

5.3.4. Tulsi ⑬

Tulsi is an herbaceous, branched annual plant. It can be easily grown and is regarded as the holy plant of Hindus. It also holds an important place in the ancient Ayurveda system of medicine.

Synonyms

Bisva Tulsi, Varavara, Manjariki (Sanskrit), Babui, Tulsi, Sabzan, Kala-Tulsi, Baranda, Shyama Tulsi, Rama Tulsi (Hindi), and Holy Basil (English).

Biological Source

Tulsi is the dried leaves of *Ocimum sanctum*.

Family

Labiatae.

5.3.4.1. Occurrence and Distribution

Tulsi is abundant in the Indian sub-continent. It is cultivated in gardens and also found near temples. It can be propagated by seeds. Tulsi is also cultivated on a commercial scale for its volatile oil.

5.3.4.2. Organoleptic Evaluation

Tulsi is an erect, sweet-scented, pubescent herb (figure 5.9). It grows with a height of 30-100cm. It abundantly grows near cultivated field gardens and waste lands.

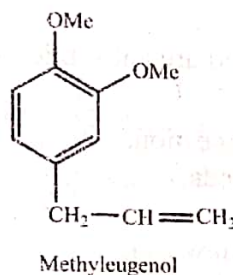
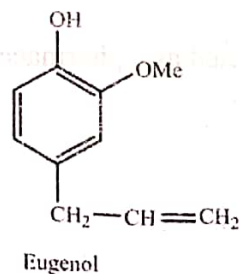
- 1) **Leaves:** Elliptical, oblong, and obtuse on both sides.
- 2) **Stem:** Erect, herbaceous, branched, and hairy.
- 3) **Fruit:** Group of 4 nutlets, each having a seed.
- 4) **Flowers:** Purple and crimson in colour.
- 5) **Odour:** Leaves have an aromatic odour.
- 6) **Taste:** Leaves have a characteristic taste.



Figure 5.9: *Ocimum Sanctum*

5.3.4.3. Chemical Constituents

The leaves and flowering tops of tulsi contain 0.1-0.9% of bright, yellow coloured, and pleasant smelling **volatile oil**. The oil content of tulsi varies with the type, the cultivation place, and its collection seasons. Oil is collected by steam distillation. The volatile oil contains **eugenol (70%)**, **carvacrol (3%)**, **eugenol-methyl-ether (20%)**, and **caryophyllene**. The seeds of tulsi contain fixed oil having good drying properties. Alkaloids, glycosides, saponin tannins, vitamin C (in large amounts), and small amounts of maleic, citric, and tartaric acids are also found to be present in tulsi.

**5.3.4.4. Therapeutic Efficacy**

Tulsi has the following therapeutic properties:

- 1) It is a diaphoretic, carminative, stimulant, demulcent, aphrodisiac, diuretic, fragrant, aromatic, anthelmintic, and febrifuge.
- 2) It is also used as an antidote to snake-poison.

- 3) It exhibits antimicrobial properties.
- 4) It also possesses anti-inflammatory properties due to the presence of eugenol oil in leaves.
- 5) It is used in respiratory tract infections.
- 6) It contains ursolic acid which is anti-allergic.

5.4. ANTIRHEUMATICS

5.4.1. Introduction

Antirheumatics are drugs used in the therapy of inflammatory arthritis, predominantly rheumatoid arthritis, but also idiopathic juvenile arthritis, psoriatic arthritis, ankylosing spondylitis and others.

5.4.2. Guggal

Guggal is obtained from the sap (gum resin) which exudes from *Commiphora wightii*. In Ayurvedic medicine system, it is in use since 600 BC. In ancient literatures, it is mentioned to be useful in the treatment of atherosclerosis.

Synonyms

Palankasha and Devadhupa.

Biological Source

Guggal is an oleogum-resin (oleoresin) that exudes spontaneously as a result of injury from the bark of *Commiphora wightii*.

Family

Burseraceae.

5.4.2.1. Occurrence and Distribution

The guggal plant may be found from northern Africa to central Asia, but is most commonly found in northern India.

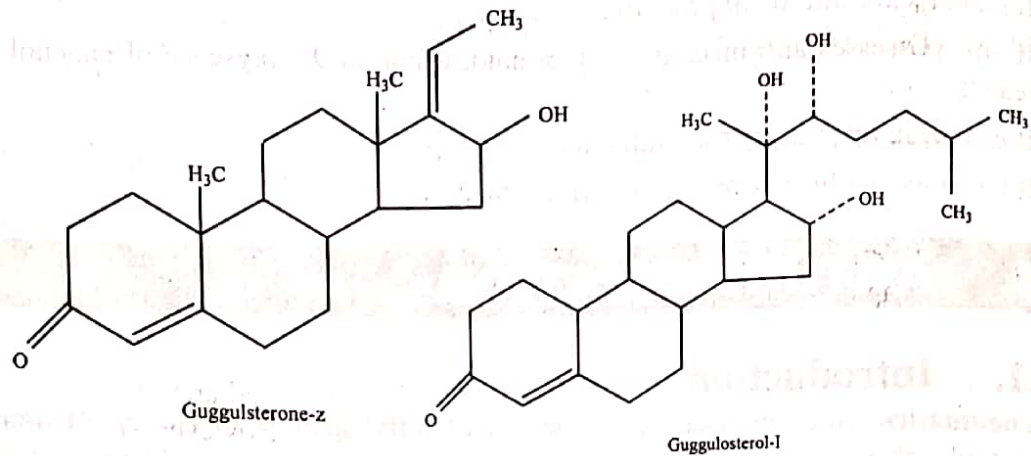
5.4.2.2. Organoleptic Evaluation

Guggal has the following organoleptic features:

- 1) **Plant:** Branched, thorny, dimorphic, and bisexual.
- 2) **Leaves:** Small (like that of neem), serrate, obovate, 1-5cm long, and 0.5-2.5cm broad.
- 3) **Flowers:** Red or sometimes pink coloured.
- 4) **Fruits:** Pulpy and ovate in shape.
- 5) **Juice:** Thick, aromatic, inflammable and melts in sun, develops a milky white colour when immersed in warm water.
- 6) **Colour:** Brown to pale yellow or dull green in colour.
- 7) **Odour:** Agreeable, aromatic, and balsamic.
- 8) **Taste:** Bitter and characteristic.

5.4.2.3. Chemical Constituents

Guggal contains steroids, diterpenoids, aliphatic esters, amino acids, etc., in a complex mixture. Some phytochemicals like **guggusterols I, II, III, IV, V, Z-guggulsterone, E-guggulsterone, and 16- β -hydroxyprogesterone** are also present. **Mukulol** (an alcohol type) is also found to be present in guggul.



5.4.2.4. Chemical Test

Guggal extract is prepared with ethyl acetate. This extract is boiled with acetic anhydride. The obtained solution is cooled and added with 2ml of H_2SO_4 . A green colour develops at the junction of liquid due to the presence of sterols.

5.4.2.5. Therapeutic Efficacy

Guggal has the following therapeutic properties:

- 1) Oleogum resin obtained from guggal is used in obesity, arthritis, and rheumatism.
- 2) It is also used as an anti-inflammatory and hypocholesterolemic drug.
- 3) Its semi-purified form, patented with the name of 'Gugulip' and is marketed by Cipla, shows antihyperlipidemic activity.

5.4.3. Colchicum

Colchicum autumnale, an autumn-blooming flower is also known as **meadow saffron**, **autumn crocus** or **naked lady**. It bears resemblance to the true crocuses belonging to Iridaceae family. The name '**naked lady**', has emerged from the fact that the flowers grow from the ground to their full length after the leaves are completely dead.

Synonyms

Autumn Crocus, Wild Saffron, Meadow Saffron, European Colchicum seed, Meadow Crocus, and Colchicum root.

Biological Source

Colchicum is the dried ripe seeds and corm of *Colchicum autumnale* Linn. The Indian species is obtained from *C. luteum* Baker.

Family

Liliaceae

5.4.3.1. Occurrence and Distribution

The only species of *Colchicum* genus found in Great Britain and Ireland is *Colchicum autumnale*. It is also found in the European region from Portugal to Ukraine. It has been reported that colchicum is naturalised in different countries of the world, including Sweden, Denmark, the Baltic States, New Zealand and European Russia.

5.4.3.2. Organoleptic Evaluation

The organoleptic features of colchicum seed and corm are as follows:

- 1) **Characters of Seed:** Generally in the month of July or August, the ripe seeds are collected and dried. The seeds are tremendously hard having minutely pitted testa of

reddish-brown colour. The seeds are globular or ovoid shaped having the diameter of 2-3mm. On drying, the seed colour becomes dark and a layer of sugary exudation covers its outer surface all over.

- 2) **Characters of Corm:** The corms are collected in the month of July. These are then sliced into transverse sections and kept for drying at a temperature of not more than 65°C. The outer membranes are eliminated leaving behind the whole corm with 2-3cm diameter. The seeds in transverse slices obtained after drying retains the reniform shape (kidney-shaped), and the slices of ovate longitudinal shape of 2-5mm thickness are obtained after drying.

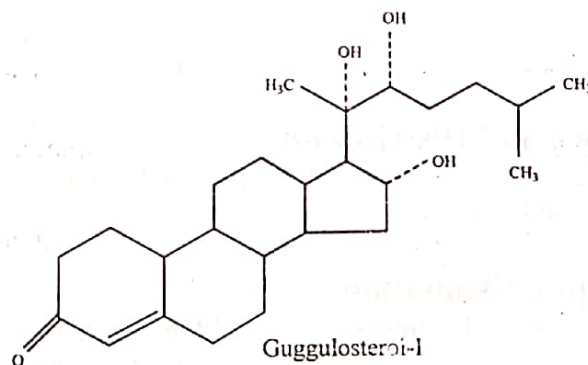
The outer surface (epidermis) of the corm is slightly wrinkled and cinnamon-brown coloured. The internal surface remains white and starchy. However, scattered fibro-vascular bundles are observed when the interior of the corm is smoothed carefully. A short fracture is seen when the drug breaks into smaller portions. It is bitter in taste having less marked odour than the fresh drug.

5.4.3.3. Chemical Constituents

Chief constituents present in the colchicum seed and corm are:

- 1) Seed contains 0.2-1% amino alkaloids with colchicine as the chief constituent.
- 2) Colchicine content present in seed and corm is about 0.8% and 0.6%, respectively.
- 3) It also contains demecolcine in minor quantity.
- 4) The constituents, colchicine and demecolcine contain tropolone (cycloheptatrienone) ring structure as the basic nucleus in the chemical structure.

Colchicine ($C_{22}H_{25}O_6N$) is obtained as pale yellow crystals, amorphous or in powdered form. It has a bitter taste and is odourless. It darkens on exposure to air. Colchicine is freely soluble in alcohol and chloroform, soluble in 25 parts of water and in 220 parts of solvent ether.



5.4.3.4. Chemical Tests

Chemical tests performed for the identification of colchicum are:

- 1) On treating with 70% sulphuric acid, colchicine gives yellow colour.
- 2) On treating an alcoholic solution of colchicine with ferric chloride, red colour is obtained.

5.4.3.5. Therapeutic Efficiency

Colchicum possesses the following medicinal properties:

- 1) It is the drug of choice for the treatment of rheumatism and gout.
- 2) It has also been reported to possess anti-tumour activity.
- 3) It acts as a potent anti-gout drug.
- 4) A study reported that hydro-alcoholic extract of *Colchicum luteum* (CLHE) showed potent anti-inflammatory and anti-granuloma activity.
- 5) *Colchicum luteum* also possesses anti-arthritis activity.

- 6) **Anticancer:** Antiproliferative action of colchicine is the capacity of the tubulin-colchicine complex bound to the ends of microtubules to physically prevent the elongation of microtubule polymer. Microtubules are main protein filaments that make up the cytoskeleton, which is crucial in regulation of many activities including cell migration, division, and polarisation. Microtubule elongation stops, the mitotic spindle is disrupted, and cell division cannot proceed due to prevention of microtubule polymerisation. This effect makes colchicine function effectively as a "mitotic poison" or spindle poison as tubulin availability is essential for mitosis. (12)