



# Pinolumin

## Relax your skin – enjoy a flawless complexion

# The Swiss Stone Pine



- *Pinus cembra*, also known as Swiss stone pine or Arolla pine, is a species of pine tree that grows in the Alps.
- It typically grows at 1,500 to 2,500 m altitude. It often reaches the alpine tree line in this area. The mature size is about 25 m in height.

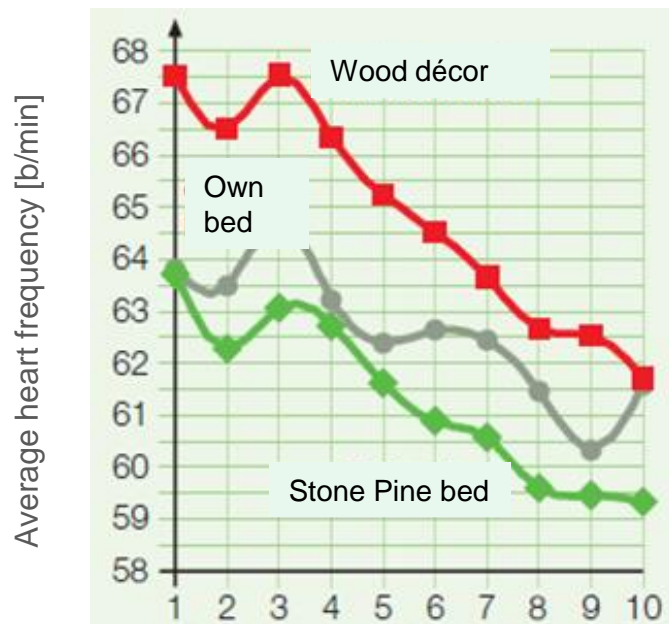
# The Queen of the Alps – an Extremely Resistant Tree



- The Swiss stone pine is extremely tolerant of severe winter cold, down to  $-50^{\circ}\text{C}$  and up to  $+40^{\circ}\text{C}$  and also of wind exposure.
- It is the most cold resistant tree in the Alps.
- Life span of *Pinus cembra*: 1200 y

# Swiss Stone Pine Bed: Heartbeat Reduction Over Night

Heart frequency during the night



Sleeping phases [units of 30 min]

When sleeping in a Swiss stone pine bed, the heart beat frequency is reduced, saving 3500 beats/day, which corresponds to 1 hour less stress per day.

→ The wood of Swiss stone pine fosters relaxation and deep sleep phases and helps regeneration from mental and physical stress.

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# Use of Swiss Stone Pine Wood



- The wood of Swiss stone pine is extremely well suited for furniture and carving.
- Its relaxing effect favors the Stone Pine Wood for the production of beds and sleeping room furnishing.

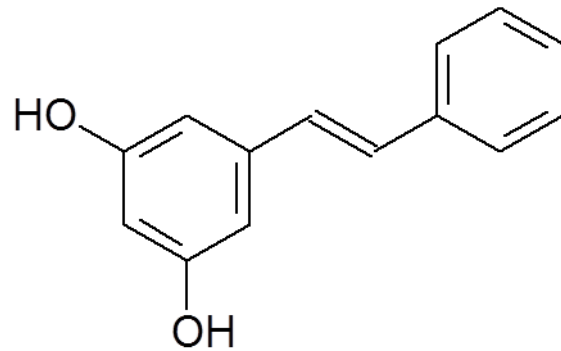
# Use of Stone Pine Wood



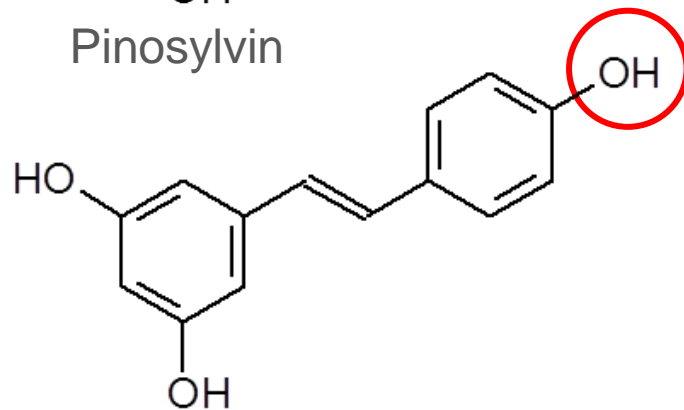
Wood shavings are used for pillow fillings for a restful night's sleep.



# Pinosylvin is Similar to Resveratrol



Pinosylvin



Resveratrol

- Wood and needles of Swiss stone pine contain high concentrations of pinosylvin
- Pinosylvin is a stilbenoid (such as resveratrol) which has strong antioxidant activity
- Acts against fungal infections of the plant

# Pinosylvin Facts



- Antibacterial and antifungal activities, more potent against certain types of yeast than resveratrol (Lee et al., 2005)
- Ozone dose-dependent expression of pinosylvin as a stress response mechanism (Chiron et al., 2000)
- Cancer chemoprotective by suppressing the matrix metalloproteases MMP-2 and MMP-9 (Park et al., 2012)
- Pinosylvin monomethyl ether suppresses TRP channels in neurons which signal pain upon irritation (Yu et al., 2013)
- Significantly decreased the formation of oxidants, both extra- and intracellular and can help inhibit persistent inflammation (Jančinová et al., 2012)
- Induction of AMPK-mediated autophagy (Park et al., 2014)



# Pinolumin Composition

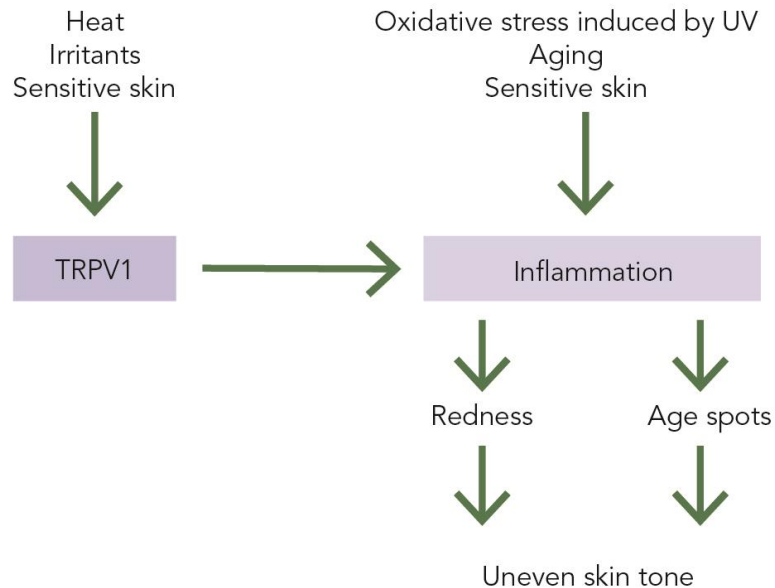
Swiss stone pine extract:

Plant material used for extraction	5.25%
Ethanol	15%
Pentyleneglycol	10%
Water	ad 100%

## **INCI (EU-Declaration / PCPC-Declaration)**

Pinus Cembra Wood Extract (and) Alcohol (and) Pentylene Glycol (and) Aqua /  
Water

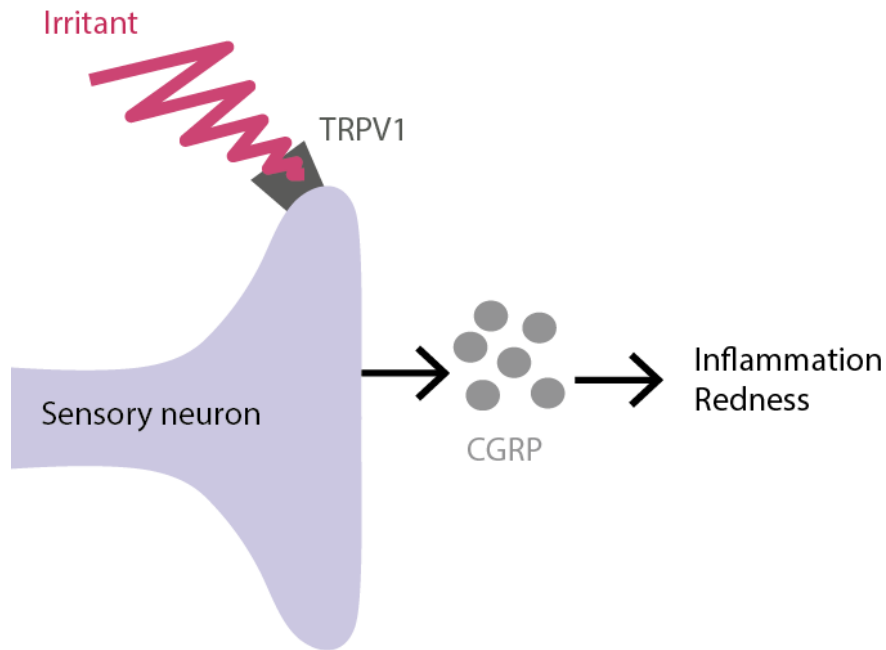
# Inflammation Leads to Uneven Skin Tone



- The skin contains a dense network of sensory neurons.
- The TRPV1 receptor (Transient Receptor Potential Vanilloid-1) is one of the major sensors in the skin.
- TRPV1 is expressed in nervous fibers and keratinocytes.
- TRPV1 is activated by different stimuli such as heat and chemical irritants.
- In sensitive skin, the response of this receptor is exaggerated → neurogenic inflammation → uneven skin tone.

# In-Vitro Study

## Inhibition of Neuro-Inflammation



### Cell culture

Sensory neurons

### Irritant

+/- Capsaicin

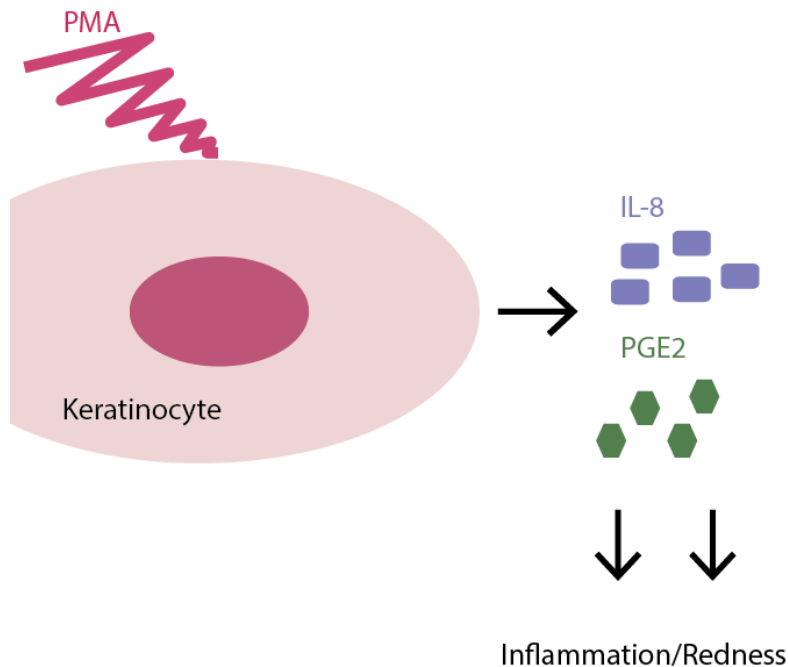
### Mechanism

Capsaicin binds specifically to the TRPV1 receptor → detection of released CGRP.

CGRP is a neuropeptide which activates the release of pro-inflammatory mediators.

TRPV1: Transient Receptor Potential Vanilloid-1  
CGRP: Calcitonin Gene Related Peptide

# Anti-Inflammatory Activity



## Cell culture

NCTC 2544 keratinocytes

## Induction of inflammation

PMA (Phorbol Myristate Acetate)

## Detection of:

- *Interleukin-8 (IL-8)*: Cytokine, indicator of skin inflammation, produced in the skin by e.g. keratinocytes and fibroblasts in response to inflammatory stimuli  
→ attracts leucocytes to an inflammatory area.
- *Prostaglandin E2 (PGE2)*: lipidic mediator that induces vasodilatation and facilitates the action of pain mediators.

# Pinolumin Claim Ideas



- Calms sensitive and irritated skin
- Visibly reduces redness and age spots
- Creates a more even toned skin for a youthful radiance
- Protects from the effects of environmental stress

# Pinolumin Applications



- Skincare and suncare for sensitive skin
- Neurocosmetics
- Radiance booster
- CC creams (color control)

# Pinolumin Marketing Benefits



- “Swissness” claim
- Preservative-free
- Multi-targeted soothing approach