

# RESINS:

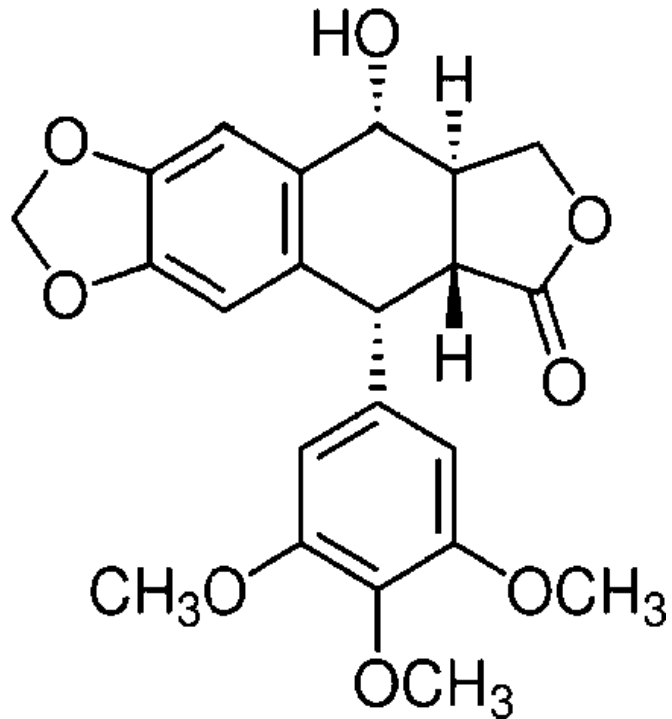
## Extraction and Isolation:

- Pharmaceutical resins are obtained from the plants and animals by following methods.
- Method 1: A Powdered drug is extracted with alcohol, filtered and concentrated.
- Then concentrated extract is shaken with excess of water to get precipitated.
- This method is used for extraction of Jalap, Podophyllum, ipomoea, etc.
- Method 2: By distillation for separation of oil, e.g. Colophony, copaiba, etc.
- Method 3: By heating the plant part, e.g. Guaiacum etc.
- Method 4: As plant exudates by incision, e.g. Myrrh, Balsam, etc.

# PODOPHYLLOTOXIN

Biological source:

Podophyllotoxin is the lactone resin present in the root and rhizome of *Podophyllum hexandrum* and *P. emodi*, belongs to family – Berberidaceae. Podophyllum resin contains not less than 40% and not more than 50% of podophyllotoxin



# PODOPHYLLOTOXIN

- Isolation:
- Required quantity of rhizomes or roots of *P. emodi* is taken with methanol, filtered it and evaporated to semisolid mass.
- Semisolid mass is dissolved into acidic water.
- Precipitate is formed which should be allowed for at least for 2hrs., filtered it and the filtrate is washed with cold water.
- The residue is collected, washed with acidified water and dry to obtain dark brown amorphous powder.
- Then the residue is extract with hot alcohol, filtered and evaporated to dryness.
- Finally residue is re- crystallise in benzene to yield podophyllotoxin

# PODOPHYLLOTOXIN

- **Properties:**
- **Appearance:** White to off-white solid
- **Odour:** Characteristic
- **Taste:** Bitter
- **Solubility:** It is soluble in acetone, benzene; very soluble in ethanol, chloroform; slightly soluble in water; insoluble in ethyl ether
- **Identification by chemical test:**
- **Sample drug + 50% H<sub>2</sub>SO<sub>4</sub> → violet-blue color**

# PODOPHYLLOTOXIN

- Analysis by TLC
- Sample preparation : 1mg of Podophyllotoxin is dissolved in 1ml of methanol
- Standard sample : Podophyllotoxin                      Stationary phase : Silica gel-G
- Mobile phase : Chloroform: Methanol (90:10) for about 6cm (Only glycosides are separated but aglycone like podophyllotoxin remains in the region of the front. (TOULENE :ETOAC::5:7)
- The same plate is again eluted with more weakly polar Solvent Chloroform: Acetone (65:35) upto 12cm.
- Detecting agent : Spray with methanol  $H_2SO_4$ , heat 10 min at  $110^\circ C$
- RF Value : 0.65    Color spot : Yellow spot
- Analysis by HPLC                      Method : Isocratic
- Stationary phase : C18 column
- Mobile phase : Methanol: water (6:4) at flow rate 0.8ml/min.
- Detection : Photodiode detector at 283nm

# PODOPHYLLOTOXIN

## Utilization:

- Podophyllotoxin and its derivatives are used as cathartic, purgative, antiviral agent, vesicant, antihelminthic, and antitumor agents (antiproliferative agent).

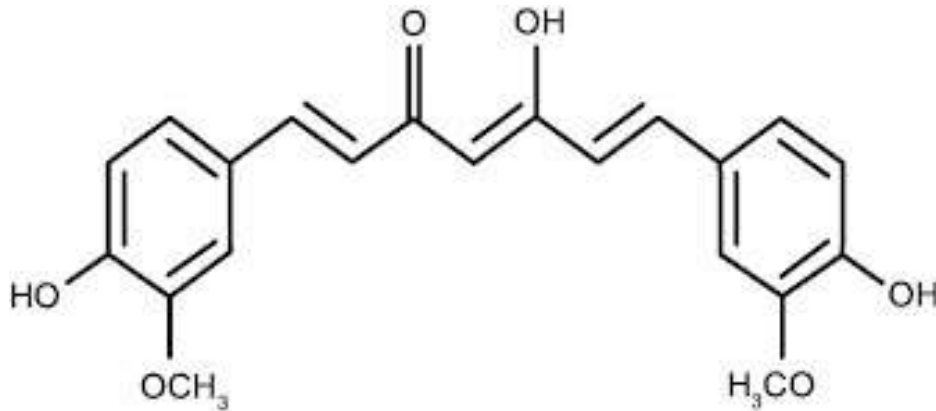
## Storage condition:

- It should be store in well closed and air-tight containers protected from light and in cool place.

# Curcumin

Biological source:

- Curcumin or Curcuminoids are the diaryl heptoid compounds obtained from the dried rhizomes of Turmeric, *Curcuma longa*, belongs to family – Zingiberaceae.
- Curcumin is the major colouring principle present upto 5% in the rhizomes.



# Curcumin

- Curcumin can be obtained by different processes.
- Method 1: Turmeric powder is extracted with n-hexane for 2hrs., filtered it and discarded n-hexane extract. Then marc is extracted with acetone for 2hrs.
- The acetone extract is distilled off and dried the crystals of curcumin. It is recrystallized from hot ethanol to yield orange red needles.
- Method 2:
- Turmeric powder is extracted with pure alcohol by Soxhlet extractor until colouring matter is removed.



# Curcumin

- Alcoholic extract is filtered and concentrated under reduced pressure to semisolid residue.
- This residue is dissolved in sufficient quantity of benzene.
- Benzene portion is transferred to separating funnel and 0.1% NaOH solution is added, shaken slowly.
- The alkali layer is separated and repeated it twice.
- Combined alkali layer and acidify with HCl, yellow colour precipitate is formed.
- The extract is concentrated with continuous stirring; lumpy mass of resin will be separated out.
- The extract is filtered and evaporated the filtrate to get crystal of pure curcumin

# Curcumin

## Properties:

- Appearance: Orange yellow crystalline powder
- Odour: Characteristic
- Taste: Slightly pungent bitter
- Solubility: Insoluble in water and ether, but soluble in alcohol

## Identification by chemical test:

- Sample is treated with acetic anhydride and conc.  $\text{H}_2\text{SO}_4$ , it gives violet color. When this test is observed under UV light, red fluorescence is seen

# Curcumin

## Analysis by TLC:

- Sample preparation : 1mg of Curcumin is dissolved in 1ml of methanol
- Standard sample : Curcumin
- Stationary phase : Silica gel-G
- Mobile phase : Chloroform: Ethanol: Glacial acetic acid (94:5:1)
- Detecting agent : Observed under U.V light at 366nm
- RF Value : 0.79
- Analysis by HPLC
- Method : Isocratic
- Stationary phase : C18 column
- Mobile phase : Methanol: 2% Acetic acid and Acetonitrile
- Detection : UV-Visible detection 425nm

Curcumin I

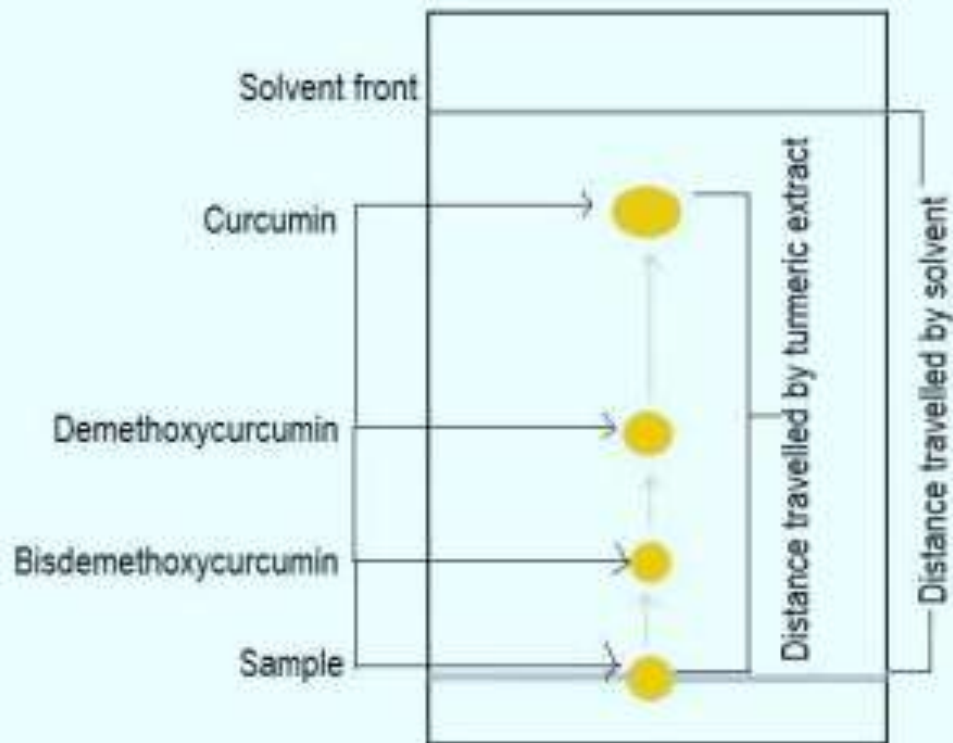
Curcumin II

Curcumin III

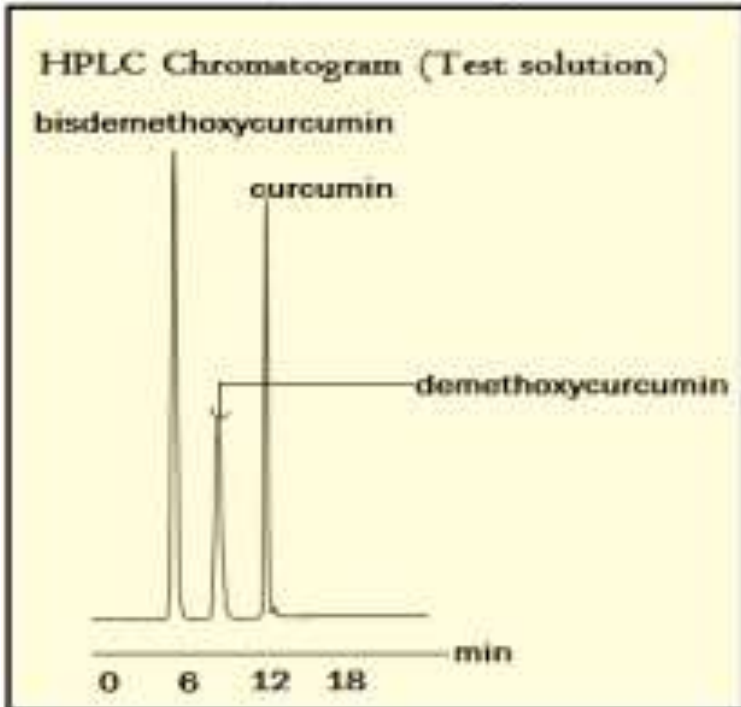
Mixture (a)



### Spot Visualization



# HPLC



Reference list of compounds and their retention times

Compounds	Structure	Retention time (minutes)
Curcumin		12
Demethoxycurcumin		9
Bisdemethoxycurcumin		5.9

# Curcumin

## Utilization:

- It is used as ant-inflammatory, anti arthritic, antimicrobial and antioxidant.
- It is also used against peptic ulcer, wound healing.

## Storage condition:

- It should be store in well closed and air-tight containers protected from light and in cool place.