

Biomorphology and scientifically based Beneficial Properties of the *Chelidonium Majus* L.

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ABSTRACT

The poppy family includes 45 genera and more than 200 species, and is distributed in temperate and subtropical climate zones. Most plants of the poppy family, including the *Chelidonium majus* L. species, contain milky juice (latex). The soporific poppy, which is included in the family, has been widely cultivated in culture since ancient times. It contains a large amount of alkaloids. Other poppy species are also used as ornamental plants. One of the most valuable species of the family is the great celandine or ziliot. There are 3 species of this plant in the world's flora. Only one species of this genus - *Chelidonium majus* L. is found in Azerbaijan.

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INTRODUCTION

Chelidonium majus L. is a perennial medicinal plant belonging to the *Papaveraceae* Juss. (poppy) family. It is widely distributed in Europe, Asia and North America and has been used in traditional folk medicine for various purposes since ancient times. The plant contains a rich chemical complex that characterizes its pharmacological and biological effects - a large number of substances belonging to the *isoquinoline* group of alkaloids [1, p. 133]

I. Biomorphological characteristics:

1. Systematic Structure:

- Scientific Name: *Chelidonium majus* L.
- Family: *Papaveraceae* Juss.

2. Morphological description

3. Plant structure and form: *Chelidonium majus* L. is a perennial herb. It can generally reach a height of 30-120 cm. The stem of the plant is stalk-like, succulent and not covered with bark.

Root system: The plant is characterized by an extensive rhizome-like root system, which serves for the effective distribution of water and nutrients.

Leaves: The leaves are pinnate and entire. The surface of the leaves is green, soft, and rich in channels that secrete latex (milky sap).

Flowers: Yellow, usually four-petaled flowers bloom from May to September.

Latex: All parts of the plant contain latex (an orange-yellow milky sap), which contains biologically active substances.

3. Seeds and distribution: The seeds of the *Chelidonium majus* L. are black and oily and are spread by insects.

4. Natural distribution and habitat: The plant is found in old gardens, wastelands, roadsides, and places with well-aerated soil. It is generally nitrophilic and alkaphilic [2, p. 98].

II. Phytochemical composition:

The chemical composition of *Chelidonium majus* L. is very complex and rich in phytochemically active compounds. The main components are as follows:

1. Isoquinoline alkaloids

The main active substances of the plant are **isoquinoline alkaloids**:

- *Chelidonine*
- *Sanguinarine*
- *Chelerythrine*
- *Berberine*
- *Coptisine*
- *Protopine*

These alkaloids are the basis for the various pharmacological effects of the plant and are highlighted as biologically active components in most scientific studies [3, p. 282-283].

2. Other active substances

The plant also contains *flavonoids, phenolic acids, sterols, carotenoids and other phytochemicals*. These substances have antioxidant and immunomodulatory effects.

III. Beneficial properties

Chelidonium majus L. has been used in folk medicine for thousands of years for various purposes, and modern science has also confirmed a number of its effects.

Antimicrobial and antifungal activity:

Plant extracts can have antibacterial activity against Gram-positive bacteria and exhibit antifungal effects against fungi such as *Candida albicans* (C.P. Robin). Studies have shown that the substance chelidonin isolated from the plant has antifungal effects against a number of fungi and may be used as a promising substance in the preparation of industrial-scale preparations for this purpose [5, p. 104-105].

Antioxidant activity

The flavonoid and phenolic compounds in the plant have powerful antioxidant effects. These substances help neutralize free radicals and prevent cell damage [6, p. 248-249].

Antiviral activity

Several scientific sources have shown the antiviral effects of the *Chelidonium majus L.* alkaloids. For example, the inhibitory effects of these extracts against HIV-1, herpesvirus, adenovirus and influenza viruses have been tested.

Antibacterial and Immunomodulatory effects

Isoquinoline alkaloids have antimicrobial effects and are effective against some important pathogens. Extracts of the *Chelidonium majus L.* can regulate the levels of pro-inflammatory cytokines by exerting immunomodulatory effects.

Cytotoxic and anticancer activity

Some modern studies show that the plant's alkaloids, especially sanguinarine, can inhibit the growth of some cancer cells by exerting cytotoxic effects. These properties are considered promising in preventing multidrug-resistant cancer cells.

These effects have been confirmed mostly in vitro (in a laboratory environment), and further research are required for clinical confirmation.

IV. Clinical and ethnomedicinal uses

1. Uses in Traditional Medicine

Greater celandine (*Chelidonium majus L.*) has been used for centuries in many cultures for the following purposes:

- Treatment of warts: applied externally to the skin, it has a hygienic effect;
- Digestive system and biliary tract: traditionally used to support bile flow and improve digestive function;
- Ophthalmic applications: traditionally used to cleanse the area around the eyes;
- Respiratory diseases: used for conditions such as bronchitis and coughs.

Use in modern medicine

Modern phytotherapy practices use certain components, such as various herbal preparations. However, their use is limited to the supervision of a qualified physician, as the plant carries risks of toxicity.

MATERIAL AND METHODS

In conducting the research work, the article Greater celandine (*Chelidonium majus L.*) was written using the following methods - analysis, application, and scientific literature.

RESULTS AND DISCUSSION

V. Scientific research and prospects

New scientific research conducted by various scientists is exploring in greater detail the phytochemical composition, alkaloid biosynthesis, and biological activity of the *Chelidonium majus* plant. Bibliometric analyses conducted in recent years have focused on the plant's anticancer, antioxidant, antibacterial, anti-inflammatory, and immunomodulatory activities. At the same time, research by various scientists is aimed at enhancing the bioactivity of plant extracts by integrating them into nanocarriers. This approach

demonstrates the potential for expanding the plant's use in areas such as infection control, treatment of oral inflammation, cosmetics, and food preservation [4, p. 68].

CONCLUSION

Greater celandine (*Chelidonium majus* L.) is a medicinal plant with a unique biomorphological structure. Its alkaloids and phytochemicals exhibit diverse physiological effects, including antimicrobial, antiviral, antioxidant, immunomodulatory, and cytotoxic properties. However, these effects have been confirmed primarily in laboratory settings, and clinical use of the plant requires qualified oversight due to serious safety risks. Current scientific research is aimed at better understanding the plant's biological effects and optimizing potential therapeutic approaches.

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