ARNICA MONTANA

General Information

English Name	Arnica, mountain arnica, leopardsbane
German Name	Echte Arnika, Berg-Wohlverleih
French Name	Arnica montana, Arnica des montagnes, plantain des Alpes
Latin Name	*Arnica montana* L.
Family	Asteraceae
Used plant part	Flower
INCI EU	Arnica Montana Flower Extract
INCI US	Arnica Montana Flower Extract
INCI CN	Arnica Montana Flower Extract
INCI JP	Arnica Montana Flower Extract
CAS	68990-11-4
EC	273-579-2

Plant Description

Arnica is an aromatic perennial growing plant. It grows up to 30 cm and has downy egg-shaped leaves and bright yellow daisylike flowers. Arnica is native to the mountains of Alps, Europe, Pyrenees, Balkan mountains, Scandinavia and the Baltic states. Its flowers are harvested when in full bloom. Arnica has been used extensively in European folk medicine. An effective ointment and compress for hematoma, bruises, sprains, and muscle pain and against inflammations [1].

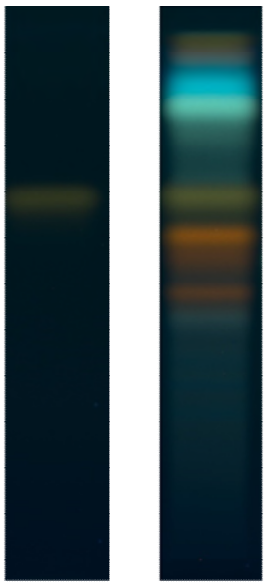
Plant Ingredients

Arnica contains sesquiterpene lactone, flavonoids, a volatile oil that includes thymol, mucilage and polysaccharides [2].

Analysis of the Arnica Montana Flower Extract Manufactured at Botanica

HPTLC analysis was performed at Botanica. HPTLC stands for **high performance thin layer chromatography** and is an advancement of thin layer chromatography in terms of automation, resolution and accuracy. It is widely used for analysis of medicinal plants and allows for qualitative analysis, screening of substance groups (fingerprint) or substance identification in comparison with a reference. In principle, a compound with higher binding affinity to the so-called stationary phase moves less higher up the plate than a compound which dissolves better in the so-called mobile phase. This allows for separation of compounds of different chemical properties.

Figure 1 below shows an HPTLC fingerprint of flavonoids of P-00000739 "Arnica Montana Flower Extract 'C' G in Glycerine, not preserved", lot 19090101. It shows a nice pattern of high component diversity. In addition, **kaempferol-3-glucoside** is identified. Kaempferol-3-glucoside (Figure 2) is a water-soluble phenolic compound and belongs to the class of flavonoids. It is known for its antioxidant, antimicrobial and anti-inflammatory activities [3,4].



Kaempferol-3-glucoside | Arnica Montana Flower Extract P-00000739

Figure 1. Left: Kaempferol-3-glucoside reference standard, right: HPTLC fingerprint of flavonoids of Arnica Montana Flower Extract P-00000739 (can slightly vary between different production lots)

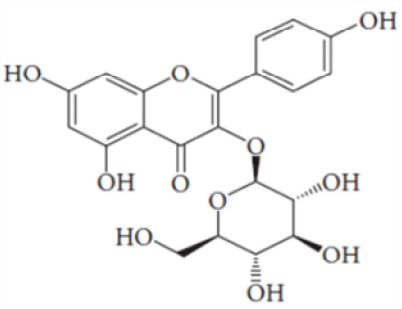


Figure 2. Chemical structure of kaempferol-3-glucoside

Based on literature and the identified components of the extract of *Arnica montana* flower (flavonoids, kaempferol-3-glucoside), it is attributed with following **effects** [3,4,5,6]:

- Antioxidant
- Antimicrobial
- Anti-inflammatory

Therefore, following **cosmetic applications** are suggested [5,6]:

Anti-aging Wound-healing Whitening

Skin protection

Literature

[1] European Medicine Agency (EMA) (2014) Committee on Herbal Medicinal Products (HMPC): Assessment Report on *Arnica montana* L., flos. EMA/HMPC/198794/2012

[2] HagerROM 2006 - © 2006 Springer Medizin Verlag Heidelberg.

[3] Cushnie TPT and Lamb AJ (2005) Antimicrobial Activity of Flavonoids. International Journal of Antimicrobial Agents 26(5):343-56

[4] Riaz A, Rasul A, Hussain G et al. (2018) Astragalin: A Bioactive Phytochemical with Potential Therapeutic Activities. Advances in Pharmacological Sciences 2018:1-15

[5] Merfort I (2010) Arnika – Aktueller Stand hinsichtlich Wirksamkeit, Pharmakokinetik und Nebenwirkungen. Zeitschrift für Phytotherapie 31:188-192

[6] Kriplani P, Guarve K and Baghael US (2017) *Arnica montana* L. – A Plant of Healing: Review. Journal of Pharmacy and Pharmacology 69:925-945

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