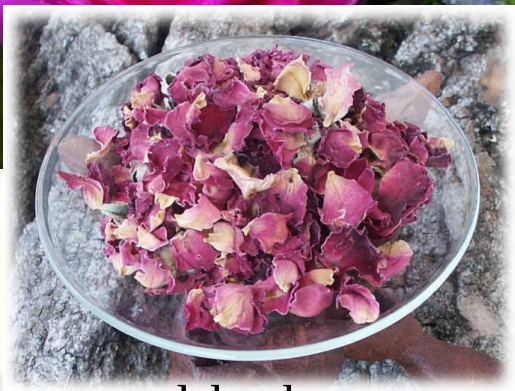


Description of medicinal plants and medicinal herbal raw materials containing volatile oils

Rose flowers - *Flos Rosae*

Red Rose, French Rose, Provins Rose - *Rosa gallica L.*

Family *Rosaceae*

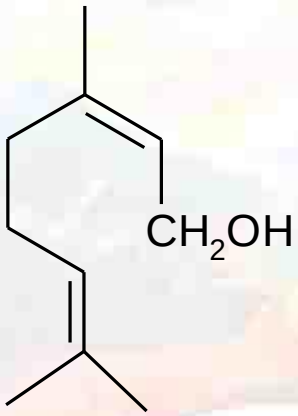


A shrub attaining the height of 1 to 1.5 m. It is branched and has prickles, alternate, imparipinnate leaves, each having 3-5 broadly elliptic leaflets which are obtuse at apex, cordate at base and glandular-serrate along the margin. The flowers are large, usually double, with velvety, purplish-red petals and very fragrant. The fruit is an orange-red, oblong hip containing achenes.

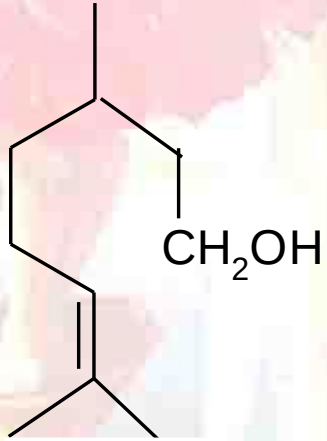
The raw material consists of a mixture of separate and broken petals and entire cones of numerous imbricated petals. Petals broadly ovate, summit retuse, margin entire and somewhat recurved, base obtuse, externally of a purplish-red to weak red colour in upper part, yellowish-brown to yellowish-orange in the claw; texture velvety; when dry brittle; odour rose-like; taste astringent and slightly bitter.



- ***Chemical composition***
- **Volatile oil :** heranial (50-60%), citronellal (25-30), neral (10%), phenylethylyc alcohol, cinnamon aldehyde**;**
- **alkanes,**
- **tannins**



heranial



citronellal

Use in medicine

Volatile oil, „Rosanol”, infusion of petals produce spasmolytic, anti inflammatory, analgesic and antiseptic affect in treating cholelithiasis and nephrolithiasis. Volatile oil is used in perfumery.

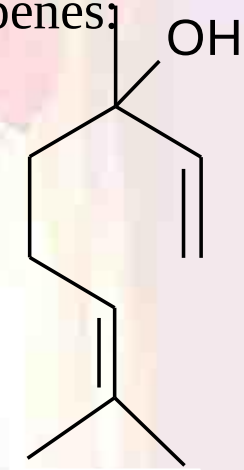


Coriander fruit - *Fructus Coriandri*
Coriander - *Coriandrum sativum*
Family - *Apiaceae (Umbelliferae)*

Coriander is an annual herbaceous plant about 70 cm high. Its stem is naked, thin - furrowed, hollow. The plant has both radical and cauline leaves. Radical leaves have a long petiole and incisely - serrated margin. They are tripartite. Cauline leaves are short - petiolate or sessile, pinattely parted with linear lobes. Inflorescence is a compound umbel with 3-5 rays. Flowers are white or pinkish, small. Fruit is cremocarp. The unmatured plant has a mousey, unpleasant odour. While ripening the fruits get pleasant aromatic odour.

The drug usually consists of the whole cremocarps, which, when ripe are about 2-4 mm in diameter. Each cremocarp consists of two hemispherical mericarps, united by their margins. The apex bears two divergent styles. The ten primary ridges are wavy and inconspicuous: there are 12 more prominent, secondary ridges. The fruits have a straw - yellow colour, an aromatic odour and a spicy taste.

- ***Chemical composition***
- **Volatile oil :** geranial , citronellal, linalool (coriandrol) (65-70%), menton, sesquiterpenes: germacron;
- **flavonoids,**
- **tannins,**
- **phenolic acids**



linalool

Use in medicine

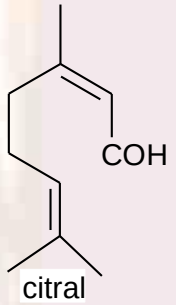
Coriander **is used to improve the function of gastro-intestinal tract, it is also bile-expelling, antihemorrhoidal, carminative, antiseptic, analgesic. Coriander fruits are also used for improving taste, odour of drugs (it is a flavouring agent).**

"Espol", "Citral"- **antimicrobial.**

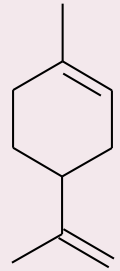
Lemon peel - *Exocarpium Citri*
Lemon - *Citrus limon*
Family - *Rutaceae*

Chemical composition

- **Volatile oil :(0,6%):** limonene, citral, citronellal, geranyl acetate;
- **flavonoids glycosides:** hesperidin, eriocitrin, neohesperidin,
- **coumarins,**
- **steroids:** sitosterol,
- **organic acids:** citric acid,
- **sugars,**
- **vitamins:** C, B_1, B_2, carotin
- **salt K, Cu**



citral


limonene

Use in medicine

Lemon is a source of volatile oil (*Oleum Citri*). The oil is used in perfumery and to improve the smell of medicines. *"Citral"* has antimicrobial activity. Lemon peel is used for producing vitamin P (citrine). Dry peel – bitterspicy stomachic.

Common balm herb - *Herba Melissae*
Common balm leaf - *Folium Melissae*
Common balm - *Melissa officinalis*
Family - *Lamiaceae (Labiatae)*

Common balm - is a perennial herbaceous plant about 30-80 cm high.The plant has straight, 4 - edged greatly branching stem. Leaves are opposite. The lower leaves are long - petiolate, cordate or ovate in shape; margins are crenate - serrate. The upper leaves are shortly - petiolate, oblong in shape and have a dentate margin. The stems and leaves are almost naked. Flowers are small, sessile, arranged in verticillasters, containing 6-10 flowers and located in axils of upper leaves. Calyx is bilabiate. Corolla is a white, pentapetalous, bilabiate. Fruit is a dry multicoccus breaking up to 4 coccuses.

Leaves are long-petiolate, up to 8 cm long and 3 cm wide. They have broadly ovate, and rounded or almost cordate base. The lamina has a dark-green upper surface which is slightly pubescent and a lighter green lower surface which is almost glabrous or only slightly pubescent along the veins and finely punctate. The margin is irregularly crenate or serrate and the venation is thin and prominent on the lower surface. The odour is aromatic, spicy, and like lemon; the taste is pleasantly spicy.



Chemical composition

- **Volatile oil (0,8-1,6%):** citral (upper 60%), linalool, geranial, citronellal;
- **flavonoids:** rutin,
- **tannins,**
- **cinnamic acids:** caffeic acid,
- **triterpenic acids:** oleonolic, ursolic

citral

Use in medicine

Infusion has a sedative, anti-inflammatory and bacteriostatic action. Crushed fresh leaves (for external use) can be used to treat injury, abscess, edemas.

Lavender flowers - *Flores Lavandulae*

Lavender - *Lavandula angustifolia*

Family - *Lamiaceae (Labiatae)*

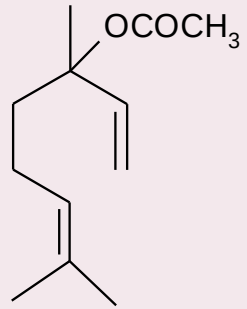
Lavender is an evergreen under - bush of 30-60 cm high. The leaves are sessile, opposite and oblong - linear in shape, 6 cm long. The margins of leaves are curved inwardly. The leaves are pubescent. Flowers are arranged in verticillasters of 7-10. The inflorescence is a spike. The calyx is tubular, violet or bluish grey colour; covered in abundance with stellata hairs and glands. Corolla is bilabiate, bluish violet and it is also greatly pubescent.

The drug is represented by the inflorescences, consisting of flowers, arranged in false whorls. Because, the petals readily fall off during the drying process, the drug consists mainly of the tubular-ovoid, ribbed, bluish grey calices; these have five teeth, four of which are short, while the fifth one forms an oval or cordate projecting lip. The petals are fused in to a tube with a lower lip, consisting of three small lobes and an upper lip comprising two larger erect lobes; the colour varies from deep bluish grey to a discoloured brown. Inside the corolla, there are four stamens and the superior ovary. The odour is intense with a pleasant and aromatic scent; the taste is bitter.



Chemical composition

linalool



linalyl acetate

- **Volatile oil (1,2%):** esters of linalol with acetic (до 50%), linalool (до 45%), geraniol , neral, 1,8-cineal, borneal,
- **coumarins,**
- **triterpenic acids:** ursolic
- **tannins,**
- **antocians,**
- **sugars, wax,**
- **mineral salts.**

Use in medicine

Infusion has a sedative, spasmolytic, carminative action; Lavender oil (for external use) has an antiseptic action and can be rubbed in skin to treat neuralgia; *"Livian"* – anti-inflammatory, anaesthetic. Lavender oil also used as an insecticide.

Peppermint leaf - *Folia Menthae piperitae*

Peppermint - *Mentha piperita*

Family – *Lamiaceae (Labiatae)*

Peppermint - is a cultivated perennial herbaceous plant about 100 cm high. The plant has creeping rhizomes. The stem is upright, branchy, 4 - edged, naked or with rare short appressed hairs. The leaf blades are 3 - 9 cm long and have a grooved petiole, up to 1 cm in length. They are opposite, oblong - ovate in shape: acuminate at the apex and cordate at the base. They have sharply dentate margin.

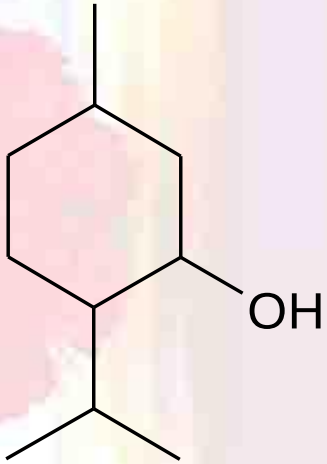
The flowers are small, arranged in verticillasters and located on the top of shoots. The inflorescence is a spike. Corolla is bilabiate, pinkish or pale - violet in colour. The fruit consists of nutlets.

The leaf is entire, broken or cut, thin, fragile; the entire leaf is 3 cm to 9 cm long and 1 cm to 3 cm wide and often crumpled. The lamina is oval or lanceolate, the apex acuminate, the margin sharply dentate and the base asymmetrical. Venation is pinnate, prominent on the lower surface, with lateral veins leaving the midrib at about 45°. The lower surface is slightly pubescent and secretory trichomes are visible under a lens, as bright yellowish points. The petiole is grooved, usually up to 1 mm in diameter and 0.5 cm to 1 cm long. Peppermint leaf has a characteristic and penetrating odour and a characteristic aromatic taste (the taste is burning). When chewing leaves the constituents leave the feeling of cold in the mouth.



Chemical composition

- **Volatile oil:** menthol, menthone, peperitone, metilacetat,
- **flavonoids,**
- **coumarins,**
- **saponins,**
- **tannins.**



mentol

Use in medicine

Volatile oil, menthol, gastric drops, infusion, tincture – raise secretion of digestive glands produce a choleretic, spasmolytic, sedative action; *Corvaldin, Corvalol, Validol, Valokormid,* Zelenin's drops - spasmolytic, hypotensive, sedative, analgesic; *Ingalipt, Cameton, Camphomen* - anti-inflammatory, antiseptic; *Mint tablets* – anti-nausea; *liniment Bom-benge, Boromentol, Gevcamen, Menovazin,* - revulsive, analgesic, anti-inflammatory.

Sage leaf - *Folia Salviae*
Sage - *Salvia officinalis*
Family – *Lamiaceae (Labiatae)*

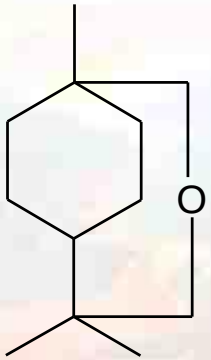
Sage - is an evergreen under-shrub about 50 cm of height. The stems are numerous, many branched, 4 - edged, finely - downy, densely - leaved, woody at the base, grey - green in colour. The leaves are sessile, petiolate, oval or lanceolate in shape, grey - green in colour with a velvety surface. They have obtuse apex, cordate base and crenate margin. Flowers are arranged in verticillasters of 6 to 8. The inflorescence is a loose spike. Calyx is bilabiate downy. Carolla is bilabiate, blue - violet. Fruits are small, black - brown nutlets.

Leaves are petiolate, oval or lanceolate in shape. They have obtuse apex, cordate base and crenate margin. At the base of blade there are one or two oblong lobes ("auricles"). The surface of the leaves is velvety. The leaves are densely tomentose on both surfaces, more on the lower surface than on the upper. The leaves are grey - green in colour, finely downy. The odour is strong, aromatic, spicy and on rubbing clearly reminiscent of eucalyptus oil (high cineol content!). The taste is aromatic, spicy, somewhat bitter, and slightly astringent.

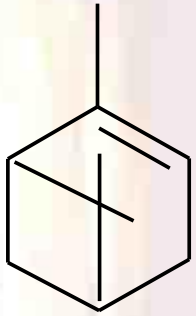


Chemical composition

• **Volatile oil:** 1,8-cineole (eucalyptol), pinene,
camphor, α-, β-tuon, borneol,
• **tannins,**
• **triterpenic acids:** oleonolic, ursolic



1,8 - cineole (eucalyptol)



pinene

Use in medicine

Volatile oil, infusion - anti-inflammatory, antimicrobial, estrogenic, expectorant, astringent, hypoglycemic,
***Salvin* - anti-inflammatory, antimicrobial.**



Gum-tree leaf - *Folia Eucalypti* ***monocyclic monoterpens***

Gum - tree, Blue gum, Fever tree - *Eucalyptus globules Lab., Eucalyptus fructicetorum F. von Mueller (Eucalyptus polybractea R.T. Baker) and Eucalyptus smithii R.T. Baker*

Family - *Myrtaceae*

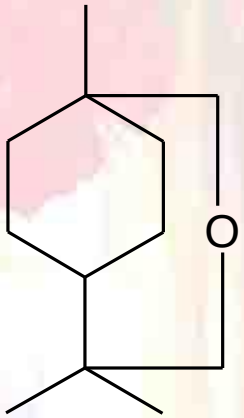
Gum-tree - is a high evergreen tree up to 100 m with smooth greyish bark, whose periderm breaks off in layers and hangs as long tapes. Geterophilia is typical phenomena for gum-tree: the thing is that eucalyptus trees possess two kinds of leaves: those on young plants being cordate or ovate in shape, sessile, soft, blue - grey, covered with a layer of wax; while those on mature trees are short - petiolate, alternate, oblong or narrow - lanceolate in shape, leather - like. Flowers are sessile, in axillary umbels. Fruit is 4-edged boll.

The drug consists only of the matur leaves and notthe oval juvenile ones. The more or less similar-shaped, thick, grey – green, petiolate leaves up to the 25 cm long, with the midrib clearly visible particualy on the lower surface. Leaves are entire, naked; their surface is covered with brown spots of corked tissue. The are grey - green in colour and sometimes with reddish - violet shade. The odour is strongly aromatic, especially on rubbing, reminiscent of camphor. The taste is spicy – somewhat bitter, astringent.



Chemical composition

• **Volatile oil:** 1,8-cineole, *n*-cimene, α-, β-pinene;
• **flavonoids:** rutin;
• **tannins.**



1,8 - cineole (eucalyptol)

Use in medicine

Volatile oil - bactericidal; ***infusion, tincture, Ephcamon, Gevcamen, Alorom, Cameton, Ingalipt, Pektussin, tea***
***Elecosol* - bactericidal, anti-inflammatory, astringent;**
***Khlorophillipt* – antistaphylococcal.**

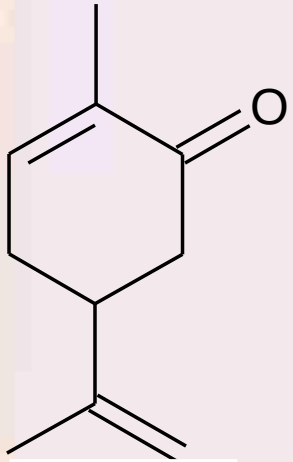
Caraway Fruit - *Fructus Carvi*
Caraway - *Carum carvi*
Family - *Apiaceae*

Caraway is a biennial herb about 1m high. The stem is upright, branchy. The leaves are alternate, petiolate, decreasing in size to the top of the stem. At the base leaves are widening into sheathes. The blade of the leaf is twice or three times pinnately sected into linear - lanceolate lobes. Inflorescence is a compound umbel. The flowers are small, white. Fruit is a cremocarp.

The drug usually consists of mericarps separated from the pedicel (double achenes). The fruit are slightly curved, brown and glabrous about 4 - 7 mm long, 1 - 2 mm wide tapered at both ends. They are crowned with a stylopod often with style and stigma attached. Each maricarp shows fine almost equal sides, five narrow primary ridges. The odour is strong, aromatic. The taste is aromatic and spicy.

Chemical composition

- **Volatile oil(3-7%):** carvone, limonene, carvacrol;
- **tannins,**
- **fat oil 15%,**
- **proteins,**
- **flavonoids:** quercetin, qempferol,
- **coumarins:** umbellipherone



carvone

Use in medicine

Volatile oil, infusion - antimicrobial, spasmolytic, expectorant, choleretic, carminative is used for improving lactation.

Rhizoma cum radicibus Valerianae - *Rhizomata cum radicibus Valerianae*

Valerian, Cat's Valerian - *Valeriana officinalis*

Family - *Valerianaceae*

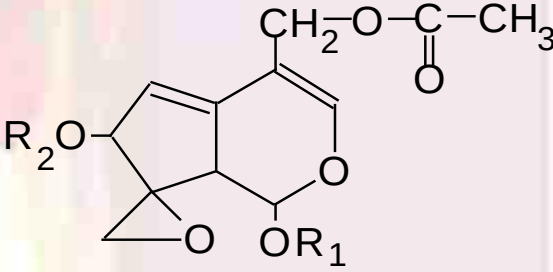
A tall perennial herb whose underground portion consists of a vertical rhizome bearing numerous rootlets and one or more stolons. The aerial portion consists of a cylindrical, hollow, channeled stem, branched in the terminal region, bearing opposite exstipulate, pinnatisect, cauline leaves with clasping petioles. The inflorescences consist of racemes of cymes whose flowers are small, white or pink. The fruits are oblong-ovate, 4-ridged. 1-seeded akenes.

The rhizome is obconical to cylindrical, up to 50 mm long and up to 30 mm in diameter; the base is elongated or compressed, usually entirely covered by numerous roots. The apex usually exhibits a cup-shaped scar from the aerial parts; stem bases are rarely present. In longitudinal section, the pith exhibits a central cavity transversed by septa. The roots are numerous, almost cylindrical, of the same colour as the rhizome, 1 mm to 3 mm in diameter and sometimes more than 100 mm long. A few filiform fragile secondary roots are present. The fracture is short. The stolons show prominent nodes separated by longitudinally striated internodes, each 20 mm to 50 mm long, with a fibrous fracture. The odor is characteristically valeric acid like, becoming stronger on ageing. The taste sweetish, camphoraceous and somewhat bitter.

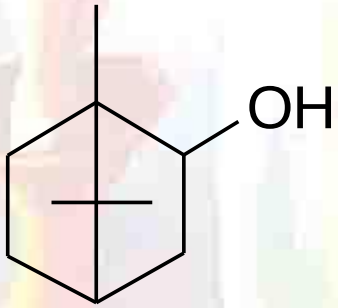


Chemical composition

• **Volatile oil(до 2%):** bornlisovalerianate, bornyl formiate, bornyl acetate and bornyl hutyrale, camphene, borneol and pinene;
• **alkoloids:** chalinine and valerianine,
• **iridoids-valepatriats:** valtrate, isovaltrate, acevaltrate,
• **phenolic acids:** caffeic acid, chlorogenic acid,
• **flavonoids**



valepatriate



borneol

Use in medicine

Infusion, liquid extract, extract in tablets, tincture, Cardiophit, Valocormid, Cardiovalen, drops **- sedative, spasmolytic, analgesic, stomachic medicine.**

Fruits Juniper, Juniper berries, Horse Savin Berries - *Fructus Juniperi*

Juniper - *Juniperus communis*

Family - *Cupressaceae*

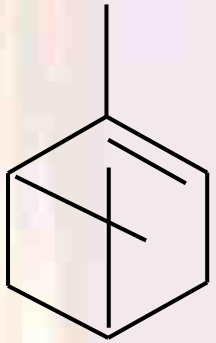
Juniperus communis is a low evergreen tree or erect shrub, sometimes attaining a height of 9 m., having thin, straight, long, acerose leaves, white glaucous on the lower surface, arranged in whorls of 3, and dioecious flowers. The carpellate cones are ovoid and consist of 3 fleshy scales, each one-ovuled. The fruit is a subglobose galbulus 5 to 8 mm. in diameter, which contains 3 seeds. The variety *depressa* Pursh or Low Juniper is a decumbent or depressed shrub usually up to about 3 ft. high, forming circular mats. Its leaves have a white stripe beneath and its fruit is a blue galbulus up to 10 mm. in diameter.

Subglobular, 5 to 10 mm. in diameter, externally smooth, shining, purplish black to red purple, occasionally reddish brown or sometimes, usually covered with a blue-grey bloom; at the summit a 3-rayed furrow marks the cohesion of the three fleshy bracts forming the pericarp; internally exhibiting a yellowish brown to dusky yellow flesh containing many large schizogenous cavities; seeds usually 3, triangular ovate, hard, brown, on the surface of which are large uneven oil glands; odour aromatic upon crushing; taste sweet, pleasant, terebirithinate, slightly bitter.



Chemical composition

• **Volatile oil (до 2,5%):** α-pinene, camphene, sabinene, isobarneale, terpenene, phelandrene, limonene, cadinene, bornilacetat;
• **sugars (upper 40%)**
• **pectins**
• **gums,**
• **organic acids**
• **flavonoids**
• **tannins**



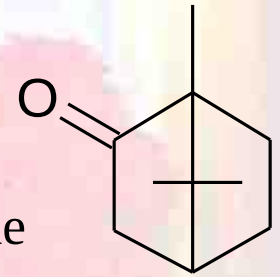
pinen

Use in medicine

Volatile oil, infusion - diuretic, disinfect , choleretic, expectorant. Fruits - expectorant for diseases of upper airways.

Camphor is a ketone obtained from Cinnamomum camphora (natural camphor)

Camphor is a strong-smelling white substance used in various medicines. It is prepared from the wood by distillation in steam.



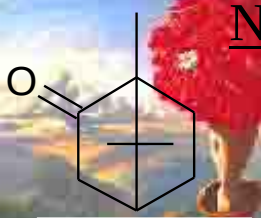
(+)-camphora

Camphor tree wood- *Lignum Cinnamomi*

Camphor tree- *Cinnamomum camphora*

Fam. – *Lauraceae*

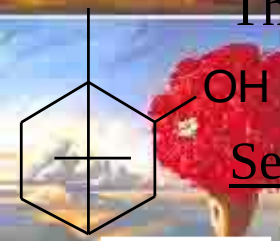
The plant is a large evergreen tree indigenous to eastern Asia but naturalized in the Mediterranean region, Sri Lanka, Egypt, South Africa, Brazil, Jamaica, Florida, and California. From 1900 until World War II, about 80% of the world's supply of natural camphor (about 4 million kg per year) was produced in Taiwan, where the tree occurs naturally in abundance and is also extensively cultivated.



(+)-камфора

Natural camphor occurs as a crystalline product in clefts in the woody stems and roots and, to a greater extent, dissolved in the volatile oil. The wood is chipped and distilled with steam, and 1 lb (453,6g) of crude camphor is obtained from 20 to 40 lb of chips. The crude camphor is then freed of oil by centrifugation and pressing and finally re-sublimed and pressed into the familiar cakes.

The specific rotation of natural camphor is between +41° and +43°.



борнеол

Semisynthetic camphor (**(-)-isomer**) is made from borneol, obtained from fir tree.

Synthetic camphor is made from pinene, the principal constituent of turpentine oil. Synthetic camphor is the optically inactive **racemic** form.

α-пинен

A number of complex methods have been used for producing synthetic camphor, but all are based on (1) converting pinene into bornyl esters, which are (2) hydrolyzed to isoborneol, and (3) finally oxidized to camphor.

USES

Camphor (natural camphor only) **oil solution for injection – ANALEPTIC,**

Camphor is a topical antipruritic, rubefacient, and anti-infective

Source of semisynthetic camphor

Fir twig- *Summitates Abietis*

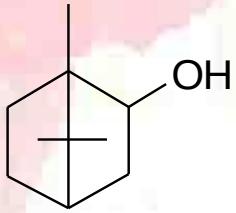
Fir tree **- *Abies sibirica***

Fam. – *Pinaceae*

Fir tree is an evergreen coniferous tree with upright cones and flat needle-shaped leaves, typically arranged in two rows. Firs are an important source of timber and resins.

Act const.

- essential oil (2,5-3%): borneolacetate, borneol, camphen, α-, β-pinene,
- resines



borneol

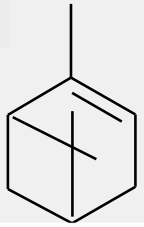
Source of synthetic camphor

Pine tree - *Pinus sylvestris*

Fam. *Pinaceae*

Act const.

α-pinene, β-pinene,



α-pinen