Juniperus communis

TAXONOMICAL CLASSIFICATION:[1]

- *Kingdom: Plantae*
- *Phylum: Spermatophyta*
- *Subphylum: Gymnospermae*
- *Class: Pinopsida*

INTRODUCTION:[2]

J. communis is found in Himachal Pradesh at an altitude of 3000 m–4200 m. It is mainly distributed in Manimahesh in Chamba, Kullu, Churdhar in Sirmour, Chhota and Bara Bhnghal in Kangra, and Kinnaur and Pattan valley in LahaulSpiti districts. The plant also grows in Europe south-western Asia, and North America. Fruit subspherical, purplish-black showing a "bloom" (0.5–1.0 cm in diameter): at the base are six, small, pointed, bracts arranged in 2 whorls, occasionally 3 or 4 whorls present; apex shows triradiate mark and depression indicating the suture; three hard, triangular seeds are embedded in the fleshy mesocarp, having terebinthne odour and bitter taste. c. Seed coat shows 2-3 layers of thin-walled cells which are externally covered by a thin cuticle and which are internally followed by thick-walled polygonal sclerenchymatous cells. Endosperm and embryo are not distinct. Outer layer of fruit shows 3-4 large cubic or tabular cells having thick, brown porous walls. Sarcocarp consists of large, thin-walled, elliptical, loosely coherent cells, containing prismatic crystals of calcium oxalate and drops of essential oil. It contains various chemical constituents including flavonoids, volatile oil, and coumarins. Berries contain apigenin, rutin, luteolin, quercetin-3-O-arabinosyl-glucoside, quercetin-3-o-rhamnoside quercitrin, scutellarein, nepetin, amentoflavone, and bilobetin.

J. communis L.

Juniperus leaves

Juniperus berries

PROPERTIES AND USES: [3,4]

- Hepatoprotective Activity
- Anti-Inflammatory Activity
- Antioxidant Activity
- Antidiabetic
- Antihyperlipidemic Activity
- Analgesic Activity
- Antibacterial Activity
- Antimicrobial Activity.
- Antifungal Activity
- Antimalarial Activity
- Antihypercholesterolemic Activity
- Anticataleptic Activity.
- Neuroprotective Activity
- Anti-fertility effects
- digestive, carminative, anti-spasmodic and anti-bacterial action
- Anti-proliferative activity
- urinary antiseptic and diuretic

SIDE EFFECTS OF EXCESS CONSUMPTION:[5]

- A skin rash
- Trouble breathing
- Kidney damage (from excessive use)
- Increase in blood sugar levels (people with diabetes should use with caution and the healthcare provider should be notified before using)
- If allergic symptoms occur after the use of juniper berries, it's important to seek medical care before continuing use.

DOSAGE: [6]

- Generally, 2 to 10 g/day of the whole, crushed, or powdered fruit (corresponding to 20 to 100 mg of essential oil) has been used for dyspepsia.
- Essential oil: 0.02 to 0.1 mL 3 times daily.
- Fluid extract: 1:1 (g/mL); 2 to 3 mL 3 times daily.
- Infusion: 2 to 3 g steeped in 150 mL of boiled water for 20 minutes 3 times daily.

RESEARCH:

1. The essential oil of juniper berries (*Juniperus communis* L., Cupressaceae) is traditionally used for medicinal and flavoring purposes. As elucidated by gas chromatography/flame ionization detector (GC/FID) and gas chromatography/mass spectrometry (GC/MS methods), the juniper berry oil from Bulgaria is largely comprised of monoterpene hydrocarbons such as α-pinene (51.4%), myrcene (8.3%), sabinene (5.8%), limonene (5.1%) and β-pinene (5.0%). The antioxidant capacity of the essential oil was evaluated *in vitro* by 2,2-Diphenyl-1-picrylhydrazyl (DPPH) scavenging, 2,2-azino-bis-3-ethylbenzothiazoline-6 sulfonic acid (ABTS) radical cation scavenging, hydroxyl radical ($OH^{\bullet}$) scavenging and chelating capacity, superoxide radical ($^{\bullet}O_2^-$) scavenging and xanthine oxidase inhibitory effects, hydrogen peroxide scavenging. The antioxidant activity of the oil attributable to electron transfer made juniper berry essential oil a strong antioxidant, whereas the antioxidant activity attributable to hydrogen atom transfer was lower. Lipid peroxidation inhibition by the essential oil in both stages, *i.e.*, hydroperoxide formation and malondialdehyde formation, was less efficient than the inhibition by butylated hydroxytoluene (BHT). *In vivo* studies confirmed these effects of the oil which created the possibility of blocking the

oxidation processes in yeast cells by increasing activity of the antioxidant enzymes superoxide dismutase (SOD), catalase (CAT), and glutathione peroxidase (GPx) [8]

2. Essential oils are known to possess antimicrobial activity against a wide spectrum of bacteria and fungi. In the present work the composition and the antifungal activity of the oils of *Juniperus communis* subsp. *alpina* (Suter) Čelak were evaluated. Moreover, the skin cytotoxicity, at concentrations showing significant antifungal activity, was also evaluated. The oils were isolated by hydrodistillation and analysed by gas chromatography and gas chromatography–mass spectrometry. Minimal inhibitory concentration (MIC) and minimal lethal concentration (MLC) were used to evaluate the antifungal activity of the oil against dermatophytes (*Epidermophyton floccosum, Microsporum canis, M. gypseum, Trichophyton mentagrophytes, T. mentagrophytes* var. *interdigitale, T. rubrum, T. verrucosum*), yeasts (*Candida albicans, C. guillermondii, C. krusei, C. parapsilosis, C. tropicalis, Cryptococcus neoformans*) and *Aspergillus* species (*Aspergillus flavus, A. fumigatus, A. niger*). Cytotoxicity was tested in HaCaT keratinocytes through the 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay. Essential oil of *J. communis* subsp. *alpina* needles was predominantly composed of monoterpene hydrocarbons (78.4%), with the main compounds being sabinene (26.2%), α-pinene (12–9%) and limonene (10.4%). Results concerning the antifungal activity demonstrated the potential of needle oil against dermatophytes, particularly for *Microsporum canis* and *Trichophyton rubrum* with MIC and MLC of 0.32 μL/mL. Furthermore, evaluation of cell viability showed no significant cytotoxicity in HaCaT keratinocytes at concentrations between 0.32 and 0.64 μL/mL. These results show that it is possible to find appropriate doses of *J. communis* subsp. *alpina* oil with both antifungal activity and a very low detrimental effect on keratinocytes. [9]

3. Although juniper (*Juniperus communis*) berry essential oil (JEO) has been used in skin care products, research on its biological activity in human skin cells is scarce. In the current study, author explored the biological activity of JEO (with alpha-pinene as the major active component) in pre-inflamed human dermal fibroblasts, which were designed to mimic the disease biology of chronic inflammation and fibrosis. We analyzed the levels of 17 important protein biomarkers pertinent to inflammation and tissue remodeling. JEO exhibited robust antiproliferative activity and significantly inhibited the increased production of the proinflammatory chemokines interferon gamma-induced protein 10 (IP-10) and interferon-inducible T-cell alpha chemoattractant (I-TAC). Additionally, JEO significantly inhibited tissue remodeling biomarkers, namely collagen I,

collagen III, and plasminogen activator inhibitor 1 (PAI-I). Macrophage colony-stimulating factor (M-CSF), an immunomodulatory protein molecule, was also significantly downregulated by JEO. Moreover, we found that JEO robustly modulated global gene expression. Ingenuity Pathway Analysis also showed that JEO affected many important signaling pathways that are closely related to metabolism, inflammation, immune response, wound healing, and cancer biology. This study provides the first evidence of the biological activity of JEO in human dermal fibroblasts. Thus, JEO is a promising therapeutic candidate for inflammatory conditions in the skin.[10]

PRECAUTIONS & WARNINGS: [7]

Pregnancy and breast-feeding: It's **UNSAFE** to use juniper if you are pregnant or trying to become pregnant. Juniper's effects on the uterus might interfere with fertility or cause a miscarriage. It's also best to avoid using juniper if you are breast-feeding. Not enough is known about how juniper might affect a nursing infant.

Diabetes: Juniper berry might lower blood sugar. There is some concern that it might lower blood sugar too much in people with diabetes.

Stomach and intestinal disorders: Juniper berry might irritate the stomach and intestines, making disorders in these organs worse.

High blood pressure, low blood pressure: Juniper berry might affect blood pressure and could make blood pressure control more difficult.

INTERACTIONS: [7]

Moderate Interaction

Be cautious with this combination

- **Medications for diabetes (Antidiabetes drugs) interacts with JUNIPER**

Juniper might decrease blood sugar. Diabetes medications are also used to lower blood sugar. Taking juniper along with diabetes medications might cause your blood sugar to go too low. Monitor your

blood sugar closely. The dose of your diabetes medication might need to be changed.
Some medications used for diabetes include glimepiride (Amaryl), glyburide (DiaBeta, Glynase PresTab, Micronase), insulin, pioglitazone (Actos), rosiglitazone (Avandia), chlorpropamide (Diabinese), glipizide (Glucotrol), tolbutamide (Orinase), and others.

Minor Interaction

Be watchful with this combination

- **Water pills (Diuretic drugs) interacts with JUNIPER**

Juniper seems to work like "water pills" by causing the body to lose water. Taking juniper along with other "water pills" might cause the body to lose too much water. Losing too much water can cause you to be dizzy and your blood pressure to go too low.
Some "water pills" include chlorothiazide (Diuril), chlorthalidone (Thalitone), furosemide (Lasix), hydrochlorothiazide (HCTZ, Hydrodiuril, Microzide), and others.

REFERENCES:

1. https://www.cabi.org/isc/datasheet/29085
2. https://www.hindawi.com/journals/isrn/2014/634723/
3. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4897106/pdf/ISRN2014-634723.pdf
4. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6726717/pdf/main.pdf
5. https://www.verywellhealth.com/juniper-berry-benefits-4589326
6. https://www.drugs.com/npp/juniper.html
7. https://www.webmd.com/vitamins/ai/ingredientmono-724/juniper
8. https://www.mdpi.com/2076-3921/3/1/81
9. https://onlinelibrary.wiley.com/doi/abs/10.1002/ptr.3730
10. https://www.tandfonline.com/doi/full/10.1080/2331205X.2017.1306200