INDUSTRIAL PRODUCTION, ESTIMATION AND UTILIZATION OF PHYTOCONSTITUENTS (ARTIMISININ AND DIOSGENIN)

Dr. SUNITA PANCHWAT

Assistant Professor

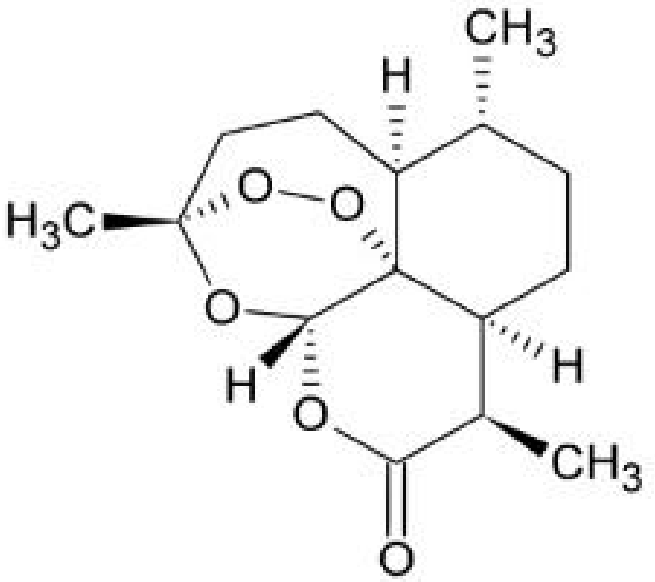
Department of Pharmaceutical Sciences

MLSU, Udaipur

ARTEMISININ

- **Source:** sesquiterpene lactone obtained from the leaves & unexpanded flower heads of *Artemisia annua*.

  Family- Asteraceae.



Physical Properties

1. Colour: White crystalline powder
2. Odour: Odourless
3. Melting Point: 156-157°C
4. Solubility: Freely soluble in methanol, ethanol

   Very soluble in Dichloromethane

   Partially soluble in water

5. Loss on drying: not more than 0.5%
6. Storage: Tightly closed container

Industrial production:

1. Fresh leaves are dried below 60°C, powder is extracted with methanol by maceration.
2. Methanol extract partitioned with hexane
3. The hydro alcoholic extract partitioned with ethyl acetate until the colourless.
4. Contentrated at controlled temperature at 40°C under vacuum.
5. Artemisinin obtained as fine white crystals after recrystallization with cyclohexane.

- **Estimation:**

HPLC & HPTLC method

Mobile phase- n-hexane : ethyl acetate (7.5: 2.5 v/v)

Stationary phase- silica gel F254

Visulazing agent- anisaldehyde sulphuric acid reagent followed by heating to 110°C.

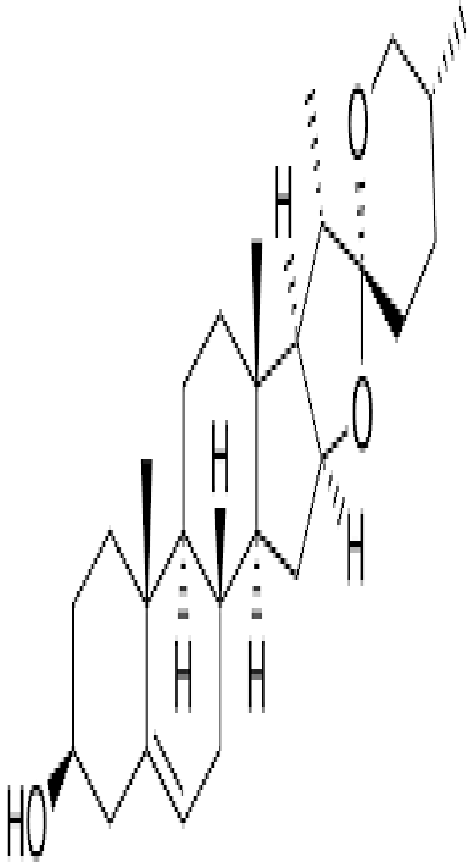
- **Utilization:**

1. Antimalarial
2. In gastric infections
3. Suppress inflamatory immune reactions
4. Anticancer

DIOSGENIN

- Diosgenin is a precursor for partial synthesis of oral contraceptives, sex hormones and other steroids is widely used in Pharmaceutical industry.
- Many researchers found that diosgenin has antiproliferative and proapoptotic effects on cancer cells or on rheumatoid arthritis.
- It also shows pharmacological activities such as antilipoperoxidative and antiskin aging effect.

- The main raw material used in industry is Dioscorea zingiberensis C.H. Wright because of the high content of diosgenin in its tubers.



DIOSGENIN

Industrial production:

1. Dried powder hydrolyzed with 2.5N H_2SO_4 by reflux or autoclave.
2. Marc washed with 10% sod. Bicarbonate to neutralize acid.
3. Hydrolyzed powder extracted with benzene for 6-8 hrs.
4. Benzene extract is filtered, residue dissolve in chloroform and concentrated by recystallization.

ESTIMATION- Diosgenin can be isolated by the following analytical methods.

- BY TLC Method

a. Mixture of Chloroform: ethanol (95:5) or Chloroform: acetone (3:1) is the solvent system.

b. Silica gel plates are used as the stationary phase.

c. Antimony trichloride ($SbCl_3$) in chloroform is the detecting agent used.

- BY HPLC Method

A stock solution of diosgenin (100 µg/ml concentration) is prepared by dissolving 1 ml of diosgenin in 1 ml of chloroform. A calibration curve 1000-6000ng/spot is prepared and analyzed for reproducibility, linearity and validating the proposed method.

- **Estimation:**

HPTLC method

Mob. Phase- toluene: ethyl acetate: formic acid (5:4:1)

St. phase- Silica gel F 254

- **Utilization:**

1. As a precursor for steroidal synthesis
2. In preparation of oral contraceptives
3. In treatment of rheumatism.


THANK YOU