

The Longwood Herbal Task Force
(<http://www.mcp.edu/herbal/default.htm>) and
The Center for Holistic Pediatric Education and Research
(<http://www.childrenshospital.org/holistic/>)

Dandelion (*Taraxacum officinalis*)

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Principal Proposed Uses: Diuretic, liver tonic

Other Proposed Uses: Salad green, weight loss remedy

Overview

The major modern and historical uses for dandelion are as a diuretic and liver tonic. Both uses are supported by animal data. Although there is long historical tradition to support these uses, no randomized, controlled trials in humans have evaluated dandelion's effect as a diuretic, cholagogue, appetite stimulant, hepatitis remedy or weight loss agent. Aside from gardener's laments and allergic reactions, dandelion is very safe. It is widely consumed as a salad green; the roots are roasted and used as a coffee substitute. There are no studies specifically evaluating its safety during pregnancy, lactation or childhood.

Historical and Popular Uses

“The difference between an herb and a weed is judgment.” – old gardener's saying

Dandelion has long been used medicinally as a diuretic. Its French name, “pissenlit”, means “to wet the bed.” Arab physicians of the 10th century relied on dandelion as a liver tonic, laxative and diuretic. In the Middle Ages, European physicians continued to use the leaves and roots of the yellow-flowering plant to treat diseases of the yellow bile (liver and gall bladder) and as a diuretic¹. The folk medicines of China, India and Russia have recognized dandelion's effects as a liver tonic. Traditional Chinese Medicine combines dandelion with other herbs to treat hepatitis, to enhance the immune response to upper respiratory tract infections, bronchitis

and pneumonia, and as a topical compress to treat mastitis. As recently as 1957, more than 20 tons of dandelion leaves were imported into the US annually for medicinal purposes².

Dandelion was included as a diuretic in the US pharmacopeia from 1831 to 1926³. Based on its diuretic effects, dandelion is often included in herbal weight loss and premenstrual syndrome remedies. Some herbalists also recommend it as a way to help prevent atherosclerosis⁴. Others suggest it may be a useful spring and fall tonic for patients with chronic osteoarthritis and those with a tendency to form gallstones⁵.

In addition to its medicinal uses, dandelion serves as a salad green in the gourmet's garden and as an unwelcome weed in the well-manicured lawn. The leaves are an excellent source of vitamin A. The ground roots are sometimes used as a substitute for chicory roots or coffee beans. The flowers are sometimes fermented into wine. The root is the part most often used medicinally². The German Commission E approves it for use as a diuretic and to treat dyspepsia, liver and gallbladder complaints and appetite loss^{6, 7}.

Botany

Medicinal species: Taraxacum officinalis aka *Leontodon taraxacum* (roots are *Radix taraxaci*; leaves are *Herba taraxaci*). Europeans have developed over 100 specialized varieties for salads, cooking, wine, and as a coffee substitute.

Common names: Blowball, canker wart, fairy clock, lion's tooth, piss-in-bed, white endive, wild endive; Lowenzahnwurzel (Ger); pissenlit (Fr); pu gong ying (Ch)^{3, 8}

Botanical family: Compositae, sub-family Cichoroideae (chicory)

Plant description: Dandelion is known as a self-sowing, variable perennial – also known as a weed. The dentate leaves grow close to the ground in a rosette around the hollow stem. The tap root extends several inches into the ground. The yellow flowers are sensitive to light, opening in bright sunlight and closing during dark and dreary days; they bloom throughout the summer and becomes “fuzzball”, full of feathery seeds.

Where it's grown: Dandelion was originally native to Europe and Asia, but made a successful transition across the Atlantic ocean; it now grows amazingly well in yards, gardens, fields, roadsides, open meadows and waste ground.

Biochemistry

Dandelion: Potentially Active Chemical Constituents

- Sesquiterpene lactones (bitters): taraxinic acid (taraxacin), tetrahydroridentin B
- Triterpenoids and sterols: taraxasterol, taraxerol, cycloartenol, beta-sitosterol
- Other: Vitamin A, Vitamin C, tannins, alkaloids, pectin, inulin, starch, potassium, beta carotene, caffeic acid, flavonoids (apigenin)

Dandelion's active ingredients are found in both the roots and leaves. The leaves contain bitter *sesquiterpene lactones* such as taraxinic acid and *triterpenoids* such as cycloartenol. The roots contain these compounds as well as phenolic acids and inulin^{9, 10}. Potassium is present in the leaves at 297 mg per 100 grams of leaves¹¹. The leaves also contain substantial amounts of Vitamin A (14,000 units per 100 grams of leaves, compared with 11,000 units per 100 grams of carrots)¹¹.

The sesquiterpene lactones found in both leaves and root have demonstrated diuretic effects¹². They also stimulate bile flow from the liver.

Different compounds may be present in different products depending on extraction methods. For example, the alcoholic extracts stimulate bile excretion whereas the aqueous extracts have no such effects.

Experimental Studies

Dandelion: Potential Clinical Benefits

1. Cardiovascular: none
2. Pulmonary: none
3. Renal and electrolyte balance: Diuretic
4. Gastrointestinal/hepatic: Cholagogue, digestive aid and appetite stimulant, laxative, hepatitis
5. Neuro-psychiatric: none
6. Endocrine: Diabetes
7. Hematologic: none
8. Rheumatologic: none
9. Reproductive: none
10. Immune modulation: Immunostimulant
11. Antimicrobial: Antiviral
12. Antineoplastic: Antitumor
13. Antioxidant: none
14. Skin and mucus membranes: Wart remedy
15. Other/miscellaneous: none

1. **Cardiovascular:** none
2. **Pulmonary:** none
3. **Renal and electrolyte balance:** Diuretic
 - i. *In vitro data:* none
 - ii. *Animal data:* In rats and mice, dandelion leaf extracts had diuretic effects as potent as furosemide¹². It has greater diuretic effects than other herbs such as equisetum and juniper berry^{11, 13}. The diuretic effect accounted for 100% of the weight loss found in these animal studies.
 - iii. *Human data:* There are no studies evaluating the diuretic effects of dandelion leaves or roots in humans or comparing it to standard diuretic medications.

4. **Gastrointestinal/hepatic:** Cholagogue, digestive aid and appetite stimulant, laxative, treatment of hepatitis B
- a. Cholagogue: Dandelion has long been used to stimulate bile secretion¹⁴.
 - i. *In vitro data*: none
 - ii. *Animal data*: In German studies, dandelion leaf extracts increased bile secretion by 40% in rats¹⁵. In French studies, giving dogs a decoction of fresh dandelion root doubled their bile output¹⁶.
 - iii. *Human data*: There are no studies in humans evaluating dandelion's effect on bile production or excretion.
 - c. Digestive aid and appetite stimulant: Historically, plants with strong bitter flavors have been regarded as digestion and appetite enhancers.
 - i. *In vitro data*: none
 - ii. *Animal data*: In two Chinese studies of animals with gastric ulcers, gastric metaplasia and hyperplasia, dandelion-containing herbal combinations led to significant histologic improvement (based on English abstracts)^{17, 18}.
 - iii. *Human data*: none
 - d. Laxative: Dandelion's historical use as a gentle laxative has not been thoroughly evaluated in modern studies¹⁹. In a case series of 24 adults suffering from chronic colitis, an herbal combination containing dandelion improved constipation, diarrhea and intestinal cramping in 96% of patients²⁰.
 - e. Treatment of hepatitis B: The Chinese have relied on an herbal combination including dandelion in the treatment of hepatitis B infections. A Chinese case series reported that an herbal combination including dandelion was helpful in treating 96 adults with chronic hepatitis B infection²¹. There are no *in vitro* or animal data to evaluate this use.
5. **Neuropsychiatric:** none
6. **Endocrine:** Diabetes: Dandelion is a traditional European remedy for Type II diabetes.
 - i. *In vitro data*: none
 - ii. *Animal data*: Dandelion roots in doses of 500 mg per kg body weight exerted moderate hypoglycemic effects in normal rabbits, but not those with experimentally induced

diabetes²². In both normal mice and those with experimentally-induced diabetes, dandelion extracts exerted no significant effect on blood sugar levels²³.

iii. *Human data*: There are no studies evaluating the effects of dandelion preparations on blood sugar levels in normal or diabetic humans.

7. **Hematologic**: none

8. **Rheumatologic**: none

9. **Reproductive**: none

10. **Immune modulation**: Immunostimulant

i. *In vitro data*: none

ii. *Animal data*: In Chinese studies of mice with immunosuppression secondary to scald burns, dandelion and five other herbs enhanced several measures of immune functioning²⁴.

iii. *Human data*: none

11. **Antimicrobial**: Antiviral

i. *In vitro data*: Like many herbal extracts, dandelion demonstrated antiviral effects against human herpes virus, type 1 (HHV1) *in vitro*²⁵.

ii. *Animal data*: none

iii. *Human data*: none

12. **Antineoplastic**: Antitumor

i. *In vitro data*: Like many herbal extracts, dandelion has demonstrated antitumor effects *in vitro*^{26, 27}.

ii. *Animal data*: none

iii. *Human data*: none

13. **Antioxidant**: none

14. **Skin and mucus membranes**: Wart remedy. Direct application of dandelion juice to the lesion is a popular wart remedy which has not undergone thorough scientific evaluation, but is probably as safe and effective as most other home remedies for warts¹.

16. **Other/miscellaneous**: none

Toxicity and Contraindications

All herbal products carry the potential for contamination with other herbal products, pesticides, herbicides, heavy metals, and pharmaceuticals.

This is particularly concerning for imports from developing countries.

Furthermore, allergic reactions can occur to any natural product in sensitive persons

Allergic reactions and contact dermatitis to dandelion have been reported; taraxinic acid appears to be the most allergenic component of the plant²⁸⁻³⁷.

Potentially toxic compounds in dandelion: None

Acute toxicity: Aside from acute allergic reactions, no acute toxicity has been observed. Doses of up to 6 grams per kg body weight administered daily for seven days to rabbits did not result in measurable toxicity²².

Chronic: None reported. Carcinogenesis was not observed in rats whose diet contained up to 33% dandelion for several months³⁸. Dandelion is one of several vegetables that demonstrate antimutagenic effects³⁹.

Limitations during other illnesses or in patients with specific organ dysfunction: Unknown; herbalists traditionally recommend that dandelion be avoided by patients with biliary occlusion, acute cholecystitis and ileus^{9, 40}.

Interactions with other herbs or pharmaceuticals: Unknown; none reported. Some herbalists recommend avoiding the combination of dandelion and diuretic medications, but no adverse effects from this combination have been reported¹¹.

Safety during pregnancy, lactation and/or childhood: Unknown. No adverse effects have been reported when taken in doses usually consumed as food.

Typical Dosages

Provision of dosage information does NOT constitute a recommendation or endorsement, but rather indicates the range of doses commonly used in herbal practice.

Doses are given for single herb use and must be adjusted when using herbs in combinations.

Doses may also vary according to the type and severity of the condition treated and individual patient conditions.

Adult doses: There is disagreement on the optimal form and dose of dandelion. Reputable physicians and herbalists recommend a range of doses^{4, 9, 11}:

Fresh leaves: 4-10 grams daily

Dried leaves: 4-10 grams daily

Fresh leaf juice: 1 tsp (4-8 ml) twice daily

Fluid extract: 1-2 teaspoons daily

Fresh roots: 2-8 grams daily

Dried powdered extract: 250-1000 mg three to four times daily

Tea: Pour 2 cups boiling water over one ounce of fresh leaves and steep for 10 minutes.

Or, boil 1 cup of water with 2-3 tsp of dried, cut root for 15 minutes. Cool.

Pediatric dosages: Unknown

Availability of standardized preparations: None

Dosages used in herbal combinations: Variable

Proprietary names: Cholaktol TR, Galleb S, Justogen mono, Kneipp Lowenzahn-Pflanzensaft, Taraleon

Multi-ingredient preparations containing dandelion: Agnuchol, Agrimonas, Aristochol N, Berberis complex, Bio-Garten Tee, Chol-Grandelat, Cholongal, Cholosom, Fluid Loss, Galleb forte, Gallexier, Hepafungin, Helalixier, Herbal diuretic complex, Phytomed Hepato, Stomach mixture, Uva ursi complex, Uvacin, Waterlex

See Also:

Dandelion Clinician Information Summary:

<http://www.mcp.edu/herbal/dandelion/dandelion.cis.pdf>

Dandelion Patient Fact Sheet: <http://www.mcp.edu/herbal/dandelion/dandelion.ph.pdf>

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