

Master data ingredient / monograph

Ingredient/plant:	Arnica (<i>Arnica montana</i>)
Scientific name:	<i>Arnica montana</i>
Order:	Asterales
Family:	Asteraceae (Korbblütengewächse)
Subfamily:	-
Genus:	<i>Arnica</i>
Species:	<i>Arnica montana</i>

Description:

Arnica (*Arnica montana* L.) is a perennial plant with a height of 5–100 cm, the rhizomes are relatively long and thin; caudices woody, relatively short and thick. The stems are erect, simple or branched. Leaves of *Arnica* are basal (sterile basal rosettes often present) and/or cauline; mostly opposite (usually 1–10 pairs, distalmost sometimes alternate and usually smaller); petiolate or sessile; blades mostly cordate, deltate, elliptic, lanceolate, linear, oblanceolate, oblong, obovate, ovate, or spatulate, margins entire or toothed (usually dentate, denticulate, or serrate, sometimes crenate or slightly lobed), faces glabrous, hirsute, hispidulous, pilose, puberulent, scabrous, tomentose, villous, or woolly, often stipitate-glandular as well. The heads of the plant are radiate or discoid, borne singly or in cymiform or corymbiform arrays.

Ray florets, 5–22, pistillate, fertile; corollas yellow to orange. Disc florets 10–120, usually bisexual and fertile (functionally staminate in *A. dealbata*); corollas usually yellow, rarely cream, tubes shorter than funnellform throats, lobes 5, ± deltate (anthers usually yellow, purple in *A. lessingii* and *A. unalaschcensis*).

Arnica is circumboreal, predominantly montane, and exhibits maximum species diversity in western North America. It includes common and very widespread species as well as relatively uncommon, narrow endemics. *Arnica montana* from Europe has been used medicinally for centuries, and unsubstantiated claims have been made regarding the medicinal properties of some North American species.

Ploidy and apomixis are common in the genus, resulting in considerable morphologic variability. Species 29 (26 in the flora): North America, Mexico, Europe, Asia (Japan, Russia).

In the United States, *arnica* is listed by the FDA as an unsafe herb and is only allowed for food use in alcoholic beverages, where it serves as a flavoring agent. *Arnica* contains some highly poisonous compounds, such as helenalin, and is

considered unsafe for oral use. In addition to the sesquiterpenoid lactone helenalin, arnica contains carbohydrates, such as inulin; amines, such as betaine and choline; coumarins; flavonoids, such as quercetin, kaempferol, isorhamnetin and luteolin; thymol; caffeic acid; phytosterols; and other sesquiterpenoid lactones, such as 11 α , 13-dihydrohelenalin and chamissonolid. Arnica from the Mexican medicinal plant *Heterotheca inuloides* also contains the sesquiterpenoids 7-hydroxy-3, 4-dihydrocadalin and 7-hydroxycadalin.

Arnica is available in homeopathic preparations, in herbal tinctures and in topical products. Externally applied tinctures of arnica are commonly used in countries such as Germany to treat contusions, sprains, hematomas, rheumatic disorders and superficial inflammations of the skin.

Properties:

Arnica has putative analgesic and antiphlogistic activities.

Pharmacological properties:

The sesquiterpenoid lactone helenalin and, to lesser degrees, the sesquiterpenoid lactones 11 α , 13-dihydrohelenalin and chamissonolid are reported to inhibit the activation of the transcription factor NF-kappa B by directly modifying this factor. Activation of NF-kappa B leads to inflammatory activity. This could account, at least in part, for the possible anti-inflammatory and analgesic actions of topical arnica preparations. There is no credible research supporting anti-inflammatory and/or analgesic activity for ingested arnica.

a) analgesic properties

Experimental studies showed that the sesquiterpenoid lactone helenalin can cause analgesic actions.

b) antiphlogistic properties

In vitro studies revealed antiphlogistic effects.

c) antimicrobial properties

The sesquiterpenoids isolated from *Heterotheca inuloides* - 7-hydroxy-3,4-dihydrocadalin and 7-hydroxycadalin - have been reported to have activity against Gram-positive bacteria, including methicillin-resistant *Staphylococcus aureus* (MRSA). The mechanism of this antibacterial activity is unknown. Similarly unknown is how the antibacterial activities of the compounds relate to any possible action of Mexican arnica. In fact, one study reported only slight *in vitro* activity of *Arnica* against oral pathogens.

Cosmetic properties:

Extracts of Arnica are often used in cosmetic products, like hair tonics, tooth pastes and others. Furthermore Arnica extract is used as an cosmetic additive in creams and

face lotions. In these preparations the nurturing properties of Arnica on the skin are important. Due to the content of essential oils Arnica shows on the skin freshening and bracing effects. A possible influence on the collagen synthesis by Arnica is actually discussed among scientists.

Possible interactions:

Arnica may potentiate the adverse effects of drugs known to cause a prolonged QT interval. Such drugs include quinidine, procainamide, disopyramide, sotalol, amiodarone. Arnica may potentiate the adverse effects of drugs known to cause a prolonged QT interval. Such drugs include quinidine, procainamide, disopyramide, sotalol, amiodarone, chlorpromazine, prochlorperazine, haloperidol, pentamidine, amitriptyline, desipramine and doxepim.

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Use:

Internal and external preparations made from the flowering heads of Arnica have been used medicinally for hundreds of years. Alcoholic tinctures were used by early settlers to treat sore throats, as a febrifuge, and to improve circulation. Homeopathic uses included the treatment of surgical or accidental trauma, as an analgesic, and in the treatment of postoperative thrombophlebitis and pulmonary emboli. It has been used externally for acne, bruises, sprains and muscle aches, and as a general topical counterirritant. *Arnica* has been used extensively in European folk medicine. German philosopher Johann Wolfgang von Goethe (1749-1832) was said to have drunk arnica tea to "ease" his angina. *Arnica's* bactericidal properties were employed for abrasions and gunshot wounds.

Arnica and its extracts have been widely used in folk medicine. It is used externally as a treatment for acne, boils, bruises, rashes, sprains, pains, and other wounds. It has also been used for heart and circulation problems, to reduce cholesterol, and to stimulate the CNS.

The German Commission E recommends Arnica's flowering heads for external use, especially in the treatment of accident's consequences like injuries, hematoma, bruises and contusions. Furthermore an external administration is recommended in rheumatoid muscle and joint pain, stomatitis and inflammations after insect bites.

Limits of administration:

Oral use of Arnica is considered unsafe. Topical use of arnica on broken skin and open wounds is also considered unsafe.

Arnica is contraindicated in those who are allergic to it or who have known allergies or hypersensitivity to other members of the daisy family, such as chamomile and marigolds. Contact dermatitis also has occurred. It is contraindicated in pregnant women and nursing mothers.

Assessment/safety factors and toxicity:

The plant is poisonous and ingestion can cause stomach pain, diarrhea and vomiting, dyspnea, cardiac arrest, and death.

Internal consumption of arnica is not recommended, because it is considered poisonous. Numerous cases of contact dermatitis, manifested as pruritus and erythema, have been reported from the plant.

Sesquiterpenoid lactones in Arnica, such as helenalin, are intensely poisonous and cardiotoxic. Therefore, oral use of arnica is considered unsafe, as is topical use of arnica on broken skin and open wounds. Those with hypertension, cardiac arrhythmias, and those taking drugs known to cause a prolonged QT interval or drugs known to be potentially cardiotoxic, should be extremely cautious about the use of arnica.

Further remarks and characteristics:

None.

References:

Ernst E., Pittler M.H.:

"Efficacy of homeopathic arnica: a systematic review of placebo-controlled clinical trials,"

Arch. Surg. 133, 1187-1190, 1998

Hart O., Mullee M.A., Lewith G., Miller J.:

"Double-blind, placebo-controlled, randomized clinical trial of homeopathic arnica C30 for pain and infection after total abdominal hysterectomy",

J. R. Soc. Med. 90, 73-78, 1997

Hausen B.M.:

„Arnica allergy“,

Hautarzt 31, 10-17, 1980

Hörmann H.P., Kortin H.C.:

„Allergic acute contact dermatitis due to Arnica tincture self-medication“,

Phytomedicine 4, 315-317, 1995

Jänicke C., Grünwald J., Brendler Th.:

„Handbuch Phytotherapie – Indikationen-Anwendungen-Wirksamkeit-Präparate“,
Wiss. Verlagsgesellschaft Stuttgart, 2003

Lyss G., Knorre A., Schmidt T.J. et al.
“The anti-inflammatory sesquiterpene lactone helenalin inhibits the transcription
factor NF-kappa B by directly targeting p65”,
J. Biol. Chem. 273, 33508-33516, 1998

Lyss G., Schmidt T.J., Merfort I., Pahl H.L.:
“Helenalin, an anti-inflammatory sesquiterpene lactone from arnica, selectively
inhibits transcription factor NF-kappa B”,
Biol. Chem. 378, 951-961, 1997

Merfort I.:
“Neue Untersuchungen zur anti-phlogistischen Aktivität der Arnikablüten”,
Z. Phytother. 21, 43-45, 2000

Schroder H., Losche W., Strobach H. et al.:
“Helenalin and 11alpha, 13-dihydrohelenalin, two constituents from Arnica montana
L., inhibit human platelet function via thiol-dependent pathways”,
Thromb Res. 57, 839-845, 1990

Tveiten D., Bruseth S., Borchgrevink C.F., Lohne K.:
“Effect of Arnica D 30 during hard physical exertion. A double-blind randomized trial
during the Oslo Marathon 1990”,
Tidsskr Nor Laegeforen 111, 3630-3631, 1991

Vickers A.J., Fisher P., Smith C. et al.:
“Homeopathic Arnica 30X is ineffective for muscle soreness after long-distance
running: a randomized, double-blind, placebo-controlled trial”,
Clin. J. Pain 14, 227-231, 1998

Wei D., Reuter H.D.:
„Einfluss von Arnika-Extrakt und Helenalin auf die Funktion menschlicher Blut-
plättchen“,
Z. Phytother. 9, 26, 1988