

OVERVIEW ON “GUGGULU” (COMMIPHORA MUKUL)



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INTRODUCTION

- ▶ Guggulu (Commiphora mukul) means “fights against disease”., is an indigenous well known drug and has been used for centuries to treat several ailments.
- ▶ Guggulu is an oleo-gum resin that exudes spontaneously as a result of injury from the bark of Commiphora mukul .
- ▶ It is a key ingredient of a large number of Ayurvedic formulations. Hence, it is considered as one of the “Divyaushadhis” in Ayurveda.
- ▶ Guggulu was introduced as a medicine in 1966, and but approved as a hypo-lipidemic drug for marketing in India in 1986.
- ▶ Studies revealed that guggulu contain flavonoids, terpenes, phyto-sterols etc. producing number of biological activities like Anti-inflammatory, Anti-obesity, Anti-neoplastic, Anti-diabetic, Hypo-lipidemic, Anti-arthritic, Anti-fertility, Anti-Atherosclerotic etc.

► CLASSIFICATION:

- Kingdom: Plantae
- Sub-kingdom: Tracheobionta
- Super-division: Spermato-phyta
- Division: Magnolio-phyta
- Class: Eudicots
- Subclass: Rosidae
- Order: Sapindales
- Family: Burseraceae
- Genus: Commiphora Species: mukul or wightii
- Botanical name: Commiphora mukul (Hook. ex Stocks).

VERNACULAR NAMES

➤ In Sanskrit -

- गुग्गुलुः - गुजो व्याधेर्गुडति रक्षतीति ।
- कणनिर्यासः - कणरूपो निर्यासोऽस्य।
- कालनिर्यासः - कालः कृष्णाभो निर्यासोऽस्य ।
- कुम्भोलूखलकम् - कुम्भसदृशादुलूखलसदृशाद्वा कोशा त्रिर्गतः।
- कौशिकः - कोशे भवः।
- देवधूपः - देवपूजायां धूपे प्रयुक्तः।
- पलंकषः - पलं मांसं कषति हिनसति, स्थौल्यहृदित्यर्थः।

- पुरः - निर्यासेषु श्रेष्ठः।
- मरुदेश्यः - मरुस्थले जायमानः।
- महिषाक्षः - महिषनेत्रवत् रक्ताभकृष्णवर्णः।

➤ In Hindi -

- Googal
- Guggal

➤ In English -

- Gum-gugul
- Indian Bedellium

CLASSICAL CATEGORIZATION

➤ Charaka -

▪ Samjnasthapana Mahakashaya

हिङ्गुकैटर्यारिमेदावचाचोरकवयस्थागोलोमीजटिलापलङ्कषाशोकरोहिण्य
इति दशेमानि सञ्ज्ञास्थापनानि भवन्ति

(Ch.su.4/48)

These drugs are penetrative, hot, minute, light and motile in quality. Because of this, they have conscious restorative property, which is why they are useful in memory disorder, irregular sleep or concentration and loss of consciousness.

▪ Kashaya Skandha

- Sushruta - Eladi gana
- Vagbhata - Eladi gana

एलादिको वातकफौ निहन्याद्विषमेव च ।
वर्णप्रसादनः कण्डूपिडकाकोठनाशनः ॥

(Su.su.38/25)

The group of 28 drugs consist in subduing the action of Vayu and Kapha and neutralising the effect of poison. It is a cosmetic and arrest the eruption of pimple and other skin related problem like skin itching, rashes and urticaria.

GUGGULU IN AYURVEDIC LITERATURE

- ▶ In Vedas - Specifically in Atharva Veda, it is mentioned that Yakshma and other diseases will not spread to the area fumigated by Guggulu and introduced as well known DHUPAN DRAVYA.
- ▶ In Samhitas - It is observed that the internal usage of Guggulu was increased during Samhita period.
- Charak samhita - Maharishi Charaka has described Guggulu as the best drug for MEDOROGA and VATA SAMAKA.
 - And also recommended the drug in Rasayana Chikitsa where Shilajeet and Guggulu were used with cow milk.
 - The drug also has been described by him in other diseases as highly effective medicine like KUSTHA, BHAGANDARA, INDRALUPTA, KITIBHA, ARSHA, APCHI, PAMA AND SWETA PRADARA .

❑ Sushruta Samhita – Maharishi Sushruta has described Guggulu in the list of seven most important drugs for the treatment of Sthaulya.

- Acharya Sushruta has prescribed Guggulu with cow urine in condition of vitiated Vata with Medodhatu dominated by Kapha dosha.
- This drug is also mentioned as highly effective in the treatment of Hrdroga ,Aruchi, Gulma and Antarvidradhi.
- He also documented that the new guggulu is VRSHYA while old guggulu is APAKARSANA-

▪ स नवो बृंहणो वृष्यः पुराणस्त्वपकर्षणः ।

(Su.ci.5/41)

❑ Ashtang Hridya – Vagbhata has described it a drugs of choice in Medoroga for its lipid lowering action.

- He has also used the drug in Snehavyapada and in diseases produced due to vitiated Medodhatu, Kapha, Vata and in Amavata.

❑ Sharngdhara Samhita - He quoted it among the drugs to be used for Rasayan Karma.

➤ In Nighantus -

❑ Dhanwantari nighantu - included it under “Chandanadi Varga”.

❑ Madanpala Nighantu - included it under “Karpooradi Varga”.

❑ Kaiydev Nighantu - has mentioned it under “Aushadi Varga”.

❑ Bhavprakash Nighantu - has described it in “Karpooradi Varga”.

❑ Raj Nighantu - included it under “Chandanadi Varga”.

❑ Mahaushadi Nighantu - included it under “Chandanadi Varga”.

❑ Shaligram Nighantu has mentioned it under “Karpooradi Varga”.

BOTANICAL DESCRIPTION

- ▶ Woody shrub or a small tree
- ▶ grows to the height of 2-3 meter
- ▶ much branched with characteristics silvery and paper like bark peelings.
- ▶ Branches are knotty and crooked, divaricate, usually ending in a sharp spine.



- ▶ Leaves: The leaves are rhomboid-ovate, 1-3 foliate, serrate-toothed in the upper part, smooth and shining, the lateral leaflets when present less than half the size of the terminal ones.



- Flowers: Flowers in the fascicles of 2-3; pedicels very short. Calyx campanulate, glandular, hairy; lobes are 4-5 in number, triangular, as long as the tube. Petals are brownish red, broadly linear, nearly thrice the length of the calyx, reflexed at the apex. Stamens are 8-10 in number, alternatively long and short, half the length of the petals. Ovary oblong-ovoid, attenuated into the style.



- ▶ Fruits: The fruits are small, reddish brown to purple in color when ripe, ovoid drupes. Each plant produces about 0.5 to 1kg of oleo-gum resin which is collected from January to March.
- ▶ Gum Resin: Pale yellow to brown aromatic gum resin obtained from the bark of the plant. Agglomerated tears of resin are somewhat transparent, with waxy surface and brittle in nature. Gum-resin is thick, scented, burnt on fire, liquifies in sun heat. When dissolved in water, it turns milky white.



VARIETIES OF GUGGULU

- Bhavmishra described five varieties of Guggulu -

महिषाक्षो महानीलः कुमुदः पद्म इत्यपि ।
हिरण्यः पञ्चमो ज्ञेयो गुग्गुलोः पञ्च जातयः ॥

(Bh.pr.3/30)

1. Mahishaksha - Mahishaksha has the colour of honey-bee or Anjana (antimony sulphide).
 2. Mahanila is similar to its name and looks like a Sapphire, a precious stone. Extremely blue in colour.
 3. Kumuda - Kumuda resembles Kumuda flower (white) in colour.
 4. Padma - Padma resembles Manikya (ruby red).
 5. Hiranya (Kanaka) - Hiranya is like gold in colour.
- Mahikshaksh and Mahanila varieties are beneficial to elephants, Kumuda and Padma bestow health to horses, Hiranya variety is best suited for humans. Mahishaksha is also good for humans.

► Generally , main two types of Guggulu are available :

1. Kana guggulu
2. Bhainsa guggulu

▪ Kana guggulu -

1. Found in Marwar.
2. Colour - Raktabh peeta

▪ Bhainsa guggulu -

1. Found in Kutch and Sindh.
2. Colour - Haritabh peeta

❑ Other two varieties of Guggulu has mentioned in the texts books of Ayurveda:

- 1). Nava Guggulu

- 2). Purana Guggulu

- ✓ The freshly collected Guggulu is tissue builder and aphrodisiac and if stored for more than one year, it is a depletory of tissues. The characters of fresh one are, it is oily, yellowish looks like a ripen Jambu fruit, fragrant and gummy in nature.

- ✓ Purana or old decayed Guggulu is dry, emitting bad smell, devoid of natural colour and potency.

- ✓ Nava Guggulu is useful in debility, whereas the old variety - Purana Guggulu is salutary in obesity and diabetes.

- ❖ Note - Guggulu older than 5 years is considered as Purana Guggulu.

	Nava(Fresh) guggulu	Purana(old) guggulu
Varna (colour)	Kanchana sankasha(Bright yellow) or pakva jambu phala sadrusha(Dark brown)	Tyakta prakruti varna (yellowish brown)
Gandha(odour)	Sugandha(pleasant)	Durgandha (offensive)
Guna(qualities)	Snigdha(oily/greasy), picchila(Slimy)	Laghu(lighter), ruksha(rough), tikshna, Vishad(clean), sukshma, sara
Karma(actions)	Bruhana, Vrushya, Rasayana, Kamottejaka and Artavajanana	Lekhana, Medohara and shukranashana

स नवो बृंहणो वृष्यः पुराणस्त्वतिलेखनः ॥
 स्निग्धः काञ्चनसंकाशः पक्वजम्बूफलोपमः । नूतनो गुग्गुलुः प्रोक्तः सुगन्धिर्यस्तु पिच्छिलः ॥
 शुष्को दुर्गन्धकश्चैव त्यक्तप्रकृतिवर्णकः । पुराणः स तु विज्ञेयो गुग्गुलुर्वीर्यवर्जितः ॥

(Bh.pr.3/42-44)

► According to Kaiydeva Nighantu:

- Guggulu are of five types: Mahishaksha, Mahanila, Kumuda, Padma, Hiranaya.
- According to Kaiydeva Nighantu -
 1. Krishna varna Guggulu - best for Rakta-pitta dosh
 2. Pingal varna Guggulu - best for Kapha-pitta dosh
 3. Sweta varna Guggulu - best for Vata-pitta dosh

कृष्णः शोणितपित्ते च श्लेष्मपित्ते च पिङ्गलः ॥
वातपित्ते तथा श्वेतो गुग्गुलुः शस्यते तथा ।

(Ka.ni.1/1416)

□ Other five types of Guggulu, according to Unani system of medicine:

1. Mukle Saklabi - Brown in colour
2. Mukle arabi - It is reddish brown or purplish in colour and found in Yaman pradesh.
3. Mukle ajarak - Reddish in colour
4. Mukle Yahud - Yellowish in colour
5. Mukle hindi - It is found in India

DISTRIBUTION AND HABITAT

- ▶ Commiphora mukul is widely distributed in tropical region of Africa, Asia and Saudi Arabia.
- ▶ In Indian subcontinent it occur in India, Pakistan, Baluchistan, Bangladesh etc. In India it is distributed in South-Western India and parts of Central India which is represented by Kerala, Kanataka, Tamilnadu, Andhra Pradesh, Maharashtra, Madhya Pradesh, Gujarat and Rajasthan.
- ▶ Kaiydeva mentioned that Guggulu tree habituated in the Maru bhumi pradesh (Vata pradhan desh) will yield five types of gum-resin during Grishm ritu as well as Shaitya ritu.

❖ Climate and soil -

- ▶ The plant grows well in arid, sandy, and rocky tracts of tropical India. Sandy or sandy loam soils are best for its cultivation.
- ▶ Its small leathery leaves and thick bark covered with a white waxy coat over the stems, help it to withstand desert conditions.
- ▶ It prefers a warm, dry climate for good yield of oleo-gum-resin.

PROPAGATION AND CULTIVATION:

- ▶ The Commiphora mukul (Guggulu tree) grows as a woody tree in sandy loam soil with more gypsum content, with pH 7.5-9.
- ▶ Guggulu plant can be propagated both by seed and stem cutting in the arid or semiarid zones.
- ▶ For this purpose, sloppy well drained lands are preferred .

❖ Through seed -

- ✓ Regeneration through seeds in Guggulu is very poor because of presence of a hard seed coat.
- ✓ The seeds sown in the months of June and July in well worked soil beds, germinate at the onset of monsoon rains.



- ✓ One month old seedling are transferred into plastic bags. After 2 years, these seedling attain a height of 30-50 cm and suitable for field planting.
- ✓ Better seed germination can be obtained by mechanical scarification (with sand paper) of seed coat and keeping these scarified seeds under running water for about 24 hours.

❖ **Vegetative propagation through stem cutting -**

1. Best method of propagation for Guggulu.
2. Cuttings are obtained from healthy and disease free branches.
3. Cutting/ Germ plasma are usually planted during late summer when plant is almost leafless.
4. With the onset of monsoon, when foliation, growth/flowering starts, the plant becomes physiologically active.
5. Cutting also show sign of sprouting in 25-50 days.

- **Time of planting :** 2nd and 3rd week of June is most suitable time for planting of cutting in the beds.
- **Depth of planting :** The stem cuttings are usually planted at a depth of 15-20 cm in soil.
- **Preparation of beds :** Soil must be pulverized and thoroughly mixed with farmyard manure and a small quantity of Aldrin is used to prevent termite infestation. **Beds are prepared in size such as 6'x3' to 10'x4'.**
- **Climatic condition :** It plays a vital role in sprouting of cuttings. Maximum temp 37°C, Minimum temp 27°C, Humidity 76%.
- **Selection and preparation of planting stock :** Stem cuttings should be taken from a healthy plant. Size of cutting 1.5 to 8 cm (girth) x 20 to 100 cm (long).
- **Sprouting of cutting :** Cutting usually sprouts within 8-15 days after planting during monsoon. Cutting treated with hormones (Credik 1,2,3) sprouted more then the control. Credik - 3 is more effective then 1 and 2 as far as sprouting is concerned.

HARVESTING (TAPPING AND COLLECTION) OF GUGGULU

- ▶ After achieving the physiological maturity (8-10 years) of plant, the gum resin is tapped during Mid Dec. to Feb.
- ▶ Because the flow of gum is more during winter and summer.
- ▶ Plant attaining 7.5 cm diameter is suitable for tapping the gum resin.
- ▶ It is done by giving an incision 10 cm long and Usually 1.5 cm deep circular incisions are made on the main branches and stems at uniform distance of 30 cm and at an angle of 60 manually.



- ▶ Incision should not be deeper than bark.
- ▶ It is done by sharp knife.
- ▶ The knife should be dipped in an activator like guggal gum pest.
- ▶ 2-4 incisions given per plant.
- ▶ The yellowish white fragrant latex oozes out through the incision and slowly solidifies into vermicular pieces often forming big lump.
- ▶ Gum is collect after 15-20 days of incision by manually or with spear.
- ▶ Subsequently collection is done at the interval of 10-15 days.

- ❑ **NOTE** - As gum- resin gets hardened on exposure to air, it should be collected in earthen cups fixed below the cut part.
- ❑ 2-3 collections of gum are possible in a season. And after collection, the oleo gum resin is stored in airtight plastic containers.
- ❑ Use of 40 mg of chloro-ethyl phosphoric acid or application of ether, fed to the roots through the injection can increase the flow of gum 22 times and maximize yield significantly.
- ❑ Long term application enhance the production but eventually kills the plant due to exhaustion.
- ❑ **Yield :**
 - ▶ Starting from sixth year, the guggulu gum yield increases from 200 gm to 400 gm per plant.
 - ▶ The mature plant (8-10 years), total guggulu gum yield comes to be 700-900 gm per plant corresponding to 1750 -2250 kg per hac.(@ 2500 plants per hac.)

ENDANGERMENT AND RESCUE

- ▶ According to estimation the annual demand of Guggulu is nearly 1000 tones, while the consumption of this drug is nearly 2300 tones used in various preparations of Indian system of medicine.
- ▶ Because of its medicinal properties, Guggulu has been overharvested in much of its habitat, and also because of its slow growing nature, poor seed setting, lack of cultivation, poor seed and germination rate, the plant Guggulu become endangered and has been listed on the International Union for Conservation of Nature (IUCN) Red List of threatened species.
- ▶ Therefore it is rational to conservation and cultivation of this critical endangered species.

- ▶ And for this, some efforts are in place to address this situation.
- ▶ India's National Medicinal Plants Board launched a project in Kutch District to cultivate 500 to 800 hectares (1,200 to 2,000 acres) of Guggulu, while a grassroots conservation movement called as “SAVE GUGGUL MOMENT”, led by IUCN associate Vineet Soni, has been started to conserve this threatened species by educating Guggulu growers and harvesters in safe, sustainable harvesting methods.



Save guggul movement, started by Vineet Soni in 2008, is an ground level approach to conserve critical endangered plant *Commiphora wightii*. Through this movement, efforts were made to protect guggul plants through community-based and biotechnological approaches. This movement received warm appreciation by various organizations and conservation biologists across the world. Initially this conservation work got financial support from Sir Peter Scott Fund of International Union of Conservation of Nature (Switzerland).



Vineet Soni



Dr. Vineet Soni is a plant biologist who is working to protect threatened plants of Rajasthan state (India) from last 20 years. He did Ph.D. from India and Post-Doctorate from University of Geneva, Switzerland. For his save guggul movement, he has been interviewed by UNESCO, France and profiled as one of the 20 'Earth Movers'.



Save Guggul Movement

Ground level conservation of critical endangered
Commiphora wightii

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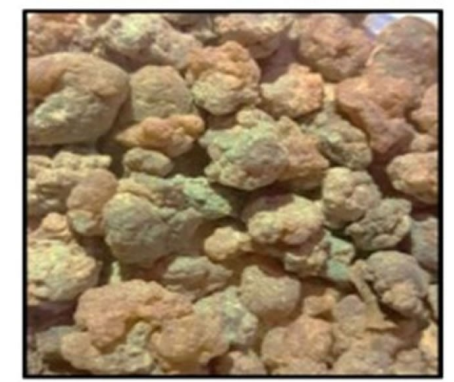
ADULTERANTS

- ▶ There are many adulterants used in gum resin of *Commiphora mukul* for commercial purpose.
- ▶ The Indian adulterants commonly used are gum resin of *Boswellia serrata* and *Hymendictyon excelsum* but out of both, *Boswellia serrate* (Salai guggulu) is major adulterant.
- ▶ The colour and smell of both the gum resins after solidification almost resemble each other, since both the plants belong to the same family *Burseraceae*.
- ▶ Gum resin of *Boswellia serrate* is distinguished by its yellowish green, golden or milky tears, seldom amalgamated into lumps and a characteristic terpentine like odour.

A *Commiphora* (Guggul)



B *Boswellia* (Salai Guggul)



- ▶ The other known adulterants are *Commiphora myrrha*, *C. roxburghii*.
- ▶ Gum-oleo-resin of *Commiphora myrrh*, imported from Africa and constituting the drug Hirabole or bole of commerce is sometimes mixed with Guggulu.
- ▶ Similarly, gum-oleo-resin obtained from *Commiphora roxburghii*, Occurring in central and eastern India is sold by the name of Guggulu.
- ▶ The former is distinguished by large tears of yellowish brown colour, exposing on fracture, a brown surface having white markings will be seen, while the latter has a bluish tinge and a feeble balsamic odour.

PURIFICATION OF GUGGULU

- ▶ **Need of Guggulu shodhana** - As Guggulu is an exudate, external impurities in the form of dust, dry leaves and other foreign materials are accepted in Guggulu. After purification, the herb becomes safer and more effective for use.
- ▶ Traditionally Guggulu is purified in Triphala kvatha for 12 hours (in Dola Yantra) and then fried with ghee before administered internally.
- ▶ According to Nighantu Ratanakar decoctions of Guduchi, Triphala, Vasa and Cow's milk are to be used for purification.



PRASHASTA GUGGULU

- ▶ Snigdha(oily/greasy), mrudu(soft), picchila(slimy), madhura Gandhi(good smell), tikta(bitter), pitabha(yellowish in colour), easily soluble in water, burns well when put on fire, devoid of mud and sand is the best form of guggulu.
- ▶ Shushka(dry),ati-durgandhi(bad odour), vivarna(discoloured), and nirvirya(devoid of potency) guggulu should not be used.

PHARMACOGNOSY

- ▶ The bark is characterized by the presence of silvery, paper like brownish bark peelings.
- ▶ In young branches, the bark is green below the epidermal peelings due to chloroplast.
- ▶ Drug occurs in vermicular pieces of pale yellow or brown coloured mass, makes milky emulsion in hot water and readily burns, when fresh- viscid and golden coloured, odour - aromatic, taste is bitter and astringent.
- ▶ The gum oleo resin is located in gum oleo- resin ducts in the parenchymatous bark as slightly yellowish milky juice.
- ▶ The gum oleo-resin ducts are almost circular and scattered throughout the bark.
- ▶ And in longitudinal section the ducts appear as branched tubular structures.

PHYTOCHEMISTRY:

- ▶ In its chemical composition volatile oil, resins, gum and a bitter compound is found.
- ▶ Guggulu contains gum (32%), essential oil (1.45%), sterols (guggulsterols I to VI, sitosterol, cholesterol, Z- and E-guggulsterone), sugars (sucrose, fructose), amino acids, alpha-camphorene, allyl-cembrol, flavonoids, ellagic acid, myricyl alcohol, aliphatic tetrols are found.



AYURVEDIC PROPERTIES AND PHARMACOLOGICAL ACTIONS

- ▶ According to Ayurveda Literature, Raspanchak of Guggulu are -
 - ❖ Rasa : Tikta, Katu, Kashya
 - ❖ Guna : Laghu, Ruksha, Tikshna, Vishad, Sukshma, Sara (Purana Guggulu) ; Snigdh, Picchala (Naveen Guggulu)
 - ❖ Virya : Ushna
 - ❖ Vipak : Katu
 - ❖ Karam : Tridoshar , Rasayana, Varnya, Jantughan, Nadibalya, Raktaprasadana, Sheetaprashamana, Vrsya (new) and lekhana (old).

▶ According to Bhavprakash Nighantu -

❑ Ayurvedic properties of Guggulu are: -

- ❖ Guggulu is Vishad (non- greasy), Tikta (bitter), Ushna Virya (hot in potency), increases Pitta, Sara (laxative), Kashaya (astringent), Katu (pungent) in taste, Katu in Vipak (pungent after digestion), Ruksha (causes dryness) and Laghu (light).
- ❖ Guggulu is Bhagna-sandhankrid (Unifies fracture), Vrishya (aphrodisiac), Sukshma (enters into minute pores), Swarya (improves voice), Rasayana (rejuvenative), Dipana (appetizer), Balya, mitigates Kapha and Vata, cures Apachi, Medo rog, Meha, Ashmari, diseases of Vata, Pidika, Granthi, Shoph, Arsh, Gandmala, Krimi rog.

- ❖ It mitigates Vata by its Madhura rasa, Pitta by its Kashayatava (astringent taste) and Kapha by its Tikatatvata (bitter taste), so Guggulu mitigates all the Doshas.

गुग्गुलुर्विशदस्तिक्तो वीर्योष्णः पित्तलः सरः ।
कषायः कटुकः पाके कटू रूक्षो लघुः परः ॥
भग्नसन्धानकृद्वृष्यः सूक्ष्मः स्वर्यो रसायनः ।
दीपनः पिच्छिलो बल्यः कफवातव्रणापचीः ॥
मेदोमेहाश्मवातांश्च क्लेदकुष्ठाममारुतान् ।
पिडकाग्रन्थिशोफाशोर्गण्डमालाकृमीञ्जयेत् ।
माधुर्याच्छमयेद्वातं कषायत्वाच्च पित्तहा ॥
तिक्तत्वाद् कफजित्तेन गुग्गुलुः सर्वदोषहा ।

(Bh.pr.3/38-41)

► According to Raj Nighantu -

1. Guggulu is extremely beneficial in the diseases of Vata and Kapha doshas and Kasa rog (cough).
2. It also cures the Krimi rog, Vata rog, Udar rog, Pliha rog, Shoth and Arsh.
3. It has a special potency as a rejuvenative (Rasayan).

गुग्गुलुः कटुतिक्तोष्णः कफमारुतकासजित् ।
क्रिमिवातोदरप्लीहशोफार्शोघ्नो रसायनः ॥

(Ra.ni.12/105)

MEDICINAL USES

- PART USED - Niryas (oleo-gum resin).
- DOSAGE - : 250 mg to 1 gms ; For rasayan purpose - 100 palas (Acc. to Vriddha Vagbhatta) .
- The “Niryasa” means gum-oleo resin, of the Guggulu plant is used for medicinal purpose, both internally as well as externally as mentioned below -
- ❖ Sthaulaya (Obesity) - In obesity, regular use of Guggulu with Gomutra, Triphala, Lauha-Bhasma, Rasanjana, honey is beneficial.
- ❖ Udararoga - Use of Guggulu with milk is beneficial in Udar rog.
- ❖ Shotha (Oedema) - One should use Guggulu with Gomutra or decoction of punanava, Devdaru or Dashmula decoction.
- ❖ Vatavyadhi - Guggulu is the best remedy for Vata covered by Meda. **Gridhasi (Sciatica)**: Rasna 40 gm and Guggulu 200 gm are pounded with ghee and made into pills. It alleviates sciatica. **Krostushirsha (arthritis of knee joint)**: In Krostushirsha, Guggulu or Guduchi with Triphala decoction should be taken.

- ❖ **Urustambha** - Guggulu with Gomutra is a good remedy for Urustambha.
- ❖ **Amavata (Rheumatoid arthritis)** - Intake of Guggulu with equal quantity of Trikatu, Chitraka, Musta, Triphala, and Vidanga destroys all disorders caused by Medas, Kapha and Amavata.
- ❖ **Wound** - Guggulu and Triphala is one of the great combinations in treating, orally, the non healing chronic wounds. Anti-inflammatory and antiseptic properties of Guggulu are beneficial in cleansing and healing of wounds and to reduce oedema. For such, the paste of its gum is applied in the cases of gout, rheumatic joints, glandular swelling and even piles.
- ❖ **Vridhi rog (Scrotal enlargement)** - One should take Guggulu or castor oil with Gomutra. By this chronic scrotal enlargement caused by Vata is destroyed.
- ❖ **Foetid ear** - Fumigation with Guggulu is a good remedy.
- ❖ **Bronchial asthma** - Shallaki, Guggulu, Aguru and Padmaka mixed with ghee is used for fumigation.

CONTRAINDICATIONS DURING GUGGULU ADMINISTRATION

During the administration of Guggulu, the patients should be advised not to take -

- Amla food (sour)
- Tikshna (penetrating)
- Madya (alcoholic drinks)
- Ajirna bhojana (indigestion)
- Maithuna (intercourse)
- Vyayama (exercise)
- Atapasevana (exposure to hot climatic condition)
- Krodha (anger)

अम्लं तीक्ष्णमजीर्णञ्च व्यवायं श्रममातपम् ।
मद्यं रोषं त्यजेत्सम्यग् गुणार्थी पुरसेवकः ॥
(Bh.pr.3/45)

SIDE EFFECTS OF GUGGULU

❑ According to Priya nighantu -

- Excess dose of Guggulu leads to Klaivaya (impotency), Mukhshosh (dryness of mouth), Timira (cataract), Krishta (loss of weight), Murcha (vertigo) and Atisara (dysentery) etc.
- Guggulu should not be used in patients with above complaints.

❑ According to Vriddha Vagbhata -

- He described that about 1 Tula (100 Palas) of Guggulu may be consumed for Rasayan purpose.
- If administered in extensive quantities side effects like: Timira (cataract), Klavaiya (impotency), Krishta (weight loss), Murcha (syncope), Shathilya (laxity of tissue), Roukshya (dryness) may develop.

AYURVEDIC PREPARATIONS OF GUGGULU

- ▶ Triphala guggulu- Triphala Guggulu is a compound extract (of triphala) to which guggulu is added. It is for joint pain, arthritic conditions, muscle aches, rheumatism, and weight loss.
- ▶ Yogaraj guggulu - It is an anti-arthritic herbal supplement useful for joint pain, urino-genital disorders, obesity
- ▶ Mahayogaraj guggulu - It is used in the Ayurvedic treatment of joint diseases, skin diseases, piles, diabetes, gout, fistula, bloating, emaciation, low digestion power, asthma, cold, cough, anorexia, male and female infertility.
- ▶ Gokshuradi guggulu - It is an outstanding remedy in urino-genital problems, promoting urine flow, soothing the mucosa, and aiding in the excretion of stones and calculi. It supports kidney and bladder health, detoxification of the urinary tract and also support against enlarged prostate, urinary tract disorders, urinary Stones, inconsistent urination.

- ▶ Kanchanara guggulu - It can be used to address deep-seated kapha imbalances. It supports healthy tissues including muscles, fat and bones as well as the thyroid and the lymphatic system. It is useful in Tumors and Goitre.
- ▶ Amritadi guggulu - Useful in obesity, lowers cholesterol, also beneficial in other conditions like pimples, puss boils, hair follicle boil and buttock boils.
- ▶ Lakshadi guggulu - It is particularly helpful for healing broken bones, fractures, osteophytes removal. It is really an excellent natural formula to enhance calcium deposition on bones.
- ▶ Simhanada guggulu - Useful for Lack of Appetite, Abdominal gas, Dysentery, Spasm digestion, gout.

- ▶ Trayodashanga Guggulu- Useful in Sciatica and nerve related pain, increase the number of red blood cells and used to promote appetite and digestion, increase the number of red blood cells, and aid in removal of undesirable fat in the body.
- ▶ Kaishora guggulu -It is used as a blood purifier it is helpful in Athlete's foot and helps in elimination of toxins from the joints. It supports healthy metabolism in the body and maintains healthy white blood cells and liver.
- ▶ Navaka guggulu - It is widely used in the Ayurvedic treatment of weight loss, it improves digestion. It is also used to relieve Rheumatoid arthritis.

RESEARCH STUDIES

□ Anti-inflammatory and Anti-arthritic activity :

- Oleo-resin was found to be highly potent anti -inflammatory agent, as compared to hydrocortisone and buta-zoladin against Brownlee's formaldehyde-induced arthritis in albino rats.
- Oleo-resin fraction possessed significant anti-arthritic and anti-inflammatory activities, the minimum effective dose being 12.5mg/100g body weight.
- In arthritis, the extract suppress the activation of inflammatory cytokine and lowers the inflammation. Its also suppresses the activation of interleukins and prostaglandins. and is compared to be more effective then betamethasone.

□ Anti-atherosclerotic activity -

- Effect of gum was observed on serum cholesterol, fibrino-lytic activity and platelet adhesive index in healthy individuals (group I) and in patients of CAD (group II) for a period of 30 days.
- Serum fibrino-lytic activity improved by 22% and 19% at the end of 24 hrs, as after 30 days it was 40% and 30% in group I & II respectively.
- Platelet adhesive index showed 22% and 19% after 30 days in group I and group II respectively.

▶ Anti-obesity activity :

- ▶ Crude Guggulu was found to reduce the body weight of hydrogenated ground-nut oil treated rabbits.
- ▶ Preliminary clinical trials on 22 patients of hypercholesterolaemia associated with obesity, IHD, HTN, DM etc. Guggulu crude was administered orally (6.12mg in three divided doses for 15 days to one month).
- ▶ A fall in total serum cholesterol and serum lipid-phosphorus was found in all the cases treated with Guggulu.
- ▶ The body weight of 10 patients of obesity also found to be reduced significantly.

❑ Hypo-lipidemic activity :

- Typical Guggul-lipid preparations contain 2.5-5% of the plant sterols Guggulsterone E and Z.
- These two components have been reported to exert effects on lipids. To evaluate the effects of Guggul on disorders of lipid metabolism, with special reference to atherosclerosis and obesity, Satyavati et al. conducted the first animal study on rabbits, from 1964-1966.
- It was demonstrated that administration of gum Guggul significantly lowered the serum cholesterol levels of hyperlipidemic rabbits, prevented cholesterol-induced arteriosclerosis and decreased the body weight of the animals.

❑ Cardio-protective effects :

- Several studies have reported the cardio-protective activity of Guggulsterone that showed the reversal of iso-proterenol induced cardiac damage and the associated metabolic changes and protects heart during low blood supply in rats.

❑ Neuroprotective effect :

- Guggulipid reversed strepto-zotocin drug induced neuronal damage and memory deficits.
- In parallel with these reversals, levels of glutathione in the brains of Guggulipid-treated mice were significantly increased, suggesting that Guggulipid inhibits oxidative stress in the brain.
- Guggulipid has an antioxidant and anti-acetylcholine esterase activities; showed protective effect against strepto-zotocin induced memory deficits in the model of dementia.
- These observations suggest Guggulipid as a potential anti-dementia drug and cognitive enhancer.

❑ Thyroid-stimulatory effect:

- Several studies have shown that Guggulsterone stimulates the thyroid gland.
- Administration of Guggulsterone restored thyroid activity like an increase in iodine uptake by the thyroid and enhanced the activities of thyroid peroxidase and protease (thyroid enzyme) as well as oxygen consumption in hypothyroid rats.

❑ Anti-bacterial Activities :

- It has been reported that the essential oil, chloroform extract and seven sesquiterpenoid compounds from the oleo-gum-resin of Commiphora mukul showed the inhibitory action against both gram-positive and gram-negative bacteria. And hence, is effectively used as traditional antibiotics for treating acne.

❑ Anti-Acne effect :

- Guggulipid has been reported to be effective in the treatment of Nodulo-cystic acne.
- Patients with Nodulo-cystic acne had shown progressive reduction in lesions when received Guggulipid for 3 months and patients with oily faces, the acne responded better to Guggulipid.

❑ Antioxidant effects :

- Commiphora mukul extracts have been reported to possess antioxidant properties by inhibits the production of oxygen free radicals and prevents several tissues from damage. It is helpful for oxidative stress associated disease such as heart and nerve damage.

❑ Anti-cancer Activities

- Guggulsterone has been shown to suppress proliferation, invasion, angiogenesis and metastasis of tumour cells.
- Various mechanisms have been suggested to explain the anti-carcinogenic effects of Guggulsterone, including suppression of inflammation and inhibition of nuclear receptors, transcription factors, inflammatory cytokines, apoptotic proteins and cell cycle-related proteins.
- Proliferation: Guggulsterone suppresses the growth and proliferation of a wide variety of tumor cells, including leukemia, head and neck carcinoma, multiple myeloma, lung carcinoma, breast carcinoma and ovarian carcinoma.

- **“Ferulates”** an important bioactive constituent identified from the Guggul gum and play a significant role in in-vitro cytotoxicity by decreasing the cell viability in MCF-7 (breast) tumor cells, PC-3 (prostate) tumor cells, and in parental and transfected P388 cells . Therefore ferulates compounds used in the methods for prevention and treatment of abnormal cell growth and proliferation of inflammation, neoplasia, and cardiovascular disease.

THANK YOU