

## Master data ingredient / monograph

<b>Ingredient/plant:</b>	Mountain pine ( <i>Pinus mugo subsp. pumilio</i> ) (GERMAN. Latschenkiefer)
Scientific name:	<i>Pinus mugo subsp. pumilio</i>
Order:	Pinales
Family:	Pinaceae
Genus:	<i>Pinus</i>
Species:	<i>Pinus mugo</i>
Subspecies:	<i>Pinus mugo subsp. pumilio</i>

### Description:

**Mountain Pine** or **Mugo Pine** (*Pinus mugo*) is a high altitude European pine, found in the Pyrenees, Alps, Erzgebirge, Carpathians, northern Apennines and Balkan Peninsula mountains from (mostly) 1,000 m to 2,200 m, occasionally as low as 200 m in the north of the range in Germany and Poland, and as high as 2,700 m in the south of the range in Bulgaria.

There are two subspecies:

***Pinus mugo subsp. mugo*** and also the subspecies ***pumilio*** in the east and south of the range (southern & eastern Alps, Balkan peninsula), a low, shrubby, often multi-stemmed plant to 3-6 m tall with symmetrical cones.

***Pinus mugo subsp. uncinata*** in the west and north of the range (Pyrenees northeast to Poland), a larger, usually single-stemmed tree to 20 m tall with asymmetrical cones (the scales are much thicker on one side of the cone than the other). The two subspecies intergrade extensively (hybrid subspecies *rotundata*) in the western Alps and northern Carpathians. Some botanists treat the western subspecies as a separate species, *Pinus uncinata*, others as only a variety, *Pinus mugo* var. *rostrata*.

Both subspecies have similar foliage, with dark green leaves ('needles') in pairs, 3-7 cm long. The cones are nut-brown, 2.5-5.5 cm long, symmetrical, thin-scaled and matt texture in subsp. *mugo*, asymmetrical with thick scales on the upper side of the cone, thin on the lower side, and glossy, in subsp. *uncinata*.

The species is highly valued in horticulture, particularly the smaller subsp. *mugo*.

An old name for the species *Pinus montana* is still occasionally seen, and a typographical error "*mugho*" (first made in a prominent 18th century encyclopedia) is still repeated surprisingly often.

## Properties:

Essential oil of mountain pine shows beneficial effects in cases of catarrhs in upper and lower air passages and also, in cases of external use as a supportive therapy in rheumatic diseases. Mountain pine oil shows strong effects on blood circulation, which will be enhanced after topical administration of the oil.

### ***Pharmacological properties:***

Essential oil of mountain pine is a clear, colourless to slight yellowish fluid. It consists of a mixture of about 60 single substances, which all belong to the group of terpene hydrocarbons.

The main substances are  $\alpha$ -pinen,  $\beta$ -pinen,  $\Delta^3$ -caren and limonene. Depending from the species the content of this substances is very variable (Rimpler H. 1999).

### ***Active ingredients of *Pinus mugo ssp. Pumilio*:***

- $\Delta^3$ -caren (amount up to 35 %)
- $\alpha$ - and  $\beta$ -pinen (amount: 20 %)
- $\beta$ -phellandrene (amount about 15 %)

As revealed in experimental studies in guinea pigs the essential oil of mountain pine shows antimicrobial, spasmolytic and expectorant properties (Schäfer D. et Schäfer W. 1981). Furthermore in cases of topical administration a stimulation of blood circulation was shown, this effect is mainly caused by  $\Delta^3$ -caren.

In the 19 th century pharmacists recognized for the first time the beneficial effects of essential oil of mountain pine. 1856 the german pharmacist Matthias Mack was the first, who isolated the native essential oil. All over his life he extensively studied mountain pine oil and developed several recipes for internal and topical use of mountain pine oil. Since these times mountain pine oil is an important ingredient of cosmetic preparations, like balms, lotions and baths.

### ***Topical and cosmetic properties:***

Based on the studies of Mack mountain pine oil is nowadays an active ingredient of different preparations for topical use either in medicinal products or cosmetic products. Especially for inhalations mountain pine oil is very suitable.

In the cosmetic field products containing mountain pine oil are also available. Due to the stimulating effect on skin and blood vessels mountain pine oil is a main ingredient in massage oils, soaps, shower gels and preparations for foot care. The special relaxing and stimulating effects of these preparations are mainly caused by the ingredients  $\Delta^3$ -caren and  $\alpha$ - and  $\beta$ -pinen.

### ***Possible interactions:***

If used as recommended adverse reactions of mountain pine essential oil are not known. Highly sensitive persons may develop irritations of skin and mucous membranes.

**Use:**

In general mountain pine is used in two different ways. The wood of mountain pine is used for blunding and is therefore important for wood turners, especially for simple furnitures.

An very important application of mountain pine is the use of its oil in cosmetic industries. Fresh needles, twigs and limbs contain a oil which can be isolated by distillation. The rate of yield depends on the harvesting time: in january the yield rate amounts approximately 0.6 %; in august about 0.3 %.

Pure finished oil use is sold for internal and external use in cases of catarrhs in upper and lower air paasages. In baths the oil can be used as a supportive therapy in cases of rheumatic diseases (Rimpler H. 1999; Graßmann J. et al. 2005).

**Limits of administration:**

Preparations containing mountain pine oil should not be administered:

- in cases of large skin injuries
- in patients suffering from asthmatic diseases
- in patients suffering from hypertension or cardiac insufficiency

**Assessment/safety factors and toxicity:**

Topical preparations containing mountain pine oil are generally recognised as safe. This is based on the long traditional use of the substance.

Due to this fact the german commission E strongly recommends in their monographs, dated 1985 and 1990, the external and internal use of mountain pine oil, especially in cases of catarrhs in upper and lower air passages and also, in cases of external use as a supportive therapy in rheumatic diseases. The beneficial effects are proved in several studies, which unfortunately are not completely in accordance with the modern GCP-rules of our times. The traditional use however and the absence of severe adverse reactions lead in total to a positive assessment of the substance.

**Further remarks and characteristics:**

None

## References:

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