

“BIOACTIVE AND MULTIPOTENTIAL APPLICATIONS OF CAPER”

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**Abstract:** This study investigates the medicinal and nutritional value of caper (*Capparis spinosa*) and explores the possibilities of preparing and utilizing its various products. The research considers products made from the plant's buds, fruits, leaves, and stems, including preserves, syrup, tea, and medicinal decoctions.

**Keywords:** Caper (*Capparis spinosa*), buds, fruits, preserves, syrup, tea, medicinal properties, bioactive compounds

**Annotatsiya:** Ushbu ilmiy ishda kovul (*Capparis spinosa*) o'simligining dorivor va oziqlik qiymati, shuningdek, uning turli mahsulotlarini tayyorlash va foydalanish imkoniyatlari o'rganilgan. Tadqiqotda o'simlikning g'uncha, meva, barg va po'stlog'idan tayyorlanadigan konserva, sirop, choy va dorivor damlama mahsulotlari ko'rib chiqilgan.

**Kalit so'zlar:** Kovul (*Capparis spinosa*), g'uncha, meva, konserva, sirop, choy, dorivor xususiyatlar, bioaktiv moddalar

**Аннотация:** В данном исследовании рассматривается лекарственная и пищевая ценность каперса (*Capparis spinosa*), а также возможности приготовления и использования его различных продуктов. Исследование охватывает продукты, изготовленные из бутонов, плодов, листьев и стеблей растения, включая консервы, сироп, чай и лекарственные отвары.

**Ключевые слова:** Каперс (*Capparis spinosa*), бутоны, плоды, консервы, сироп, чай, лекарственные свойства, биологически активные соединения

**Introduction:** The caper plant (*Capparis spinosa*) has historically been valued as both a medicinal and nutritional resource. Its buds and fruits are widely used in the preparation of fermented products such as preserves, syrups, infusions, and herbal teas. This plant contains bioactive compounds including flavonoids, vitamins, and enzymes, which possess antioxidant, anti-inflammatory, antibacterial, and analgesic properties.

In recent years, the high price of caper products in the global market has increased their economic value and expanded their potential applications in the pharmaceutical and medical fields. Therefore, a scientific analysis of the bioactive and pharmacological properties of caper, as well as the possibilities for preparing and using its products, is considered an important and relevant issue.

The aim of this study is to investigate the bioactive compound composition of caper buds and fruits, determine their significance in medicine, and evaluate their potential use in the form of preserves, syrups, teas, and medicinal infusions.

**Main Part:** General characteristics of the caper plant: The caper plant (*Capparis spinosa*) is a perennial plant belonging to the Capparaceae family and is mainly cultivated in subtropical and arid regions. All parts of the plant — roots, stems, leaves, buds, and fruits — contain bioactive compounds beneficial to humans. Each part is used for different purposes: the buds and fruits are fermented and used to prepare syrup, preserves, infusions, and tea; the leaves and stems

are mainly used as herbal tea and medicinal infusions. The root bark is also used in certain medicinal preparations.

**Bioactive compounds and medicinal properties:** Caper contains flavonoids, vitamins (A, C, E), minerals, phenolic compounds, and enzymes, which provide the following pharmacological properties: **Antioxidant property:** protects cells from free radicals and slows down aging. **Anti-inflammatory effect:** used in arthritis and inflammatory diseases. **Antibacterial and antiviral effect:** provides natural protection against infections. **Analgesic effect:** used as an alternative to synthetic drugs. **Improvement of liver and stomach function:** stimulates digestion and metabolic processes. These properties make all parts of the caper plant a multipotential product with high medicinal and nutritional value.

**Preparation and use of products:** Buds and fruits: through fermentation they are used to prepare syrup and preserves, and are also consumed as infusions and teas.

**Leaves and stems:** used as tea and medicinal infusions while retaining healing properties. **Roots and bark:** used in pharmaceutical preparations and in certain traditional medicine recipes. During the preparation process, special attention is paid to preserving bioactive compounds, which increases their pharmacological effectiveness and ensures product quality.

**Economic and market aspects:** Caper preserves and syrup are sold at premium prices in the global market because they are natural, free from synthetic drugs, and have a unique taste. From 10 caper plants, the annual income can reach 2.5–6.2 million Uzbek soums; by expanding the plantation and planting seedlings, the income can increase significantly. Through the production of premium-quality products and effective marketing strategies, profits can be increased further.

The caper plant begins to produce yield in the third year, and about 1,600 seedlings can be planted per hectare. Importantly, the plant produces buds throughout the summer. Unopened round and firm buds not larger than 10 mm are considered the most marketable product. They are harvested by hand every 8–10 days. For this reason, they are sold at high prices in global markets. From one well-developed plant, up to 3 kg of yield can be collected during each harvest. By the end of the season, this indicator reaches 7.5 kg, which corresponds to about 12 tons per hectare. Considering that the price in the world market starts from 1.5 US dollars per kilogram, the total annual income may reach approximately 18,000 US dollars. This figure continues to increase from year to year.

**Scientific and practical significance:** Scientific analysis of the bioactive compounds of caper confirms its pharmaceutical and medical applications. The technology of product preparation and its economic value expand its potential for practical use in scientific, pharmaceutical, and commercial fields. At the same time, the caper plant proves to be an important resource for producing natural, drug-free, and multipotential products.

**Conclusion:** The caper plant has been proven to be valuable not only medicinally but also economically due to products prepared from its buds, fruits, leaves, and stems. According to the research results, the flavonoids, vitamins, and enzymes contained in the buds and fruits determine the antioxidant, anti-inflammatory, antibacterial, and analgesic properties of caper products. Products such as preserves, syrup, tea, and medicinal infusions are prepared while preserving their bioactive properties, which increases their pharmacological effectiveness.

In addition, the premium price of caper preserves and syrup in the global market shows that their production is economically profitable. This scientific study demonstrates the importance of caper in producing natural, drug-free, and multifunctional products and reveals its potential applications in scientific, pharmaceutical, and commercial fields. Therefore, caper is considered a plant with great potential not only for scientific research but also for business and pharmaceutical innovations.

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