



**INTERNATIONAL SCIENTIFIC-
PRACTICAL CONFERENCE**

**CURRENT STATE AND PRIORITIES MODERNIZATION
OF SCIENCE, EDUCATION AND SOCIETY**

Book of abstracts



February 8, 2025

**Tampere,
Finland**





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UDC 37:082.2(06)

International scientific-practical conference “Current state and priorities
modernization of science, education and society”: conference proceedings
(Tampere, Finland, February 8, 2025). Tampere, Finland: Scholarly
Publisher ICSSH, 2025. 63 pages.

The proceedings of the International scientific-practical conference “Current
state and priorities modernization of science, education and society” featured
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підприємство “Український науковий фармакопейний центр якості лікарських засобів”, 2015. – Т. 1. – 1128 с.

5. Фармацевтичний аналіз: навч. посіб. для студ. вищ. навч. закл. / П.О. Безуглий, В.А. Георгіянц, І.С. Гриценко та ін.; за заг. ред. В.А. Георгіянц. – Х.: НФаУ: Золоті сторінки, 2013. – 552 с.

6. Інструментальні методи хімічного аналізу [Електронний ресурс] : навч. посіб. для студ. спеціальності 161 “Хімічні технології та інженерія” спеціалізації “Хімічні технології неорганічних керамічних матеріалів” / КПІ ім. Ігоря Сікорського; уклад.: Л.М. Спасьонова, В.Ю. Тобілко, І.В. Пилипенко. – Електронні текстові данні (1 файл: 1,85 Мбайт). – Київ : КПІ ім. Ігоря Сікорського, 2019. – 69 с.

УДК 615.322:582.929.4:616.31-002.828

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STUDY OF THE ANTIFUNGAL ACTIVITY OF THE TESTED COLLECTION OF *ORIGANUM VULGARE*, *JUGLANS REGIA*, *CALENDULA OFFICINALIS*, *HYPERICUM PERFORATUM*

Oral candidiasis is a fungal infection of the oral mucosa caused by yeast-like fungi of the genus *Candida*, most commonly *Candida albicans*. It is an opportunistic disease that usually develops in compromised patient groups – patients with weakened immunity (cancer patients, HIV-infected, diabetics); people taking antibiotics or corticosteroids; the elderly and infants; dental patients, especially denture wearers [1].

Among the adult population, the prevalence of oral candidiasis ranges from 5% to 7%, but among risk groups this figure can reach 30–40% [2]. In Ukraine, the frequency of oral candidiasis among patients with HIV/AIDS is 25–35% [3].

Despite the availability of synthetic antifungal agents (nystatin, fluconazole), *C. albicans* demonstrates increasing resistance to many drugs. Therefore, the search and study of medicinal plants and plant raw materials with possible antifungal properties is a promising direction of modern medicine and pharmacy.

Purpose of the work: study of the antifungal activity of a medicinal collection consisting of *Origanum vulgare*, *Juglans regia*, *Calendula officinalis*, *Hypericum perforatum*

Materials and methods. To study the antifungal activity, aqueous and aqueous-alcoholic extracts of the studied plants were selected – *Origanum vulgare*, *Juglans regia*, *Calendula officinalis* and *Hypericum perforatum*.

All extracts were tested for their antifungal activity against *C.albicans* (ATCC 10231) by conducting a disk diffusion test. The disk diffusion test was performed as follows. Test discs (diameter 6 mm) were impregnated with 1 mg of each test substance by transferring 20 μ l of solution (5 mg per 100 μ l of solvent). The test discs were kept for 24 hours for solvent evaporation. As a negative control, test discs impregnated with the same amount of the appropriate solvent were used, as a positive control - fluconazole.

Separately, Petri dishes with the appropriate nutrient medium (Sabouraud agar) and fungal inoculum were prepared. After subculture of fungi into Petri dishes, the impregnated test discs were applied to agar. Then they were incubated for 48 hours at a temperature of 37 °C in an incubator. The degree of sensitivity of microorganisms was assessed by the size of the growth inhibition zones. The microbial load was 10^7 microbial cells per 1 ml of medium and was determined by measuring the optical density of the bacterial inoculum [4]. The number of repetitions was 3 times.

Results. The diameters of the growth inhibition zones from 12 mm indicate the sensitivity of the microorganism to the studied extracts. The following extracts showed the highest antifungal activity: water-alcoholic extract of *Origanum vulgare* – 16 ± 0 mm, water extract of *Juglans regia* – 16 ± 0 mm and water extract of *Hypericum perforatum* – 15.67 ± 0.58 mm. Quite high activity was demonstrated by: water-alcoholic solution of *Hypericum perforatum* – 13.67 ± 0.58 mm, water-alcoholic solution of *Calendula officinalis* – 12 ± 1 mm and water solution of *Calendula officinalis* – 11.67 ± 0.58 mm. The control drug Fluconazole (EtOH+H₂O) had a zone of inhibition of fungal growth of 8.33 ± 0.58 mm, which is lower than the activity of some plant extracts. The solvents EtOH+H₂O and H₂O had the lowest activity, which gave minimal zones of inhibition (6 mm), which confirms the lack of antifungal activity of the solvents themselves.

Most plant extracts (except the aqueous extract of *Origanum vulgare*) are superior to fluconazole in terms of antifungal activity, especially the aqueous extract of *Juglans regia* and the aqueous-alcoholic extract of *Origanum vulgare*, which have a 2 times larger zone of fungal growth inhibition. The aqueous extract of *Hypericum perforatum* also exceeds the activity of fluconazole.

The aqueous-alcoholic extracts of *Origanum vulgare* and *Hypericum perforatum* have higher activity compared to the aqueous extracts. This may be due to better extraction of phenolic compounds and essential oils in an alcoholic solution. For *Juglans regia* and *Hypericum perforatum*, the aqueous extract has higher activity compared to the aqueous-alcoholic one, which is due to better extraction of biologically active substances such as tannins and anthracene derivatives.

Conclusions. The conducted studies indicate that the studied medicinal plants exhibit antifungal activity, and most of them showed significantly higher activity than Fluconazole, which indicates their potential as natural antifungal agents. The type of solvent affects the activity of the extract.

Thus, the studied collection, which includes *Origanum vulgare*, *Juglans regia*, *Calendula officinalis* and *Hypericum perforatum*, exhibits pronounced antifungal activity and can be used in the treatment of candidal stomatitis.

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УДК 615.322:616.857-002

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ФАРМАКОГНОСТИЧНИЙ АНАЛІЗ ЛІКАРСЬКОГО ЗБОРУ ДЛЯ ПРОФІЛАКТИКИ ТА ЛІКУВАННЯ МІГРЕНОЗНОГО ГОЛОВНОГО БОЛЮ

Мігрень є поширеним неврологічним захворюванням, що супроводжується інтенсивним головним болем, фоточутливістю, нудотою та іншими неврологічними симптомами. З кожним роком поширеність мігрені зростає, що підтверджують дані Global Burden of Diseases 2019 – станом на 2019 рік у світі налічується 1,1 мільярд пацієнтів, що страждають на мігрень [1].