

# STUDY OF PHYSICAL AND CHEMICAL PROPERTIES OF EXTEMPORAL OINTMENT WITH ESSENTIAL OILS

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**Introduction.** Respiratory tract infections are among the most important human health problems because of their high incidence and consequent economic costs.

On average, adults get 4 to 6 colds per year, while children get 6 to 8 of them. Colds cause about 500 FP visits per 1000 patients per year.<sup>1</sup> Because colds occur all year round, the total burden of illness caused by them is greater than the burden caused by seasonal influenza. Colds account for 40% of all time lost from jobs and 30% of all absenteeism from school.<sup>2</sup> There are more than 200 viruses, continuously changing, that are associated with the common cold. Colds occur all year round but are more common in the winter months.

Usually the infection starts in the nasal cavity mucosa (the typical common cold), but it might start in the throat, the sinuses, the ears, or the bronchi, in which case the first symptom could be a sore throat, pain in the facial bones, earache, or cough.

In the complex therapy of acute respiratory diseases, topical preparations are widely used: solutions for external use, gels and ointments containing components of plant origin.

Significant growth of phytopreparations is noted in the group of drugs that affect the respiratory system. Among them should be combined anti-cold ointments, which are in great demand among consumers of pharmacies. Application of ointments containing essential oils of plants is one of the most effective methods of prevention and treatment of acute respiratory diseases.

Camphor and its essential oil also improves blood circulation and metabolism; prevents bacterial and fungal infections of the skin; relieves spasms and cramp pain; reduces inflammation and the pain caused by it. Eucalyptus oil in ointment uses antibacterial, decongestant, analgesic and anti-inflammatory properties.

Eucalyptus works as an expectorant and helps cleanse your body of toxins and harmful microorganisms that can make you feel sick. Eucalyptus essential oil is highly effective for treating respiratory problems, such as asthma, bronchitis, COPD, pneumonia and even tuberculosis. Using eucalyptus for asthma is a proven treatment that dilates the blood vessels and allows more oxygen into the lungs.

Thymol, which are part of the ointment, have antibacterial, antifungal and anti-inflammatory effects.

Chamomile essential oil can be attributed to its properties as an antispasmodic, antiseptic, antibiotic, substance. Moreover, it is a cicatrizant, emmenagogue, analgesic, febrifuge, hepatic, sedative, nervine, digestive, tonic, antispasmodic, bactericidal, sudorific, stomachic, anti-inflammatory, anti-infectious, vermifuge, and a vulnerary substance.

The **aim** of our study was to develop the composition and technology of extemporal ointment for the treatment of acute respiratory diseases

**Materials and methods.** In developing the composition of the extemporal ointment for the treatment of acute respiratory diseases, the following active pharmaceutical ingredients were used: camphor, thymol, turpentine, chamomile oil, petrolatum, anhydrous lanolin. Research methods: study of the rheological parameters of the ointment.

**Results and discussion.** Investigation of the structural-mechanical (rheological) properties of model carrier samples was carried out using a rotational viscosimeter "Reotest-2" (Germany) with coaxial cylinders. To construct the complete rheogram of the flow, the tangential stress in the shear range of 1.5-1332 s<sup>-1</sup> was calculated for all the samples under study at a temperature of (20 ± 2 ° C), and also in the shear rate range of 125-275 s<sup>-1</sup>: temperature (36 ± 2 ° C) (body surface temperature) to assess their ability to spread. It has been established that the gradient of the dynamic viscosity variation of the ointment under study at deformation rates close to zero in the temperature range 10-50 ° C tends to decrease. The compositions have a viscous consistency at high yield stresses.

**Conclusions.** The studied rheological parameters of the ointment composition are quite stable in time, which will ensure a good quality of the preparation during long-term storage.