Elecampane

Inula helenium

Common names

Inula, elfwort, scabwort, elf dock, wild sunflower, horseheal, velvet dock

Family

Asteraceae (daisy)

Part used

Root, rhizome

Background and traditional uses

Elecampane is a striking perennial herb from the *Asteraceae* family that grows between a height of 90 to 150cm. It is native to many areas of Europe, Asia and Africa.[1] It has thick, fleshy rhizomes that have an initial somewhat glutinous taste that becomes aromatic, slightly bitter and pungent upon chewing. The rhizomes have an agreeably aromatic, somewhat camphoraceous (i.e. orris-like) odour.[2] The leaves are alternate along the stem, being very large at the base (up to 50cm long and 10cm wide), becoming smaller towards the top of the plant. The leaves and stems are pubescent and its bright yellow flowers grow in large, terminal heads that resemble double sunflowers.[2]

Although our modern use of elecampane is largely limited to respiratory complaints, ancient medicinal writings have praised the herb for all manner of tonic properties. An ancient Latin verse, '*enula campana reddit praecordia sana*', translates to 'elecampane will the spirits sustain'. Pliny wrote 'let no day pass without eating some of the roots of enula, considered to help digestion and cause mirth'.[2]

Due to its interesting flavours, elecampane was traditionally applied in a culinary context. The ancient Greek physicians recommended chewing the rhizomes during therapeutic fasts. The Medieval monks used it as a base for medicinal cordials and it was often candied and eaten as a therapeutic 'sweet meat' in England in the mid-1800's, eaten morning and night to stave off asthmatic symptoms and chewed while travelling to protect 'against poisonous exhalations and bad air'.[3]

Actions

Primary:[1,4]

- Expectorant
- Antitussive
- Diaphoretic
- Antibacterial

Secondary:[1,5]

- Uterine stimulant
- Diuretic

Applications and indications

- The British Herbal Pharmacopoeia (BHP) approves the use of elecampane for treatment of bronchitis, coughs, bronchial catarrh and dry, irritating coughs in children.[6]
- The King's American Dispensatory also notes the widespread use of elecampane as a uterine stimulant that can 'move dampness or stagnation in the pelvis'.[5]

Active constituents and pharmacodynamics

The main active constituents in elecampane are believed to be bitter principles, resins and up to 5% essential oils. The rhizomes of the herb are rich in carbohydrates, particularly the polysaccharide inulin and several fructooligosaccharides which are well-known for their prebiotic effects.[1]

Metabolite profiles of elecampane rhizomes have shown that they have a high content of **polyphenols**, which are likely to act as free radical scavengers. One study concluded that despite clinical evidence, the nutrient and phytochemical profile of elecampane supported its use as a 'functional food' with well-pronounced effects on both the respiratory and digestive systems.[1] The inulin and **mucilage** content of elecampane may well account for its antitussive and carminative effects.[7]

The BHP makes note of the importance of the **sesquiterpene lactones** in elecampane, namely alantolactone, isoalantolactone and their derivatives.[1,8]

Recent studies have demonstrated that root extracts of elecampane possess diuretic, cholagogue, antihelminthic, antitumour, antimicrobial and insecticidal activities. Furthermore, alantolactone and isoalantolactone have anticancer, anti-inflammatory, antimicrobial, antiproliferative and hepatoprotective properties and possess the potential to induce detoxifying enzymes.[9,10] In one study, out of seven compounds tested, alantolactone, isoalantolactone, and 5-alpha-epoxyalantolactone significantly induced quinine reductase activity in both Hepa1c1c7 and BPRc1 cells. This suggests that these sesquiterpenes present in elecampane warrant further evaluation as potential chemopreventive agents.[9]

Summary of clinical evidence

Clinical evidence for the actions of elecampane derived from human trials is lacking, however significant preclinical research lends weight to the traditional applications of the herb.

Peptic ulcer disease

In one trial of 102 patients with peptic ulcer disease, an extract of elecampane demonstrated significant ulcer-healing properties and was shown to relieve general symptoms and improve gastric mucosal circulation.[11]

Antioxidant and antimicrobial activity

In vitro studies have shown that extracts of elecampane have significant activity against *Mycobacterium tuberculosis*.[12] The antioxidant and antimicrobial activities of elecampane were measured in a study and were concluded to be derived from the phenolic compounds in the herb.[13]

Elecampane was identified as having a highly selective activity against four types of tumour cell lines in a study analysing potentially antineoplastic herbal medicines.[14] The authors of the study claimed elecampane would make an excellent candidate for further anticancerous investigations, especially considering the extract displayed no mutagenic activity in the Ames test.[14]

In one *in vivo* study, elecampane preparations were shown to produce a protective effect on carbohydrate metabolism, lipid peroxidation processes, blood and internal organs in mice induced with acute stress.[15]

An *in vitro* study designed to investigate the bactericidal activity of elecampane showed that extracts were 100% effective against 200 *Staphylococcus aureus* isolates, including proven antibiotic-resistant and sensitive strains.[16]

Dosage summary

Liquid extract (1:1): 30-80mL weekly[6]
Liquid extract (1:2): 20-40mL weekly[11]
Dried herb equivalent: 1.5-4g of the root/rhizome three times daily.[18]

Safety information

- Elecampane is best avoided during pregnancy due to its traditional reputation as a uterine stimulant.[18]
- Elecampane should not be prescribed to individuals with known allergy or sensitivity of plants in the *Asteraceae* family.
- Used orally in large amounts, elecampane can cause gastrointestinal upset and symptoms of paralysis. Do not use outside of recommended dosage range.[18]

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