

cycle, cholesterol and carbohydrate metabolism, local vascularization, intracellular protein kinases, transcription factors a.o., whilst each of this interlinked processes may be targeted by phytoestrogens. Understanding targets and mechanisms of phytoestrogen action can be important not only from theoretical, but also from practical viewpoints to predict and to avoid the negative side-effects of phytoestrogen application. The second major problem is the discrepancy between the results of experimental studies and the data from clinical trials. This is likely because the phytoestrogens clinical trials have been limited in many aspects including the number of participants enrolled, the clinical end points investigated, and the lack of long-term follow-up. The third problem is to find an adequate source of phytoestrogens for practical application. The majority of reported studies are focused on soy and red clover isoflavones. Other perspective phytoestrogens and plants (for example, the molecules of flaxseed origin) are studied much less despite their high therapeutic potential. In addition, the general plant-based approaches are associated with serious disadvantages: the production, isolation and application of plant phytoestrogens are time- and labour-consuming, whilst their specificity and reproducibility are sometimes insufficient. Phytoestrogen spectrum and content varies between the plant species, sort and origin, and even the same molecule arising from the different sources can exert various effect. It may not be excluded, that synthetic phytoestrogens with desirable structure and activity could be easier and safer alternative of the traditional plant product of variable origin, phytoestrogen content and activity.

### **Phytochemical study of the herba of *Cardaria draba* L.**

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**Introductions.** An topical problem of modern pharmacy is the expansion of the nomenclature of herbal medicinal raw materials, the sources of which are plants of the domestic flora, as well as those that are cultivated. Medicinal plant raw materials have advantages over synthetic analogues: the absence or small number of side effects, a diverse range of therapeutic effects.

*Cardaria draba* is a species of plant from the genus *Cardaria* of the family *Brassicaceae*. The range covers southern Europe, the Mediterranean, Iran, North Africa, Western and Central Asia; in Northern Asia and North and South America, Australia, South Africa it is found as drifting. In Russia, it is widespread in the middle and southern regions of the European part, Crimea, the Caucasus, and southern Siberia. The tap root is long, strong; lateral roots are horizontal, branched; the root system deepens up to 6 m. The stem is straight, branched, short pubescent, 20-50 cm high. The leaves are alternate, from salad-green to gray-green due to the pressed short simple pubescence. The lower ones are petioled, whole, lyre-shaped or notched, with a wedge-shaped base, usually drying by the time of flowering; Stems and upper ones are sessile with a heart-shaped or slightly arrow-shaped base, oblong-ovate, often toothed and notched. Inflorescence on the top of the stem, thyroid, branched, with 2-4 lateral brushes. The flowers are small, 4-6(8) mm in diameter, fragrant, white, with petals up to 3 mm long. Sepals are bare, half as short as the petals, with a wide membranous margin. The fruit is a heart-shaped-oval, flattened, non-opening, double-nested, light yellow or yellowish-grey pod, 3-4 mm long and 3.5-5 mm wide, glabrous, with leathery flaps and a long column. The seeds are ovoid or obverse-ovoid, with a faintly

noticeable wide root along the edge, which is slightly shorter than the cotyledons; The seeds are 1,5-1,75 mm long and 1-1,25 mm wide, 0,75 mm thick. The surface of the seeds is small-bumpy, matte, dark brown or cherry-red, the scar is black with the remains of whitish films. Raw materials contain biologically active substances: ascorbic acid, dehydroascorbic acid and carotenes, essential oils and phenolic compounds, organic acids, were determined hexadecanoic acid, phytol, dibutyl phthalate. Plants of the *Cardaria* genus are widely used in folk medicine. Raw material of this plant is used as antibacterial, antiinflammatory, antimicrobial and antiscab activity.

**The aim of the study.** Preliminary study of the chemical composition of herba of *Cardaria draba* L.

**Materials and methods.** Raw herba of *Cardaria draba* were harvested in May 2022 from cultivated specimens. Preliminary study of the chemical composition was performed using pharmacognostic methods of analysis (in vitro reactions, chromatography on paper and in a thin layer of sorbent).

**Results and their discussion.** Preliminary studies of the chemical composition of the herba of *Cardaria draba* showed the presence of free and bound phenolic compounds, including flavonoids, tannins and hydroxycinnamic acids, carbohydrates and amino acids.

**Conclusions.** Based on this, it is established optimal timing of harvesting the aboveground part of herba of *Cardaria draba*. The data obtained will be used in further study of herba of *Cardaria draba*.

As promising source of raw materials for the creation of drugs for it basis. The obtained results confirm the prospects for further pharmacognostic study of the raw materials of this plant.

## **Antibacterial Activity of Commercial Geranium Essential Oil Against Some Gram-Positive and Gram-Negative Bacteria**

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**Introduction.** Antibiotics have paved the way for today's modern medicine. The mid-20th century was even named the "antibiotic era". Infectious diseases were believed to be eradicated by the end of the last century. Similarly, antibiotics have been fundamental for successful invasive and high-end surgeries including organ transplantation, and immunomodulatory treatments in rheumatology, oncology, and many other medical disciplines (Ventola, 2015). The availability of antibiotic therapy has significantly reduced mortality in children resulting in increased life expectancy in general (Adedeji, 2016). Nevertheless, increasing numbers of bacteria are becoming resistant to multiple antibiotics currently in use resulting in multidrug-resistant (MDR) bacteria (Tanwar et al., 2014). Presently, the increasing resistance of microorganisms to currently used antimicrobials in combination with the appearance of emerging diseases requires the urgent development of new, more effective drugs (Sakkas and Papadopoulou, 2017). Plants have been used for a wide variety of purposes due to the large biological and structural diversity of their components, which constitute a unique and renewable source for the discovery of new antibacterial, antifungal, and antiparasitic compounds (Sakkas and Papadopoulou, 2017).

Herbs and the essential oils derived from them have been used from the beginning of human history for different purposes (Solórzano-Santos and Miranda-Navales, 2012; Rodriguez-Garcia et al., 2016). Their beneficial properties have been applied to mask unpleasant odors, attract the attention of other people,