

ANTI-TUSSIVES

These are the agents which act upon the pulmonary membranes. These stimulate and expel the bronchial mucous or secretions. They act by relieving spasms of bronchial tubes, by increasing flow from the inflamed membrane and also by soothing and irritating the respiratory centre. Examples are Opium, Vasaka, Tulsi.

Vasaka

Synonyms

Vasika, Malabar nut, Adulsa.

Biological Sources

It consists of dried as well as fresh leaves of the plant *Adhatoda vasica* belonging to family **Acanthaceae**. It contains not less than 0.6 percent vasicine.

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Geographical Sources

It is found in India, Sri Lanka, Malaysia, Burma. It is found at altitude of 1000 meters. The plant grows as weed and is propagated by seeds. The plant reaches maximum height of 2 to 3 meters.

Cultivation and Collection

Around 800 m² nursery area is required for raising seedlings needed for one hectare of land. After ploughing the nursery bed (four times), spread neem leaves on the soil. The leaves should be allowed to decay in water for 6–7 days. When the leaves decay completely, the land should be ploughed again four times and levelled. In case neem leaves are not available, 8–10 kg of neem cake and 10–15 kg of vermicompost should be added to the soil during the last ploughing. Later, the soil should be leveled and the seeds sown. Farm waste and trash can be burnt on nursery beds. The heat generated by burning sterilizes the soil and nutrients like potash also get added. Leaves of *Adhatoda vasica* can be incorporated into the soil while

preparing the nursery. This increases soil fertility; acts as an insecticide and renders the uprooting of the seedlings easier.

Morphology.

A dense glabrous shrub up to 0.5 to 1 m. Leaves— alternate, simple, opposite, elliptic or elliptic-lanceolate, acuminate. Flowers—white, in dense spikes, white; bracts ovate or obovate; calyx deeply five-lobed; stamens glabrous.

Chemical Constituents

The leaves of Vasaka contain phyto-chemicals such as alkaloids, tannins, saponins, phenolics and flavonoids. Leaves contain vasicine, a quinazoline alkaloid and an essential oil. It also have other chemicals such as Luteolin, Tritriacontane, B- Sitosterol, Kaempferol,

Uses

The plant is pungent, bitter, acrid, Cooling; causes “vata”, useful in bronchitis, leprosy, blood impurities, heart troubles, thirst, asthma, fever, vomiting, loss of memory, leucoderma, jaundice, tumours, diseases of the mouth. The root facilitates the expulsion of the foetus; useful in strangury and leucorrhoea with blood discharges

Tulsi

Synonyms

Sacred basil, Holy basil.

Biological Sources

Tulsi consists of fresh and dried leaves of *Ocimum sanctum* Linn., belonging to family **Labiatae**.

Geographical Sources

It is a herbaceous, much branched annual plant found throughout India, it is considered as sacred by Hindus. The plant is commonly cultivated in garden and also grown near temples. It is propagated by seeds. Tulsi, nowadays, is cultivated commercially for its volatile oil.

Morphology.

It is much branched small herb and 30 to 75 cm in height. All parts of tulsi are used in medicine, especially fresh and dried leaves. Leaves are oblong, acute with entire or serrate margin, pubescent on both sides and minutely gland-dotted, The leaves are green in colour with aromatic flavour and slightly pungent taste. Flowers are purplish in colour in the form of racemes. Nutlets are subglobose, slightly compressed, pale brown or red in colour. Seeds are reddish-black and subglobose.

Chemical Constituents

Tulsi leaves contain bright, yellow coloured and pleasant volatile oil (0.1 to 0.9%). The oil content of the drug varies depending upon the type, the place of cultivation and season of its collection. The oil is collected by steam distillation method from the leaves and flowering tops. It contains approximately 70% eugenol, carvacrol (3%), and eugenol-methyl-ether (20%). It also contains caryophyllin. Seeds contain fixed oil with good drying properties. The plant is also reported to contain alkaloids, glycosides, saponin, tannins, an appreciable amount of vitamin C and traces of maleic, citric, and tartaric acid.

Uses

The fresh leaves, its juice and volatile oil are used for various purposes. The oil is antibacterial and insecticidal. The leaves are used as stimulant, aromatic, spasmolytic, and diaphoretic. The juice is used as an antiperiodic and as a constituent of several preparations for skin diseases and also to cure earache. Infusion of the leaves is used as a stomachic. The drug is a good immunomodulatory agent.

Tolu Balsam

Synonyms

Tolu Balsam, Thomas balsam.

Biological Sources

Tolu Balsam is obtained by incision of stem of *Myroxylon balsamum* belonging to family **Papilionaceae**.

Geographical Sources

The plant grows in Colombia (near lower Magdalena and Canca rivers), West Indies, Cuba, Venezuela, and Peru. The trees are cultivated in the West Indies.

Morphology

Tolu Balsam occurs as soft, yellowish-brown or brown, semisolid, or plastic solid, transparent in thin layers, brittle when old, dried or kept in cold, odour aromatic, and taste is aromatic, vanilla-like, and slightly pungent. It is insoluble in water and petroleum ether; soluble in alcohol, benzene, chloroform, ether, glacial acetic acid, and partially soluble in carbon disulphide and NaOH solution. On keeping it turns to a brown, brittle solid. It softens on warming

Collection

Tolu Balsam is a pathological resin and is formed in trunk tissues as a result of injuries. It is collected all the year except the period of heavy rains by making V-shaped incisions in the bark and sap wood. Calabash cups are placed to receive the flow of balsam. Many other incisions are made on higher portion on the trees. Collected balsam is transferred into larger tin containers and exported.

Chemical Tests

1. Alcoholic solution of Balsam Tolu (1 g) gives green colour with ferric chloride due to toluresinotannols.
2. Alcoholic solution of Balsam Tolu is acidic to litmus paper.
3. To filtered solution of Balsam Tolu (1 g) in water (5 ml) aqueous potassium permanganate solution is added and heated for 5–10 min. Odour of benzaldehyde is produced due to oxidation of cinnamic acid.

Chemical Constituents

Tolu Balsam contains resin (80%) which is a mixture of resin alcohols combined with cinnamic and benzoic acids. The aromatic acids are also present in free state in proportions 8–15%. The other constituents reported in the drug are benzyl benzoate, benzyl cinnamate, vanillin, styrene, eugenol, ferulic acid, 1,2-diphenylethane (bibenzyl), mono- and sesquiterpene hydrocarbons, alcohols, and triterpenoids. Tolu Balsam contains 35 to 50% of total balsamic acids calculated on the dry alcohol-soluble matter.

Uses

Balsam of Tolu is used as an expectorant, stimulant, and antiseptic. It is an ingredient of cough mixtures and compound benzoin tincture. It is also used as a pleasant flavouring agent in medicinal syrups, confectionery, chewing gums, and perfumery.

