

CULTIVATION OF GUGGAL AND ITS USES

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Abstract: Guggal is a shrub of xerophytic habitat reaching a maximum height of 4 m with thin papery bark as well as branches are thorny. It prefers arid and semi-arid climates of north india. It is Medicinal plants have been used in virtually all cultures as a source of medicine of which mostly part used Oleo-gum resin. Ayurvedic medicines as a remedy to reduce cholesterol content in blood and therapeutic use is anti-inflammatory and efficacious in the treatment of arthritis. It has alterative and astringent,

Introduction: According to Thappa and Dogra (1994). Guggal or Indian bdellium, is a large spinescent shrub to a small tree and it may be found from northern Africa to central Asia but its inhabiting drier parts of north India. It prefers arid and semi-arid climates and is tolerant of poor soil. Guggal cultivation is done mainly in Rajasthan and Gujarat. A large plantation of guggal exist in Ajmer district of Rajasthan. It is a shrub or small tree, reaching a maximum height of 4 m (13 ft), with thin papery bark. The branches are thorny. Its gum-resin is used in Ayurvedic medicines as a remedy to reduce cholesterol content in blood. It has also utility in treatment of arthritis and obesity.

Family	Burseraceae
Ayurvedic name	Guggulu
Hindi name	Guggal
Trade name	Guggal
Part used	Oleo-gum resin



Distribution:

Guggal is a xerophyte and grows naturally in arid and rocky zones of India, that is, Gujarat, Karnataka, Madhya Pradesh, and

Rajasthan, and also in Pakistan.

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.

Varieties:

- CIMAP (Central Institute of Medicinal and Aromatic Plants), Lucknow, has developed a good oleo-gum-resin-yielding cultivar called 'marusudha'.
- Some studies by CIMAP also indicate the presence of high guggul sterones in the cuttings obtained from Mangaliaswas area of Ajmer in Rajasthan and Kot Lakhpat area of Bhuj in Gujarat.
- The germplasm from Nakoda in Rajasthan also gives a good yield.

Propogating material: A new plantation can be raised from seeds and semi-woody stem-cuttings.

I. By Seed:

Seeds are the major propagation source in nature. In Rajasthan and nearby arid regions flowers and seeds are constantly produced by *C. wightii* except in winter season. April-May seeds are less viable compared to July to September seeds. Monsoon, season creates conducive atmosphere for germination. The temperature after monsoon ranges between 30 - 37°C maximum 20-25 °C minimum with high relative humidity. Approximately, 100 g of black seeds are required for raising plantation in 1 hectare of land at a spacing of 2 m × 2 m. No treatment of seed is required. Only the black-coloured seeds are viable and sown during March to June, preferably in polybags. One seed may produce more than one seedling due to its polyembryonic nature. However, due to poor germination, two seeds are sown in each polybags. Seeds germinate within 7–10 days after sowing in the rainy season.

2. By Cuttings:

It can be successfully propagated vegetatively by stem cuttings. Cuttings are planted in June at a depth of 15 cm for raising them in nursery. Proper soil moisture is necessary for better rooting. The rooting begins after 21 days from 30 cm long stem cutting having 1.5 - 2.0 cm diameter IBA @ 250 ppm) treatment of stem cuttings is beneficial which enhances the rooting to nearly 70% as against 30% under normal conditions. The plants are kept in nursery for 6 months and during the monsoon rooted cutting are transplanted in the field at a spacing of 2x2 meters.

Field preparation:

The land for field planting is well prepared, giving deep ploughing. It is given 20 kg of Aldrin (10%) at land preparation to protect the plants from termite attack. The pits of 50cm × 50cm × 50cm size are dug out at 2m × 2m spacing, accommodating 2,500 plants/ ha. The pits are filled with well-rotten farmyard manure mixed with a table spoon. The pits are given soaking irrigation before planting, followed by one irrigation/month till next rainy season. Use of N and P does not give any positive response either on growth or gum yield. But low level of irrigation gives positive response in registering high rate of growth in Rajasthan and Gujarat.

Irrigation and Weeding:

C. wightii require irrigation after its establishment. In the scarcity of rain, up to 5 years, plant is in need of irrigation during winter season. During summer seasons at the age of 8 years when the plant attains full maturity it requires irrigation at least 2-3 times during summer and winter season. During rainy season, weeds occur in the crop. The excessive weeds-check the nutrition supply to the plant. The weeding is beneficial in the month of September and December.

Pruning guggal:

Wherever, annual pruning of lateral branches is carried (leaving only 2–4 branches), the bushes attain better height and larger girth of main trunk and lateral branches in a shorter duration. The plantations are given 1–2 weeding-cum-hoeings in a year.

Tapping and Collection of guggal:

The plants attain 3–5m height in 7–8 years and 3–4cm thick main trunk and some lateral branches. The trunk is ready for tapping during autumn season (December–February). The tapping is done by giving 9–11cm long triangular or circular cut, 40cm above the

ground. The depth of the cut should never exceed the thickness of the bark, as resin ducts inhabit this part and may injure phloem and cambium part, causing damage to trees besides obstructing outflow of gum-resin. A paste of gum-resin in water is applied at the incised spot and bandaged to potentiate flow of gum-resin (guggal). The flow of gum starts 3–7 days after tapping and is exhausted in next 15–20 days. Since gum-resin gets hardened on exposure to air, it is collected in earthen cups fixed below the cut part. Two to three collections of gum are possible in a season. Use of 40mg of ethephon (2-chloroethyl phosphoric acid) fed to the roots through injection can increase the flow of gum and maximize yield significantly. The yield of a tree may vary from 200–500g/ season. However, tapped branches or the entire tree die 8–10 months after yielding the gum.

Grading of guggal:

The best grade of guggul is collected from the thick branches of tree. These lumps of guggul are translucent. Second grade guggul is usually mixed with brack, sand and is dull coloured guggul. Third grade guggul is usually collected from the ground which is mixed with sand stones and other foreign matter. The final grading is done after getting cleansed material. Interior grades are improved by sprinkling castor oil over the heaps of the guggul which impart a shining appearance.

Plant Protection in guggal:

Plants are often affected by termites particularly in summer season. Termite causes severe damage to the plant by making holes through buried ends of the stem or root. The infested plants become dry showing yellow appearance of leaves and eventually result in death of the plants.

Some of the control measures are as follows

1. Destroying the termitorium by using kerosene or calcium disulphide.
2. Use of mercuric chloride (0.25 %) or copper sulphate (0.55%) in aqueous solutions is effective in controlling the termites.
3. Dusting of 250 gm of gamaxene (B.H.C. 10 %) in the soil of each pit at the time of planting is also used as preventive measures for termites.

Chemical Constituents:

The resin is transparent in the form of thin film but transparent or even opaque in bulk. It is completely soluble in most of the organic solvent and in castor oil drying and turpentine oil. It mixes with stearic acid, vegetable waxes and resins.

The essential oil (0.38%), obtained by steam distillation of oleo - resin of *C. weightii* is composed of chiefly terpenes like myrcene (64%), dimyrcene (11%) polymyrcene and cryophylene.

Yield of guggal:

Starting from sixth year the guggul gum yield increases from 200 gm to 400 gm per plant. The total guggul gum yield within five year comes to be 1600 gm per plant corresponding to 3200 kg per ha @ 2000 plants per ha.

Adulterants: As per Thappa and Dogra (1994).

The oleo gum - resin of *Commiphora wightii* is commonly adulterated with resin of *C. myrrh*, *C. abyssinica*, *C. sehimphera*.

Sr.no	Botanical Name	Common Name
1.	Albizzia lebbek	Siris
2.	Butea monosperma	Palas
3.	Moinga oleifera	Sahjan
4.	Acacia Arabica	Babool
5.	Acacia catechu	Kher
6.	Sterculia ureus	Kathira
7.	Acacia Senegal	Kikkar

Medicinal uses: as supported by Kimura *et al.* (2001) & Nityanand and Kapoor (1971).

Guggal has been utilized as medicine from very ancient time as ayurvedic treatment. It has several medicinal properties, which are useful for the treatment of several chronic and common diseases. The medicinal value of guggal includes:

1. It helps in reducing the extra fat of body and thus helps in controlling the obesity.
2. It helps in controlling the cholesterol level of body.
3. It stimulates the production of RBCs and WBCs in the blood and thus makes immune system strong.
4. Guggal is an excellent blood purifier and use for treatment several skin diseases.
5. It releases arthritis pain and other. It stimulates the secretion of digestive juice in the stomach and hence improves the digestive system of body.
6. It is quite effective in case of mensuration disturbance and pain menses.
7. Guggal is use for treatment of constipation and digestion.



Therapeutic uses: Nityanand and Kapoor (1971).

- The gum of guggal is anti-inflammatory and efficacious in the treatment of arthritis, rheumatism, hyperlipidemia, thrombosis, and hypercholesterolemia.
- It has alterative, carminative, astringent, and antispasmodic properties.

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