory essential oil antimicrobial activity in vitro conditions by the disc-diffusion method have demonstrated that the studied essential oil inhibits the growth

of pathogenic bacterial and fungal strains such as *Escherichia coli* ATCC 8739, *Staphylococcus aureus* ATCC 6538-P, *Pseudomonas aeruginosa* ATCC 2549, *Bacillus subtilis* ATCC 6633 and *Candida albicans* ATCC 10231.

Wound healing ability of the 10% ointment based on summer savory essential oil was studied by the planimetric method of wound size estimation, pH evaluation in damaged tissue and characteristics of thermal burns wound surface microbial flora. The results obtained indicate that the application of the ointment is accompanied by burn surface decrease about 19% in average. The described effect is probably conditioned by inhibition of *Proteus mirabilis*, *Klebsiella*, *Escherichia coli* pathogenic microorganisms and prevention of increasing pH value under the tested ointment application.

Thus, anti-inflammatory, antinociceptive, antibacterial and wound healing properties of ointment based on summer savory essential oil growing in Armenia, suggest that investigated pharmaceutical form could be served as an effective agent for burnt wounds therapy.

For possible submissions Click below:

[Submit Article](#)