



BIOLOGICAL AND PHARMACOLOGICAL PROPERTIES OF DANDELION (TARAXACUM OFFICINALE)

Ismailova Dilaram Kurbanbay kizi

**2nd-year student of the Department of Technology of Cultivation and
Processing of Medicinal Plants, Karakalpakstan Institute of
Agriculture and Agrotechnologies**

Abdraimova Kundiz Yuldashovna

**Senior teacher of the Department of Storage of Agricultural Products
and Technology of Loss Prevention and Processing of Medicinal Plants,
Karakalpakstan Institute of Agriculture and Agrotechnologies**

<https://doi.org/10.5281/zenodo.18053949>

ARTICLE INFO

Received: 23rd December 2025

Accepted: 24th December 2025

Online: 25th December 2025

KEYWORDS

*dandelion; medicinal plants;
Taraxacum officinale;
phytotherapy; biochemical
composition; inulin;
hepatoprotective effect; diuretic
property; antioxidants.*

ABSTRACT

This article provides a comprehensive analysis of the biological, biochemical, and pharmacological properties of dandelion (Taraxacum officinale) as a medicinal plant. The study examines biologically active compounds found in the roots, leaves, and flowers of the plant, including inulin, flavonoids, phenolic compounds, vitamins, and minerals, and highlights their importance for human health. In addition, the main medicinal preparations derived from dandelion—such as infusions, decoctions, extracts, capsules, and topical remedies—are described along with their fields of application. The article explains the hepatoprotective, diuretic, digestive, anti-inflammatory, and antioxidant effects of dandelion based on scientific sources.

Introduction. In recent years, interest in medicinal plants as natural alternatives or supplements to synthetic drugs has been steadily increasing. Among such plants, dandelion—scientifically known as *Taraxacum officinale* holds a special place. Although it is widespread and often regarded as a common wild plant, dandelion has been used in folk medicine for centuries. Moreover, due to its rich biochemical composition and diverse pharmacological effects, it has attracted the attention of modern researchers. Therefore, this article aims to provide detailed information on the healing properties of dandelion, the main preparations derived from it, and the diseases in which it is most commonly used.

First of all, dandelion is a perennial herb belonging to the Asteraceae family. It is characterized by a basal rosette of deeply toothed leaves, hollow flower stalks, and bright yellow inflorescences. After flowering, the plant produces spherical seed heads that are easily dispersed by wind. As a result, dandelion grows abundantly in meadows, gardens, roadsides, and cultivated fields. In addition, the plant is highly adaptable to various climatic and soil conditions. Consequently, it is widely distributed in Central Asia, including Uzbekistan, as well as in Europe, Asia, and North America. Importantly, almost all parts of the plant—roots, leaves, stems, and flowers—are used for medicinal purposes, which significantly increases its therapeutic value [5, 313-323].

From a biochemical perspective, dandelion contains a wide range of biologically active substances. Most notably, its roots are rich in inulin, a natural polysaccharide that supports intestinal health and regulates carbohydrate metabolism. In addition, both roots and leaves contain bitter compounds that play a key role in stimulating digestion. Furthermore, dandelion is a valuable source of flavonoids, phenolic acids, terpenoids, and coumarins, which exhibit antioxidant and anti-inflammatory effects. The plant also contains vitamins A, C, and K, as well as minerals such as potassium, calcium, iron, and magnesium. Therefore, the combination of these compounds explains the broad spectrum of dandelion's medicinal effects [1].

One of the most important medicinal properties of dandelion is its hepatoprotective activity. In other words, extracts prepared from its roots stimulate bile secretion and improve liver function. As a result, dandelion has traditionally been used to support liver detoxification and to treat conditions such as sluggish liver function and bile stagnation. In addition, dandelion—especially preparations made from its leaves—exhibits a strong diuretic effect. Unlike many synthetic diuretics, however, it helps eliminate excess fluid without significantly disturbing electrolyte balance. Therefore, it is often recommended for mild edema and minor kidney function disorders.

Moreover, dandelion plays a significant role in improving digestive processes. Due to its bitter compounds, it enhances gastric juice secretion, stimulates appetite, and increases intestinal motility. As a result, it is widely used in cases of indigestion, flatulence, constipation, and reduced appetite. At the same time, the plant demonstrates strong anti-inflammatory and antioxidant properties. These effects are associated with flavonoids and polyphenols, which neutralize free radicals and reduce inflammation. Consequently, dandelion is beneficial in chronic inflammatory conditions and helps protect cells from oxidative damage. In addition, due to its richness in vitamins and minerals, dandelion contributes to strengthening the immune system. Thus, it is often used as a general tonic, especially during seasonal changes or recovery periods after illness.

Regarding medicinal preparations, dandelion can be processed in various forms depending on therapeutic purposes. Most commonly, it is used as herbal tea or infusion. For example, infusions prepared from the leaves are mainly used as diuretics, while decoctions made from the roots are employed in liver and digestive disorders. Furthermore, tinctures and liquid extracts are widely used in both traditional and modern herbal medicine. These preparations are more concentrated and therefore require lower dosages. Additionally, capsules and tablets containing dried or standardized extracts provide a convenient and precise method of administration [4, 301-310].

In some cases, dandelion is also used externally. In particular, ointments, compresses, and lotions prepared from its leaves or flowers are applied to treat skin conditions such as eczema, rashes, and mild inflammations. Moreover, the plant is used in nutrition: young leaves are consumed in fresh salads, while roasted roots serve as a caffeine-free coffee substitute.

Traditionally, dandelion has been used to treat a wide range of diseases. Most importantly, it is applied in liver and gallbladder disorders, including impaired bile secretion and liver dysfunction. In addition, it is widely used in digestive system disorders such as dyspepsia, low-acidity gastritis, and constipation. Since dandelion possesses diuretic properties, it is also beneficial in kidney and urinary tract conditions, as well as in cases associated with fluid

retention. Furthermore, it is used to treat inflammatory conditions, including joint pain and certain skin problems.

In folk medicine, dandelion has also been employed to support metabolic regulation in mild diabetes and obesity. However, despite the widespread use of these applications, it should be emphasized that additional clinical studies are required to fully confirm some of these effects.

Despite its many benefits, dandelion should be used with caution. For instance, individuals allergic to plants of the Asteraceae family may experience adverse reactions. Moreover, people with gallstones or serious liver diseases should consult a healthcare professional before use. Pregnant and breastfeeding women are also advised to seek medical advice prior to taking dandelion-based preparations.

Conclusion. In conclusion, dandelion (*Taraxacum officinale*) is a highly valuable medicinal plant that has been traditionally used for centuries. Due to its hepatoprotective, diuretic, digestive, anti-inflammatory, antioxidant, and immune-supporting properties, it plays an important role in herbal medicine. In addition, the availability of various preparations—such as teas, decoctions, infusions, capsules, and topical applications—makes dandelion both versatile and convenient. Therefore, when used correctly and responsibly, this plant can make a significant contribution to the prevention and treatment of many diseases.

References:

1. Bown, D. (1995). The Royal Horticultural Society encyclopedia of herbs & their uses (pp. 424-pp).
2. Chevallier, A. (2016). Encyclopedia of herbal medicine: 550 herbs and remedies for common ailments. Penguin.
3. Herrera Vielma, F., Quiñones San Martín, M., Muñoz-Carrasco, N., Berrocal-Navarrete, F., González, D. R., & Zúñiga-Hernández, J. (2025). The Role of Dandelion (*Taraxacum officinale*) in Liver Health and Hepatoprotective Properties. *Pharmaceuticals*, 18(7), 990.
4. Hu, C., & Kitts, D. D. (2003). Antioxidant, prooxidant, and cytotoxic activities of solvent-fractionated dandelion (*Taraxacum officinale*) flower extracts in vitro. *Journal of agricultural and food chemistry*, 51(1), 301-310.
5. Schütz, K., Carle, R., & Schieber, A. (2006). *Taraxacum*—a review on its phytochemical and pharmacological profile. *Journal of ethnopharmacology*, 107(3), 313-323.