

## SUBSTANTIATION OF THE COMPOSITION OF ANTI-BACTERIAL SOAP WITH A COMPLEX OF ESSENTIAL OILS

*Semchenko Kateryna, El Amrani Houda*

**National University of Pharmacy, Kharkiv, Ukraine**

**Introduction.** In modern conditions of the spread of respiratory diseases, hand hygiene requires a responsible approach from both medical and pharmacy workers and patients. Compared to ordinary soap, antibacterial soap has many advantages as a reliable barrier to the entry of pathogens of viral and infectious diseases.

**The aim of the study.** The aim of our work is to develop an antibacterial soap based on ingredients of natural origin, where the active pharmaceutical ingredients are a mixture of essential oils of cedar, chamomile, and orange.

**Methods of research.** The research used methods of analysis and generalization of scientific literature data.

**Main results.** Cedar oil is a unique essence that has been used by people since ancient Egypt. Cedar is mentioned in ancient manuscripts, where it is called a symbol of abundance and fertility. There is talk about a wonderful tree in the Old Testament. Noah's ark was built from gopher (that's what cedar was called in ancient times). The wood was used for making sarcophagi, building palaces and temples.

Like all representatives of the Conifer family, cedar essential oil has powerful antiseptic and antiviral properties. The properties of cedar essential oil and its use depend on the chemical composition of the substance. Researchers single out a large group of alcohols of the class of terpenes (cedrol), turpentine hydrocarbons (cadinene); trace elements and vitamins (more of them are contained in nut oil, but they are also present in essential oil).

Cedar essential oil has an effective anti-inflammatory, hormone-regulating, diuretic, analgesic effect, eliminates tremors and nervous tremors, promotes quick and effective wound healing and skin recovery after injuries, improves blood circulation and increases work capacity.

Nevertheless, this essential oil has certain application features. When applied directly to the skin, cedar essential oil usually causes a mild burning sensation. There is practically no allergic reaction of the skin to it, but individual intolerance to the smell may appear a few minutes after application.

Also, it cannot be taken simultaneously with alcohol, during a course of chemotherapy and by pregnant women. Since cedar essential oil stimulates performance and increases activity, it cannot be used in hyperactive states and increased anxiety.

Cedar essential oil acts as a wound-healing and bactericidal agent for the skin. Thanks to the large amount of vitamin E in the composition of the oil, the vitamin of youth, the skin products perfectly remove dryness and peeling, making the skin elastic and shiny. Small wrinkles will simply disappear after a few applications of the cosmetic product with the miraculous oil of delicious walnut.

When processing literary sources, it was established that the use of cedar essential oil is limited due to its high volatility and poor solubility in water. To solve this problem, the authors prepared two types of oil-in-water cedar essential oil emulsions, including cedar essential oil nanoemulsion (CEO-NE) and cedar pickering

essential oil emulsion (CEO-PE). CEO-NE with 5% surfactant had a smaller particle size ( $135.14 \pm 1.1$  nm) and a higher absolute zeta potential (32.75 mV) compared to CEO-PE (1% starch), whose particle size was  $626.21 \pm 6.05$  nm, zeta potential was 27.58 mV. The stability of CEO-NE and CEO-PE was tested by multiple light scattering, and the results showed that the turbiscan stability index (TSI) value of CEO-NE was much lower than that of CEO-PE. CEO-NE and CEO-PE exhibited higher free radical scavenging activity, iron-reducing power, and antibacterial ability than CEO itself. These results indicate that emulsification is a feasible method to expand the application of CEO.

So, on the basis of the conducted research, it was established that for the further development of soap with an antibacterial effect, it is advisable to use the essential oil of the Atlas or Himalayan cedar, of the therapeutic grade type.

It is known that essential oil of cedar belongs to oils with low volatility. Possible combinations of cedar essential oil with other oils are described in table 1.

Table 1

### Compatibility of essential oil of cedar

Essential oil	Compatibility and volatility of other essential oils	
Cedar essential oil	highly volatile	orange, bergamot, clary sage
	medium volatile	cypress, juniper, chamomile, pine, black pepper
	low volatile	jasmine, ginger

The classic scheme of preparing an aromatic composition involves mixing essential oils with different volatility in equal proportions. In order to strengthen the antibacterial effect of the soap, it is advisable to add essential oils of chamomile and orange to the essential oil of cedar. The combination of selected essential oils will provide a powerful antibacterial effect, as well as have reparative and wound-healing properties.

After processing data from scientific literature and recommendations for the preparation of medical and cosmetic products, we suggest the following composition of soap with an antibacterial effect based on API of natural origin (table 2).

Table 2

### Composition of soap with an antibacterial effect

Ingredient	Quantity, g
Coconut oil	13.5
Olive oil	52.0
Purified water	24 ml
Sodium hydroxide	9.0
Cedar essential oil	0.5
Chamomile essential oil	0.5
Orange essential oil	0.5
Totally:	100.0

**Conclusions.** On the basis of the conducted research composition of soap with an antibacterial effect is based on API of natural origin was substantiated.