VOLATILE OILS

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LEMON PEEL

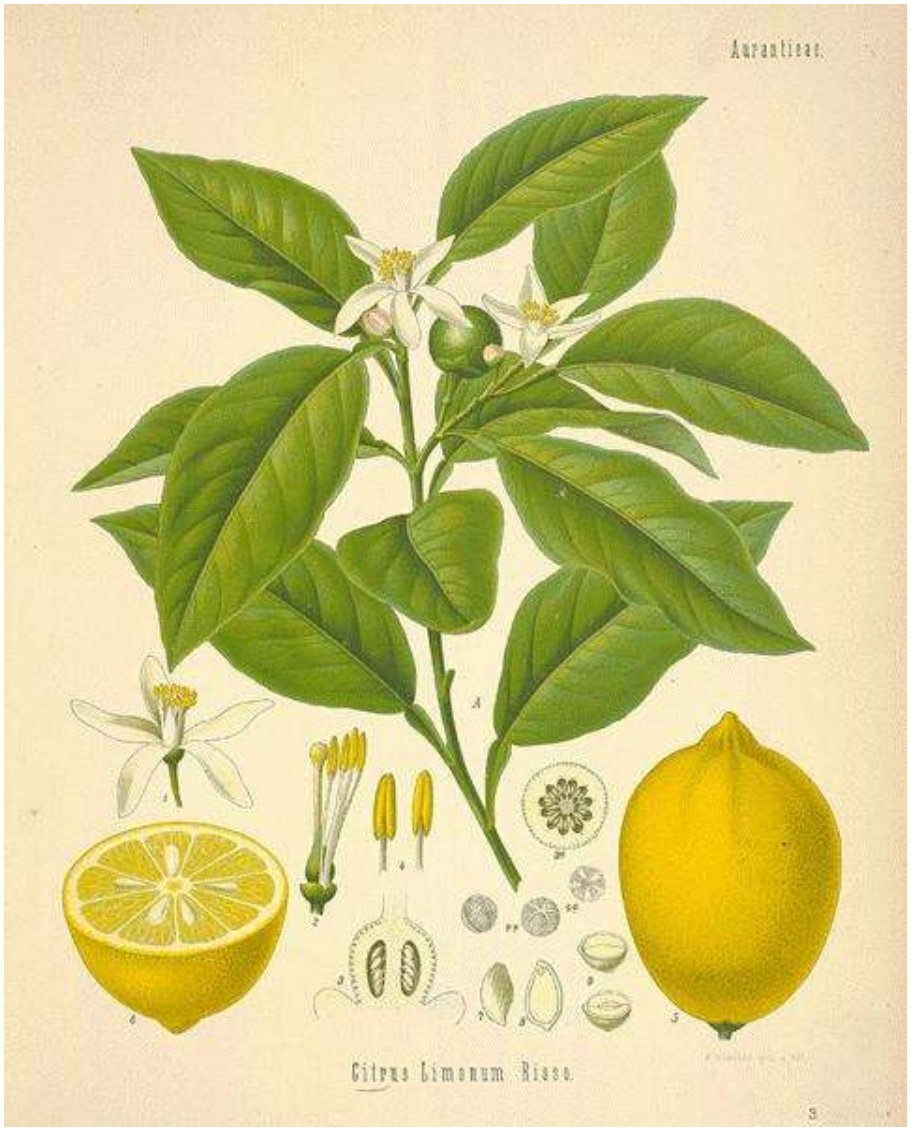
Definition: Dried lemon (*Limonis Cortex*) peel is obtained from the fruit of *Citrus limon* (Rutaceae).

Botanical Description:

Small tree, growing to 3-5 m in height.

Geographical Sources

Mediterranean Regions



Limonis Cortex – COLLECTION & PREPARATION

Lemons are collected in January, August & November, before the green colour changes to yellow.

The smaller fruit, which would not be sold on the produce market, are used in the preparation of oil of lemon - the peel is removed with a sharp knife in the form of a spiral band.

Limonis Cortex – CHARACTERISTICS

Dried lemon peel occurs in spiral bands (2 cm wide; 2-3 mm thick).

The **outer** surface is rough & yellow; the **inner** surface is pulpy & white (anatomically similar to that of an orange peel).

Odour: Strong & characteristic

Taste: aromatic & bitter

Limonis Cortex – CONSTITUENTS & USES

CONSTITUENTS

Should contain at least 2.5% volatile oil

Vitamin C

Hesperidin (Flavonoid)

Mucilage

Calcium Oxalate

USES

Flavouring purposes

LEMON OILS - *Oleum limonis*

Definition: Lemon oil is the oil expressed from the outer part of the fresh pericarp of the ripe or nearly ripe fruit of *Citrus limon* (Rutaceae).

BP: oil should be obtained by suitable mechanical means, without the use of heat, from the fresh peel.

Much oil is derived via **steam distillation**, but this process yields oil of **inferior quality**.

Distilled oil of lemon is much cheaper than that prepared by expression. Large amounts are used for non-pharmaceutical purposes.

Geographical Sources:

Mediterranean, North & South America, Australia & parts of Africa.

Preparation of Lemon Oils

i. **Hand Methods**

No longer applicable to pharmaceutical oils

Production of Lemon Oils

ii. Machine Processes

Quality is inferior to the best hand-pressed oils.

Machines are designed to release oils from the peel via puncture, rasting or cutting and by imitating the gentle squeezing action of the sponge method. (Superiority of the sponge method is due to the fact that there is no contact between the oil & the inner white part of the skin.

The newer machines extract oil more completely than the older ones and give a higher yeild

iii. Distilled Oils

Although not official, some lemon oils are produced by distillation, mainly from the residue of the expression processes. It is much cheaper than hand-pressed or machine-made oil.

Oleum limonis - CONSTITUENTS

Terpenes – mainly limonene

Sesquiterpenes

Aldehydes (Citral & Citronella)

Esters

Lemon oil has a tendency to **resinify** and should be protected from the action of air & light as much as possible.

Oleum limonis – ADULTERATION & USES

ADULTERATION

Oil of turpentine

Terpenes from ‘terpeneless oil lemon’

Distilled oil of lemon

Oil of lemon-grass

USES

Perfumery

Flavouring

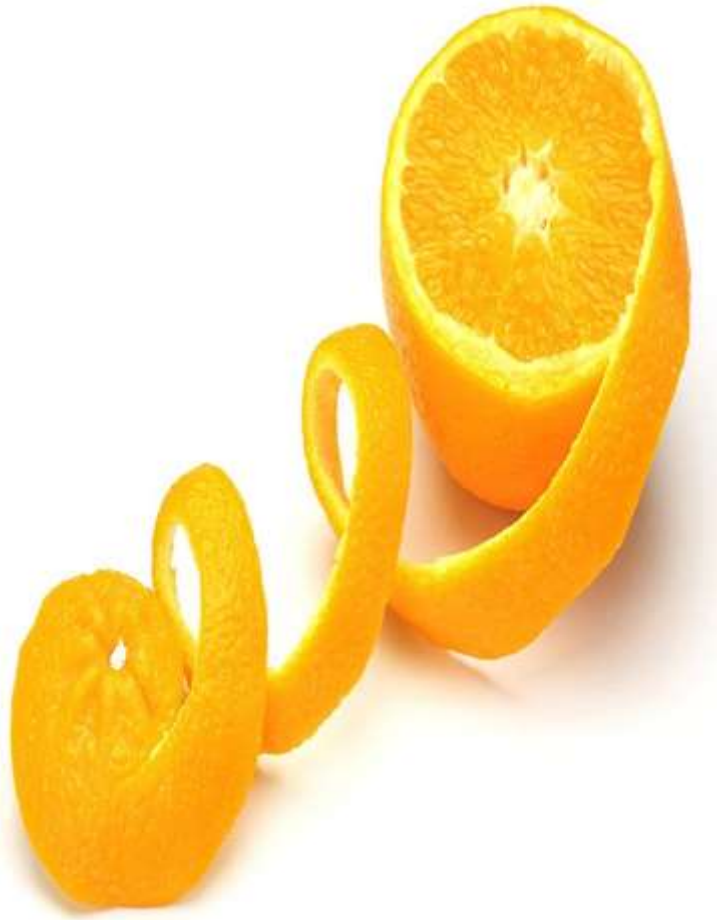
TERPENELESS LEMON OIL

Definition: Oil prepared by concentrating lemon oil in vacuum until most of the terpenes have been removed, or by solvent partition. The concentrate is a terpeneless oil, which has a citral content of 40-50 %.

It is equal in flavouring to 10-15 times its volume of lemon oil

BITTER ORANGE PEEL

Definition: Dried bitter orange peel is obtained from the fruit of *Citrus aurantii* (Rutaceae).



Botanical Description:

Small tree, growing to 3-5 m in height.

Geographical Sources

Mediterranean Regions

Definition: Bitter orange peel oil is the oil expressed from the outer part of the fresh pericarp of the ripe or nearly ripe fruit of *Citrus aurantiii* (Rutaceae).

BP: oil should be obtained by suitable mechanical means, without the use of heat, from the fresh peel.

Much oil is derived via **steam distillation**, but this process yields oil of **inferior quality**.

Distilled oil of lemon is much cheaper than that prepared by expression. Large amounts are used for non-pharmaceutical purposes.

Geographical Sources:

Mediterranean, North & South America, Australia & parts of Africa.

Bitter orange peel
CONSTITUENTS & USES

CONSTITUENTS

Should contain at least 2.5% volatile oil

Vitamin C

Hesperidin (Flavonoid)

Mucilage

Calcium Oxalate

Volatile oil consits of Limonene and traces of citral.

USES

Flavouring purposes

EUCALYPTUS LEAF

DEFINTION: Eucalyptus leaf consists of the whole or cut dried leaves of the older branches of *Eucalyptus globulus*, (Myrtaceae).

GEOGRAPHICAL SOURCES

Portugal, SA, Spain, China, Brazil, Australia, India & Paraguay.

Eucalyptus - DESCRIPTION

MACROSCOPICAL

- Older dried leaves are grey-brown & have lateral veins. Secretory oil cells are visible in leaves held to the light.

MICROSCOPIC

- Epidermal cells have a thick cuticle.
- Anisocytic stomata
- Mesophyll has schizogenous oil glands
- Calcium oxalate crystals: Prisms & Cluster crystals

Eucalyptus - CONSTITUENTS

Volatile Oil (at least 2 %)

sesquiterpene - Anti-bacterial action against oral pathogens.

EUCALYPTUS OIL

Oil of eucalyptus is distilled from the fresh leaves of various species of *Eucalyptus* and rectified. They are produced in the same countries which produce the dry herb.

Only a certain amount of species produce oil suitable for medicinal use – the main criteria is a **high cineole** content and **low** amounts of **phellandrene and aldehydes.**

Suitable oils are obtained from *E. polybractea, E. smithii,* ***E. globulus*** and ***E. australiana*****.**

CHARACTERISTICS & CONSTITUENTS

CHARACTERISTICS

Colourless or pale yellow liquid

Aromatic & camphoraceous in odour.

Pungent & camphoraceous in taste, which is followed by a sensation of cold.

CONSTITUENTS

At least 70 volatile oils (mainly cineole).

EUCALYPTUS OIL - USES

Alleviating the symptoms of nasopharyngeal infections

Treating coughs

Decongestant.

Official preparations

Mixtures, inhalations, lozenges and pastilles; also applied externally as ointments and liniments.

PEPPERMINT
& PEPPERMINT OIL

DEFINITION: Peppermint is the dried leaves of *Mentha piperita* (Labiate). It should contain at least 1.2 % volatile oil.

GEOGRAPHICAL SOURCES:

Europe & America

MACROSCOPICAL FEATURES

All mints have a square stem & creeping rhizome.

Black mint, which is the most commonly cultivated variety in England, has purple stems and dark green petiolate leaves tinged with purple. Leaf blades are 3-9 cm long with a grooved petiolate up to 1 cm long.

Pinnate venation.

Glandular trichomes: bright yellow points (hand lens)

Small purple flowers appear in late summer.

MICROSCOPIC FEATURES

Diacytic stomata

Multicellular clothing trichomes

2 types of glandular trichomes (one with a unicellar head; with a multicellular head).

Calcium oxalate is absent.

Oleum Menthae

Oil of peppermint is obtained from *Mentha piperita* via steam distillation using the flowering tops.

Oil should contain at least 44 % menthol, 15-32 & menthone and 4.5-10 % menthyl acetate.

Oleum Menthae - CONSTITUENTS

Menthol
Menthone & isomenthone
Menthyl acetate
Limonene
Cineole
Menthofuran
Pulegone
Cineole

OIL COMPOSITION: greatly influenced by genetic factors & seasonal variation.

PEPPERMINT & PEPPERMINT OIL USES

OIL: anti-bacterial, cooling, carminative

HERB: Carminative

SANDALWOOD OIL

SYNONYM-

Yellow sandalwood , Chandan oil

BIOLOGICAL SOURCE-

It is dried heartwood of *Santalum album* (SANTALACEAE).

PREPARATION-

30 year old plant selected for collection of volatile oil. Plant is uprooted , bark is removed from stem and root. Wood is cut into small pieces for steam distillation.

Oil is yellowish or pale reddish viscous liquid, strong fragrance, bitter taste.

CHEMICAL CONSTITUENTS-

Alfa & beta santalol(90)
Alfa & beta santalene, Alfa & beta santalic acid
Santalone
Santanone, santene

Chemical and Therapeutic properties

- The main chemical components are santalol, santyl acetate and santalene. Our essential oil contains 90% santalol.

- The therapeutic properties of sandalwood oil are antiphlogistic, antiseptic, antispasmodic, astringent, carminative, diuretic, emollient, expectorant, sedative and tonic.

OIL OF CITRONELLA

CITRONELLA

- Citronella oil is an essential oil containing citronellal, geraniol and hydroxy citronellol and other high value perfumery bases obtained on steam distillation of citronella grass
- 5-6 harvests can be taken per year at 2 months intervals
- Oil yield is around 150 kg/acre/year

USES

- Insect/ Mosquito repellent
- Used in hair oils
- Used in preparation of soaps and brilliantines