

## Balsam fir resin properties

Fir Tree Gum of the North inc.

**Status:** Antibiotic and natural antiseptic

**Classification:** Balsam fir sap is classified as MEDICINE by HEALTH CANADA in the NHP category (natural health product) listed under its Latin name: *Abies balsamea*

**Use:** It is mainly used for the care of the lungs and everything related to them; cough, asthma, bronchitis. You will certainly discover in a surprising way, in the descriptions below, all the potential that fir gum contains.

**Property:** It is antiseptic, antiviral, antifungal, antibacterial, oxygenating, anti-cancer, strengthens the immune system, energizing

Balsam fir resin is essentially made up of terpenes (monoterpenes, sesquiterpene, diterpenes). We present them to you in order of importance of quantity found in balsam fir resin.

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### *Monoterpenes*

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**Main properties:** General stimulant, "cortison-like" (analogous to cortisone) for some, air antiseptic, decongestant of the venous, respiratory and lymphatic systems, analgesic by skin contact, neurotonic.

### **Alpha-pinene :**

**Therapeutic effects:** Acute and chronic bronchitis, COPD, Osteoarthritis, joint disorders.

**Properties:** Mucolytic and expectorant, oxygenating respiratory, active in bronchitis, effective in acute bronchitis, antibacterial, anti-inflammatory, Cortisone-like, Thermogenic locally. Well absorbed through the skin, intestines, respiratory tract

## Beta-pinene :

**Therapeutic effects:** It is used as an adjunct to simple respiratory conditions: Bronchitis, Colds, Cough

**Properties:** Expectorant and mucolytic, antiviral, antifungal, antibacterial and anti-edematous

## Limonene :

**Therapeutic effects:** Expectorant, cholagogue. Protects against cancer of the skin, liver, breast and colon.

**Properties:** Antiseptic, antiviral, sedative and muscle relaxant, anxiolytic,

Lipid-lowering, dissolving gallstones (intra-biliary)

Anti-inflammatory, anti-inflammatory bronchial,

Potential action in chemoprevention and chemotherapy of cancers, detoxification of carcinogens by induction of phase I and phase II enzymes, Inducer of apoptosis, anti-angiogenic, anti-tumor, inhibits malignant cell growth.

Preventive of skin cancer, reduction of chemo-induction of hepatocellular carcinomas,

D-limonene has anticancer properties as it is called an emerging antineoplastic agent. Limonene induces apoptosis via mitochondrial death and the suppression of cell mediators.

Anti-ulcer, gastro-protective, increases the secretion of mucus.

Limonene is a potential inhibitor of protein glycation that can help improve secondary complications of diabetes.

## Beta-phellandrene :

**Therapeutic effects:** Cytotoxic on breast and pancreatic cancers

**Properties:** Antifungal, antibacterial,

## Myrcene :

**Analgesic:** Several studies indicate that myrcene has great analgesic potential. Its pain-relieving effect is favored by the release of endogenous opioids into the system thanks to the adrenergic receptor  $\alpha_2$ . In other words, it will help the body to produce pain relieving substances.

**Anti-inflammatory:** The anti-inflammatory effects of myrcene have been the subject of several scientific studies with promising results. These studies, mostly in rodents, indicate that myrcene is a powerful anti-inflammatory acting on the inhibition of prostaglandins.

**Improved immune functions:** Several studies claim that myrcene has immunoregulatory properties, since it inhibits the production of nitrogen oxide in immune cells (macrophages).

## Geraniol:

**Properties:** Antibacterial. Reduces the multiple resistance of *Enterobacter aerogenes*, *Escherichia coli*, *Pseudomonas aeruginosa* and *Acinetobacter baumannii*, significantly increases the effectiveness of beta-lactams, quinolones, and chloramphenicol by activity on efflux pumps.

Antifungal and anti-aspergillary

Active against *Candida* strains resistant to fluconazole, inhibition of *Candida* sp biofilms (with carvacrol, thymol).

Potentiates the effects of amphotericin B and ketoconazole on *Aspergillus* sp

Anthelmintic

Antioxidant, anti-inflammatory, anti-inflammatory action by increasing the production of IL-10, immunomodulating activity, improves the parameters of the metabolic syndrome in rats, potentiates the effectiveness of antidiabetics.

Spasmolytic, presumably by blocking calcium channels, inhibits contractions of the ileum.

Anti-hypertensive and anti-arrhythmic.

Antitumor potential, modulates DNA synthesis, potentiates the action of anticancer drugs (5-FU), chemopreventive against cancer

Interesting potential in pancreatic cancer.

Inhibits the growth of colon cancer cells, inhibits the biosynthesis of polyamines.

Inhibits the growth of melanomas and hepatomas.

Inhibits the progression of breast cancer cells.

Ligand for estrogen receptors with slightly estrogenic effect.

Potential anti-rejection agent.

Insecticide and repellent against insects, in particular *Aedes albopictus* (tiger mosquito).

Improves penetration of drugs transdermally.

### Citronellol:

#### Properties:

Calming, antiseptic, antiviral, tonic

Antifungal, potentiates the effects of amphotericin B and ketoconazole on *Aspergillus* (like geraniol)

Analgesic.

Spasmolytic, inhibits contractions of the ileum.

Anticonvulsant.

Potentiates the activity of GABA-A and increases its affinity towards its receptors.

Hypo-allergenic.

Immunomodulating, limits neutropenia and lymphopenia during anticancer chemotherapy.

Repellent activity against insects, repellent effect against ticks *Ixodes Rhipicephalus sanguineus* and *Amblyomma sculptum*.

Herbicidal activity by inhibition of mitosis

## Delta-3-carene

Properties: Antifungal against *Aspergillus*, antitussive and expectorant, antioxidant

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## *Sesquiterpenes*

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**Main properties:** Powerful anti-inflammatory, calming, sedative, spasmolytic, hypotensive. Several mechanisms have been highlighted: inhibition of the synthesis and release of inflammation mediators - leukotrienes, cytokines ( $\beta$ -caryophyllene,  $\alpha$ -humulene, patchoulene), platelet activating factor ( $\alpha$ -bulnesene), histamine (chamazulene) - antioxidant activity (chamazulene), action on cannabinoid receptors ( $\beta$ -caryophyllene). Calming and spasmolytic important.

Venous and lymphatic decongestants. Anti-allergic. Hypotensive. Special properties: chamazulene is antihistamine and antipruritic.

## Longifolene :

Properties: anti-inflammatory, antiseptic

## Beta-bisabolene :

Properties: In the treatment of breast cancer, has specific cytotoxicity to human mammary tumor cells.

## Beta-elemene:

Properties: anticancer, induces the activity of caspase-3, -7, -9, decreases the expression of Bcl-2, causes the release of cytochrome c and increases the concentration of caspase-9 and poly (ADP-ribose) polymerase (in bronchial and fibroblastic epithelial NSCLC cells of the tongue), inhibits the proliferation of cis-platinum-resistant ovarian cancer cells, strong synergy with cis-platinum, inducer of apoptosis, acts in leukemias

and solid tumors, lung cancer (NSCLC), H460 and A549 cell lines, in synergy with cis-platinum, prostate cancer, antitumor in lung and colon cancers.

### Alpha-humulene:

Therapeutic effects: Breast, lung, colon, skin cancer

Properties: Anti-inflammatory, alpha-humulene and trans-caryophyllene inhibit LPS-induced activation of NF-kappaB and migration of neutrophils. Antitumor.

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### *Diterpenes*

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### Abietic acid

Properties: Anti-inflammatory, inhibits the production of prostaglandin E2 (PGE2) in macrophages.

### Neo-abietic acid

Properties: unknown

### Dehydroabietic acid

Properties: unknown

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