

# Flos Matricariae

- *Matricaria recutita* (*Chamomilla recutita*, *M. chamomilla*) (Compositae/**Asteraceae**) dried capitulum.
- Mainly grows in Europe, also cultivated.
- Widespread in Anatolia. It's called as "Mayıs papatyası" or "Adi papatya" in Turkey.
- Official daisy is this one.

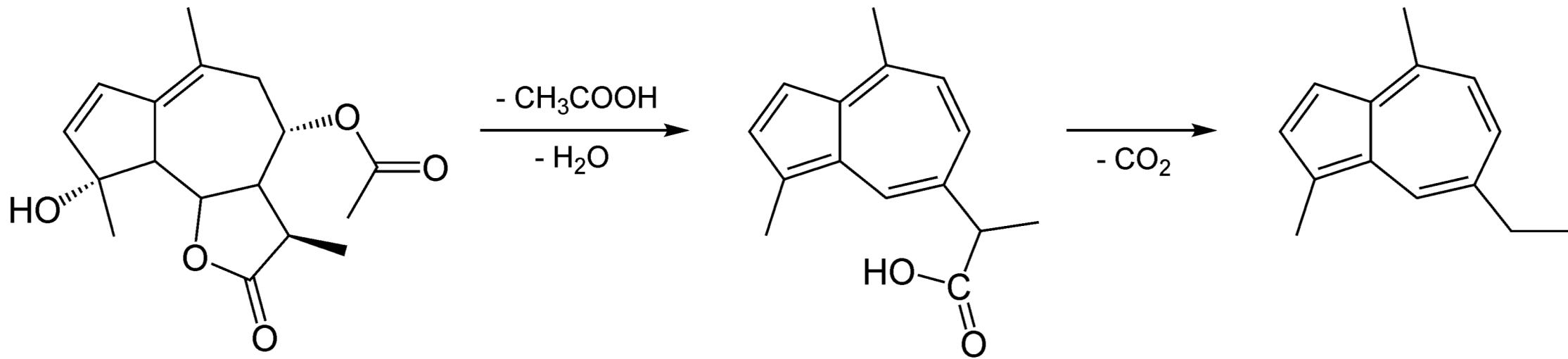


- *Matricaria chamomilla*, 20 - 50 cm height, annual, herbaceous plant. Flowering time is May. Capitulum has 5 - 10 mm diameter. Ligulate flowers are white, corolla on the top, three parted, 15 to 20. Tubular flowers are hermaphrodite, yellow and five parts, too many in the middle. Fruits achene.



- Essential oil yield is 0,3-1.5% with a blue-green colour.
- Sesquiterpene compounds are important constituent of oil. 1-15% of oil is chamazulene.
- Chamazulene is a bicyclic, non-oxygenated, sesquiterpenic structure.
- Chamazulene is a decomposition product of matrisin (a colourless proazulen). Bisabolole which is a monocyclic, unsaturated sesquiterpenoid is another important constituent.
- Up to 50% of essential oil is sesquiterpenoids.
- Moreover, coumarins, flavonoids and phenolics are the other compounds of *M. chamomilla*.

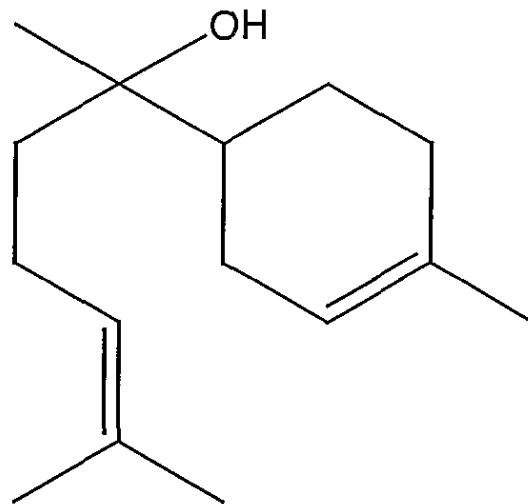




Matricin

Chamazulenenic acid

Chamazulene



$\alpha$ -bisabolol

- *M. recutita* and *M. macrotis* are growing in Anatolia.
- Due to chamazulene and alpha-bisabolole drug has antiinflammatory activity.
- Essential oil is antiseptic and antimicrobial, choloretic and hypotansive.
- It has also sedative effect.
- Used orally for GI problems.
- Topically used for inflammatory skin diseases.
- Could be irritant due to sesquiterpenoids.

# Flos Chamomillae romanae

- *Chamaemelum nobile* (*Anthemis nobilis*) (Asteraceae)
- Dried capitulum.
- Cultivated in West and Central Europe.
- Perennial plant. Flowering time is from July to September.

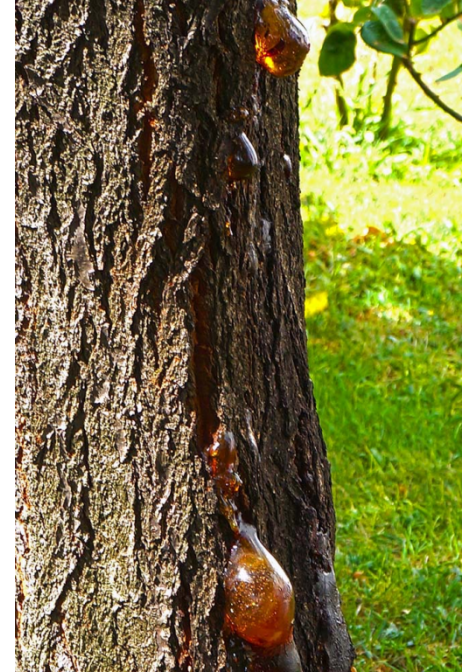




- Essential oil yield is 0,4-1,5% with a blue-green colour. Essential oil composition is similar to *M. chamomilla* oil.
- Daisy preparations are used for rheumatism.
- Is used for GI problems and oral infections.



# RESINS



- Resins occur in plants as a result of physiological events or a pathological factor, they are used as pharmaceutical raw material or drug adjuvant in pharmacy.
- The chemical structure of the resins are not entirely described but we know that they are mainly composed of diterpenes, triterpenes and politerpenes in a complex manner.



- Resins physically defined as an amorphous hard mass burning with a flaming flame that softens when heated. They show a conchoidal and shiny surface when broken. They can easily be grounded, powdered.

- Resins are insoluble in water and can not be carried with water vapor. But rarely, they contain some water soluble compounds.
- Insoluble in pethrolum ether,
- Soluble in alcohol, chloroform, ether.
- The color of the resins darken when oxidized. Gives red color when treated with sulphuric acid.

- Resins do not exist alone in the plants.
  - Fused in the essential oil, oleoresin
  - Together with gums, gum resin
  - Together with essential oil and gum, oleo gum resin
- Balsam is an oleoresin containing free sinamic or benzoic acid.
- Some herbal compounds can contain both resin and latex (lactoresin).

- Coniferae, Burseraceae, Convolvulaceae, Leguminosae, Umbelliferae are the families which containing resins. Plants carries resins and the related compounds in secretory channels.
- Some plants do not contain secretory channels, and these channels form due to physical effects and pathologic events (eg. *Myroxylon* sp.)
- In some plants secretory channels occur naturally and due to physical and pathological circumstances number of these channels increase (eg. *Liquidambar orientalis*).

➤ Resins sometimes do not exist in secretory channels, take place in secretory cells (Convolvulaceae) and glandular trichomes (*Cannabis sativa*).

- Kehribar (Succinum) which is a resin (previously used as antispasmodic) is obtained from *Pinus succinifer* (Pinaceae).



- Colophony is a resin obtained by distillation of pinus oleoresin (after removing essential oil)
- Resin products are obtained by wounding, and this wounding process can be applied either with special knives, or by burning.



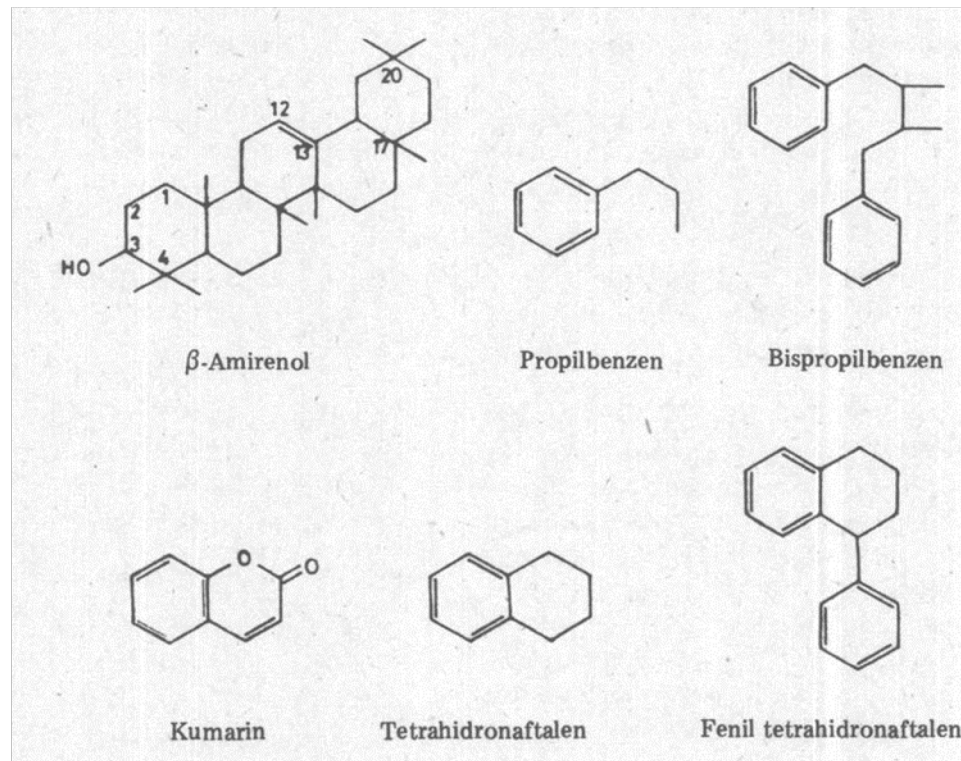
- In some plants resins can be obtained by extraction. Generally 90% alcohol (Convolvulaceae) and ether are used.



# Chemical Structure of Resins

- Mixture of many monomeric and polymeric compounds. Main constituents are resin alcohols, resin esters, resin acids and resins.

- Resin alcohols can be classified in two groups:
  - Resinols, monomeric compounds with triterpenic and aromatic structure.
  - Resinotannols, polymeric compounds with aromatic structures condensing with hydroxyl.



**Resinotannols:** The resin alcohols which give a specific tannin reaction with iron salts are termed as resinotannols.

A number of resinotannols have been isolated from the plant kingdom. It is an usual practice to name them according to the resins in which they are found, such as:

Alocresinotannol – From Aloe species viz., Aloe barbedensis Miller, (Curacao Aloes); Aloe perryi Baker, (Socotrine Aloes); Aloe ferrox Miller, Aloe africana Miller, Aloe spicata Baper. All these belong to the natural order Liaceae.

Ammoresinotannol – From Ammoniacum i.e., the oleo-gum-resin from Dorema ammoniacum D. Don. (Family: Umbelliferae).

Galbaresinotannol – From Galbanm i.e., the oleo-gum-resin from Ferula galbaniflua Boiss et Bubse (Family: Unbelliferae).

Peruresinotannol – From Balsam of Peru i.e., the balsam obtained from Myroxylon balsamum var Pereirae (Royle) Harms (Family: Fabaceae);

Siaresinotannol – From Sumatra Benzoin (Benzoin, Styrax) i.e., the gum exuded from Styrax benzoin Dryander (Family: Styracaceae).

Toluresinotallol – From Balsam of Tolu i.e., the Balsam obtained from Myroxylon balsamum (Linn.) Harms. (belonging to the family. Leguminosae).

**Resinols:** The resin alcohols that fail to give a positive reaction with tannin and iron salts are known as resinols. The following are some typical examples of resinols, for instance:

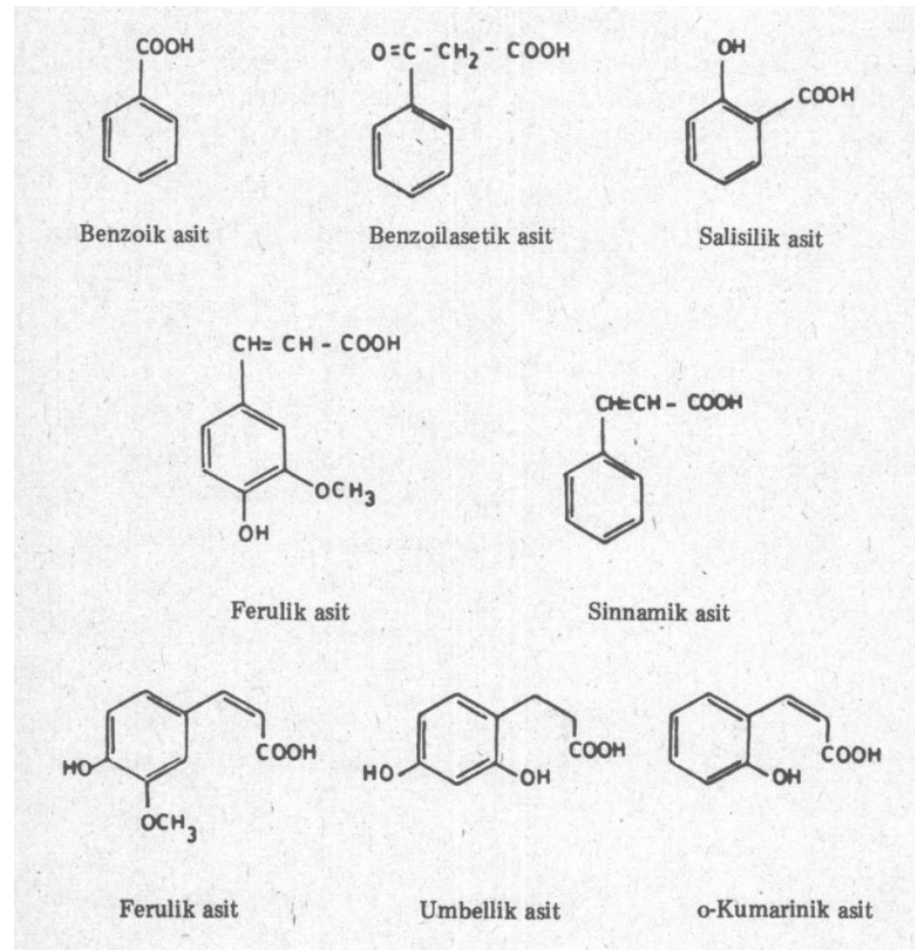
Benzoresinol – From Benzoin which is purely a pathological product obtained either from Styrax benzoin Dryander and Styrax paralleloneurus Brans. (Sumatra Benzoin) or from Styrax tonkinensis Craib. (Siam Benzoin) belonging to family Styraceae.

Storesinol – From storax which is the balsamic resin usually obtained from the trunk of Liquidamber orientalis Mill. family Hamamelidaceae.

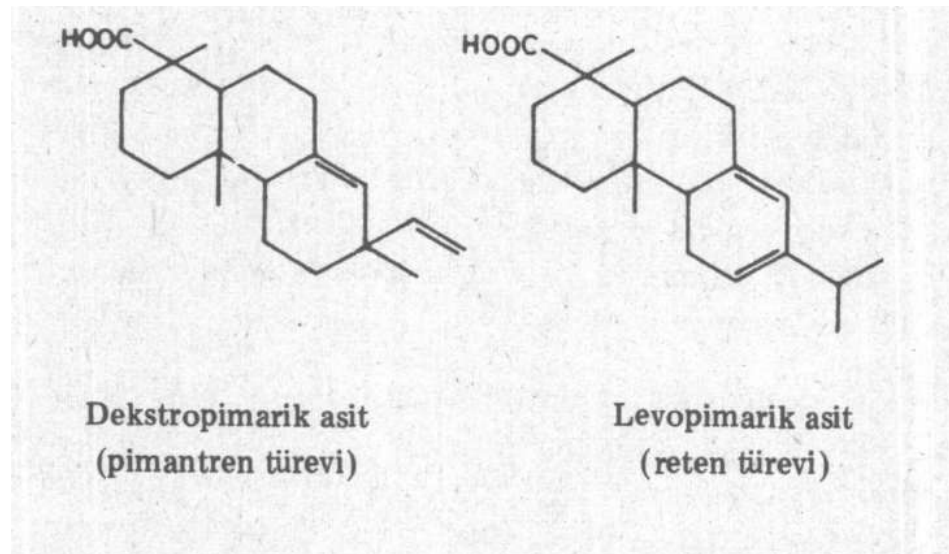
Gurjuresinol – From Gurjun Balsam that is the aleo-resin obtained from Dipterocarpus turbinatus Gaertn. F. belonging to family: Dipterocarpaceae.

Guaiaresinol – From Guaiacum Resin obtained from the heartwood of Guaiacum officinale Linn. and Guaiacum sanctum Linn. belonging to family: Zygophyllaceae.

➤ Resin esthers, are the esthers formed by the esterification of resinols and resinotannols with organic acids such as benzoic acid, salisilic acid, sinnamic acid, ferulic acid, umbellic acid ve coumarinic acid.

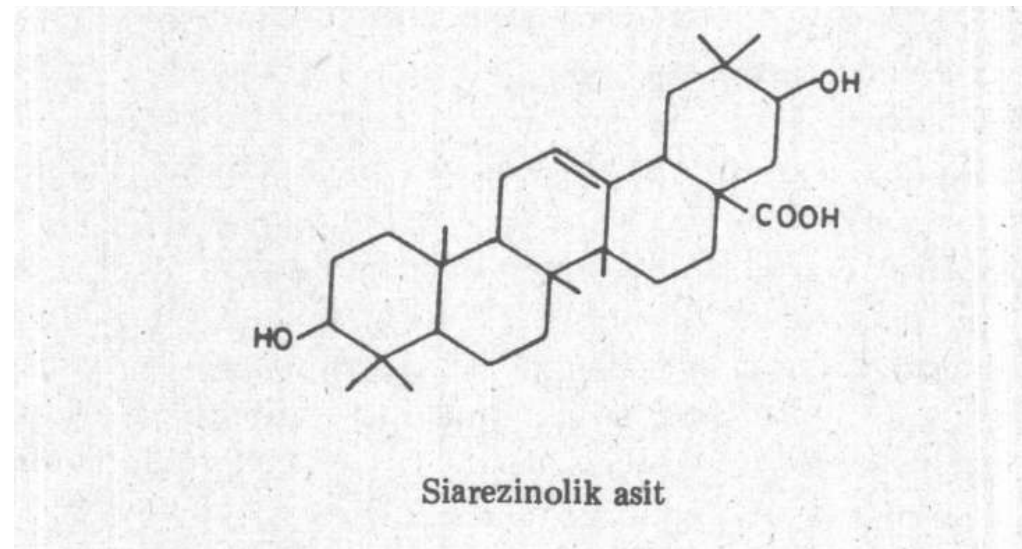


- Resin acids are the terpenic compounds, diterpene and triterpene.
- Diterpenic resin acids, 20 C reten or pimantren derivatives. Eg. abietic acid, levopimaric acid, dekstropimaric acid.



# Resins chemical structure

- Triterpenic resin acids are 30 C.
- 4, 17 and 20 C carry one COOH group. eg. siarezinolic acid.



- Resens are politerpenic compounds and a little is known about them.
- Resins can be recognized by Sudan III reagent.
- Density, saponification index, iodine index, acidic index, transparency point and softening value.

➤ Some of the resins are used for medicinal purposes.

❖ narcotic → Hemp

❖ purgative → Convolvulaceae and Cucurbitaceae resins

❖ antiseptic → Terebinthina

❖ expectorant → Grinadelia resin

❖ vermifuge → Asa foetida resin



- Some resins are used externally:
  - ❖ Euphorbiaceae resin rubefiant
  - ❖ *Daphne gnidium* cortex resin used against papillomas.
  - ❖ *Podophyllum* resins antitumoral.
  - ❖ Balsams are wound healing and antiseptic.