

# EFFECTIVENESS OF THYME ESSENTIAL OIL IN THE TREATMENT OF RECURRENT VULVOVAGINAL INFECTIONS

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**Abstract.** The study of acute toxicity of vaginal dosage forms with thyme essential oil (suppositories on a polyethylene oxide base and 5% cream on an emulsion base) revealed their harmlessness (hazard class IV). It was established that a single use of vaginal dosage forms with thyme essential oil does not cause visible changes in the main physiological processes and does not affect the functions of vital organs. Comparative microbiological studies have established high antimycotic and antibacterial activity of vaginal dosage forms of thyme essential oil, surpassing that of modern antifungal drugs - ointments and vaginal suppositories.

**Keywords:** thyme essential oil, urogenital mycoses, harmlessness, antimicrobial activity.

## INTRODUCTION

The problem of prevention and treatment of infectious lesions of the genitourinary organs in women has become especially urgent in recent years due to the global nature of their distribution, a wide range of clinical and epidemiological manifestations, numerous complications that lead to disruption of the reproductive function of women and pathology of newborns [1]. At the same time, microbial invasions associated with mycotic lesions have a significant share among these pathologies. The increase in their number in the overall structure of this group of diseases is due to the significant prevalence among the world's population of patients with immunodeficiency pathologies, endocrinopathies with pathology of the gastrointestinal tract and secondary vitamin deficiency, the widespread use of corticosteroid and cytostatic drugs, antibiotics, antitrichomonal and contraceptive

agents, and an increase in the number of people abusing alcohol and drugs. Therapy of mycoses is associated with problems of allergic diseases, viral and bacterial infections, occupational pathologies, infertility, carcinogenesis, and transplant surgery [2].

## **MATERIALS AND METHODS**

A study of acute toxicity of soft dosage forms for vaginal use with thyme essential oil was conducted. The experiment involved 18 rats weighing 180–220 g, divided into three groups. The animals had skin areas on their backs clipped off: 2×2 cm in the first group, 4×4 cm in the second, and 8×8 cm in the third. Vaginal cream with thyme essential oil was applied to the clipped skin areas of the animals in the corresponding groups once at doses of 3000 mg/kg, 6000 mg/kg, and 12000 mg/kg. The animals were observed for 48 hours, recording the probability of animal death, changes in the cardiovascular system, respiratory system, central nervous system, and motor activity. The study of the acute toxicity of vaginal suppositories with thyme essential oil was carried out similarly by applying suppository masses with a temperature of 35–36°C to the trimmed areas of the skin of animals [3].

## **RESULTS AND DISCUSSION**

As a result of studying the harmlessness of vaginal dosage forms of thyme essential oil, it was found that their cutaneous application does not lead to the death of laboratory animals. A single oral administration of cream and suppository mass on a hydrophilic base with thyme essential oil to laboratory rats also does not cause death. The obtained results allow us to state that the developed vaginal dosage forms with thyme essential oil in accordance with the classification of harmful substances. Harmful substances. Classification and general safety requirements" are classified as low-hazard substances. Suppositories with thyme essential oil on a polyethylene oxide base have pronounced antibacterial and antimycotic activity. The carrier base does not have antimicrobial activity. The antifungal activity of the studied vaginal suppositories exceeds that of the vaginal suppositories "Betadine" by 1.2 times, antibacterial activity against the Escherichia

coli strain - by 1.7 times. In relation to the other studied strains of pathogenic microorganisms, the antibacterial activity of vaginal suppositories with thyme essential oil and the reference drug does not differ. Vaginal cream with 5% thyme essential oil on an emulsion base also has pronounced antibacterial and antimycotic activity. The emulsion base-carrier does not have antimicrobial activity. The antifungal activity of the vaginal cream under study exceeds that of Betadine ointment (EGIS, Hungary) by 1.8 times, antibacterial activity against the Escherichia coli strain by 2.1 times, and against the Pseudomonas aeruginosa strain by 1.8 times. With respect to the other studied strains of pathogenic microorganisms, the antibacterial activity of the vaginal cream with thyme essential oil and the reference drug does not differ.

### **CONCLUSION**

1. A study of the acute toxicity of vaginal dosage forms with thyme essential oil (suppositories on a polyethylene oxide base and 5% cream on an emulsion base) revealed their harmlessness (hazard class IV).

2. It was found that a single use of vaginal dosage forms with thyme essential oil does not cause visible changes in the main physiological processes and does not affect the functions of vital organs.

3. Comparative microbiological studies have established that the antifungal activity of vaginal cream and suppositories with thyme essential oil exceeds that of modern antifungal drugs - ointment and vaginal suppositories "Betadine" ("EGIS", Hungary) by 2.1 and 1.2 times, respectively. 4. Suppositories with thyme essential oil are 1.7 times greater than Betadine vaginal suppositories in terms of the size of Escherichia coli growth inhibition zones, and vaginal cream with 5% thyme essential oil is 2.1 times greater than Betadine ointment in terms of Escherichia coli strain and 1.8 times greater than Betadine ointment in terms of Pseudomonas aeruginosa strain.

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