

Cultivation and Conservation of Guggulu (*Commiphora mukul*)

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Abstract: Guggulu (*Commiphora mukul*) is about 2-3.5 mt heighted plant of Burseraceae family. The plant grows wild in the arid, rocky tracts, also in low rainy and hot areas. The part used in medicinal preparation is resin, collected by tapping the barks. Guggulu deserves high values in Ayurvedic medicines. Guggulu is Rasayana, Vatakaphaghna, and used in various diseases. Due to high values and excessive demands, improper methods of collection, uncontrolled forest destruction and poor knowledge of cultivation; number of plants highly decreased. Now it categorized as threatened plant. Hence cultivation and conservation of this plant is necessary. Guggulu can be propagated by seed and vegetative method. Germination through seed is very poor. Vegetative propagation through stem cutting is most common and successful method. Farming care is also necessary for proper growth. Conservation can be effected by knowledge of collection methods and awareness.

Keywords- *Commiphora mukul*, tapping, cultivation, Germination, Vegetative propagation, Conservation

Introduction:-

Guggulu (*Commiphora mukul*) is about 2 - 3.5 mt. heighted plant. The plant grows wild in the arid, rocky tracts, also in low rainy and hot areas. It is found in South Africa, mid Asia, in India Rajasthan, Chhattisgarh, and Karnataka and in forests of Maharashtra. The part used in medicinal preparation is resin (*Niryasa*). It is collected by tapping the barks of 7 8 yr plants in winter season. If this process does not do properly then the plant may die.

Guggulu deserves high values in Ayurvedic medicines known as 'Guggulu kalpas'. There are more than 100 Guggulu kalpas are mentioned in Ayurveda. Guggulu is Rasayana, Vatakaphaghna, and used in various diseases like all types of arthritis, Vatavyadhis, obesity, skin diseases, Medoroga, Vatarakta, Shotha, Hrudroga etc.

In short Guggulu is an integral part of Ayurvedic treatment. It is also used in Unani and Sidhha. Due to such high values and excessive demands, improper methods of collection, uncontrolled forest destruction and poor knowledge of cultivation number of plants highly decreased therefore now it categorized as threatened plant. That is why cultivation and conservation of this plant is necessary.

Plant Profile:-

- **Family** - Burseraceae
- **Latin name** - *Commiphora mukul*
- **English name** Gum-Guggulu / Indian bedellium
- **Sanskrit name** Guggulu, Devdhupa, Kaushik, Pur, Palankash

• Common trade name Myrrh

• **Habitat** Shrubby 1.2 1.8 m high, young parts glandular, pubescent branches knotty and crooked, divaricated, usually ending in a sharp spine.

Leaves - 1-3 trifoliate, rhomboid ovate, serrate toothed in upper part.

Flowers Fascicles of 2-3 pedicles very short.

• **Types according to Ayurveda** According to Bhavmishra and Kaiyadeva Nighantu, the types of Guggulu are classified on the basis of colour. They are

i) Mahishakshya

ii) Mahaneela

iii) Kumud

iv) Padma

v) Kanak

• **Place of Distribution** Bellary, Mysore, Deccan, Khandesh, Rajputana, Baluchistan

• **Parts used** Resinous gum

• **Chemical Composition** Steroids - C₂₁ or C₂₇ with major Z and E-Guggulusterone, Guggulu contains resin, volatile oil, and gum. It contains 50 compounds.

Need for Cultivation:

1. Now a day it is becoming an endangered species due to its excessive tapping for extraction of gum.
2. No efforts have been made for regeneration and forestation of these degraded habitats in nature.

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3. Its cultivation is beset with many problems like its slow growth, spinescent and profuse branching. So it is not cultivated easily and hence lacks attention.
4. Also because of its specific demand for certain bio-edaphic factors, there is a need to invent a non-destructive procedure of extraction of gum (i.e., extraction without killing the plant).
5. In order to save this species from getting extinct in nature, it should be paid due attention.
6. To build up alternative source through plantation to meet future needs of the drug industries.
7. To encounter the problems in cultivation of *Guggulu*.

Germ Plasm Collection:

- It is an important part of collection.
- It provides best quality of planting material through selection of characters present in wild stocks of different areas.

Collection made with following objectives:

1. Selection of superior *guggulu* clones from different regions.
2. To select vigorous and fast growing clones.
3. To select the clones with high quality and yield of gum.
4. To find out suitable areas where seed germination is high in nature.

Propagation:

Regular propagation of *guggulu* can be done by the following methods: -

- A. Through seeds.
- B. Vegetative propagation (Through stem cuttings).
- C. Air layering.
- D. Tissue culture.

A. Through Seeds: -

1. Regeneration through Seeds in *Guggulu* is very poor.
2. In nature, very few seedlings develop from seeds.
3. If the seedlings develop from seeds they may be through dispersed seeds and often found growing mostly in the thickest of *Euphorbia caducifolia*.
4. If the plant is raised through seeds having deep root system, they grow slowly.
5. If the plant is raised through cutting the ones, which have shallow root system, they grow fast.

B. Vegetative Propagation [Through Stem Cuttings]

- Best method of propagation for *Guggulu*.
- Cuttings are obtained from healthy disease free branches.
- Cutting / Germ plasms are usually planted during late summer when plant is almost leafless.
- Plant becomes physiologically active when Monsoon starts and at that time Foliation and growth / flowering

starts.

Cutting also show signs of sprouting in 25-50 days.

a) Time of planting: - 2nd and 3rd week of June is most suitable time for planting of cuttings in the beds.

b) Depth of planting: - The stem cuttings are usually planted at a depth of 15 to 20 cm. in soil.

c) 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'x 3' to 10'x 4'.

d) Climatic condition [Temperature and humidity]

- It plays a vital role in sprouting of cuttings.
- Maximum Temp 37°C, Minimum Temp 27°C, Humidity 76%

e) Selection and preparation of planting stock: -

- Stem cuttings should be taken from a healthy plant.
- Size of cutting 1.5 to 8cm. (girth) x 20 100cm. (Long)

f) Sprouting of cutting: -

- Cutting usually sprouts within 8-15 days after planting during monsoon.
- Cutting treated with hormones [Credik 1, 2, 3] sprouted more than the control.
- Credik - 3 is more effective than 1 and 2 as far as sprouting is concerned.

C. Through Air layering: -

- Propagation of *Guggulu* through seeds is very difficult, while the mortality rate in stem cutting is too high.

- Therefore Air-layering is successful but in practical stem cutting method is commonly used.

Method: -

- i) It involves production of individual usually on stems before they are severed from parent plant.
- ii) A firm healthy branch is selected.
- iii) It should be about 60 90cm. long under a leaf bud or node and a 5 cm ring on the wood is marked.
- iv) The bark of marked portion is removed from stem or branch.
- v) The exposed portion is covered by ball of adhesive soil.
- vi) Bandaging firmly all round the branch.

Advantage: -

- New individual product in just 2 3 months.
- Use of hormones and expensive equipments are not required.

Suitable season: -

- 1) July to September
- 2) Climate Temp 33°C, Moisture 70- 80 %
- 3) Soil - Peat soil or a soil mixture of adhesive soil

D. Tissue Culture: -

- Tissue culture In situ means of propagation.
- Very little work has been done on this method on *Guggulu* according to information available.

Cultural practices: -

1) Transfer of rooted cuttings / plant: One-year old established rooted cuttings are transferred into 40 cm x 20 cm polythene bags filled with soil mixture.

2) Weeding: -

- Done for plantation without disturbing natural flora
- Growths of some other plants are harmful so it should be uprooted and destroyed.

3) Extraction of guggulu gum: -

- *Guggulu* gum or the gum oleoresin is a natural exudate of *Commiphora mukul*.
- The flow of gum is more during winter and summer when the plant is injured due to tapping.

Methods: -

Tapping: -

1. It is done by giving an incision 3” 4” long on the main trunk of the plant.
2. It is done by sharp knife.
3. The knife should be dipped in an activator like *Guggulu* gum paste.
4. Eight year or more than 8yr. old plant is selected.

5. Incision should not be deeper than the bark

6. 2-4 incisions given per plant.

7. Yellow Latex oozes out through wound and slowly solidifies into vermicular pieces often forming big lump.

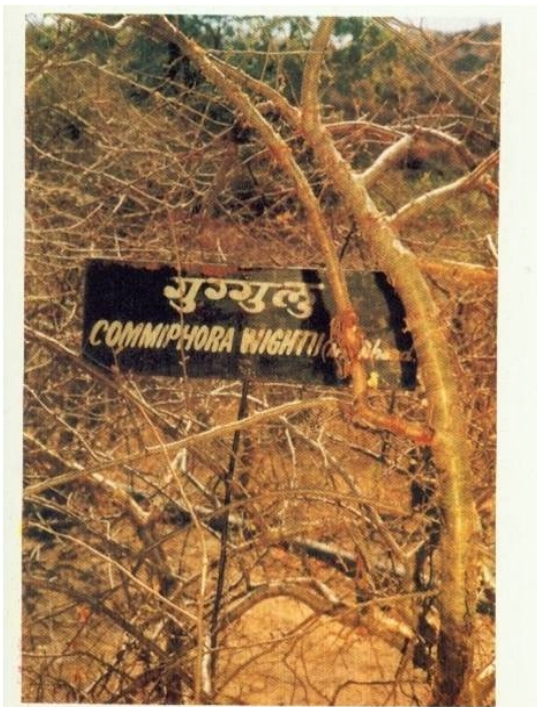
8. Gum is collected after 15-20 days of incision and subsequent collection is made at an interval of 10-15 days.

Other experimental methods are there in which activators are used and because of that exudation increases.

Conservation

Need for conservation -

- It is one of the threatened species, which is becoming rare day by day.
- This is due to human impact on forest including over exploitation and increasing biotic interference in the forest.
- The slow growth of this plant is also one of the main causes.
- The regeneration is almost negligible.
- It is widely distributed species.
- So conservation of such species can be primarily done by preserving and protecting forest wealth in a more forceful and earnest way.



A view of Guggulu plant showing a rooted branch with well developed roots through air layering seen in the centre.



Photograph showing well developed roots through 'air layering' with the application of Cerdik-2 hormone.

Criteria for Conservation -

1. More stress should be given for establishment of *Guggulu* farms both in govt. and private sectors.
2. Efforts may also be made to propagate the plants in the laboratories by tissue culture.
3. We should try to encourage various Institutions and organizations to cultivate and preserve the 'germ plasm' of *guggulu*.
4. Termite attack observed on the plants dying after tapping gum so advance methods should be developed for that.
5. New methods should be done for increasing the gum resin quantity.
6. After tapping gum the plant gets died, so there is a need to develop the method to keep the plant live even after tapping.

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