

GOOD STEWARDSHIP HARVESTING OF **BOSWELLIA** (*Boswellia serrata* Roxb.)

Boswellia serrata Roxb. is one of 28 species in the *Boswellia* genus, family Burseraceae. *B. serrata* is the only member of the genus that is native to southeast Asia, where it occurs in dry tropical deciduous forests of India and Pakistan. *B. serrata* is a medium-sized deciduous tree that can grow up to 18 meters in height and 180 cm in girth with ash-colored papery bark and alternately arranged pinnate leaves with 8-15 toothed leaflets. Tiny, cream-colored flowers are borne on 10-15 cm long racemes in the leaf axils. Fruits are 2 cm long and 3-cornered. *B. serrata* occurs on flat land, as well as slopes and ridges in altitudes up to 1150 m and can be found in the states of Madhya Pradesh, Jharkhand, Andhra Pradesh, Orissa, Gujarat, Punjab, Assam, Rajasthan, and Karnataka, with commercial harvest mainly occurring in Madhya Pradesh.

The gum-resin from *B. serrata* is medicinal and is used within Unani, Ayurvedic, and western medicinal traditions. The aromatic and medicinal resin is produced by *B. serrata* as a protective response to injury and harvesters obtain the resin by collecting naturally occurring exudate and/or employing cutting techniques to stimulate gum resin production.

Common names of *B. serrata* resin: Indian frankincense, Indian olibanum, 'Salai guggal'



B. serrata dried gum resin (photo credit: Saklani)

IMPORTANT INFORMATION

Right to Harvest

In India, *Boswellia serrata* is harvested by a number of indigenous communities for whom it is a primary livelihood. The resin-producing trees are government owned or owned by local communities or through community-based land tenure. Government ownership is reported to be predominant in Madhya Pradesh though the trees are also owned by the indigenous families. Individual tribal collectors of *B. serrata* have inherited or been assigned a certain number of trees by their communities, which they tap, harvest, and maintain. Sustainable trade of this commodity is imperative for sustaining local communities and cultural traditions. Under existing Indian government acts, only indigenous populations living in the forest areas can tap and collect the gum and outsiders do not have access to these activities.

Conservation Status

According to a report presented at the 19th Conference of the Parties of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in 2022, *B. serrata* is the species in the genus of least conservation concern and is widespread in India. The main concerns reported are habitat loss through clearing of woodlands where *B. serrata* populations are dominant for farming, and poor recruitment of young *B. serrata* trees into the population due to grazing and browsing by livestock. Mass felling of mature *B. serrata* trees in the 1970's for pulpwood production also had a long-term impact. At this time, no *Boswellia* species is listed in any CITES Appendix.

This same report indicated that a recent inquiry by CITES into prominent commercially traded *Boswellia* species in Africa and Asia concluded that traditional tapping methods used by tribal people, when carried out correctly, do not damage mature trees. The methods can vary somewhat by region, but key characteristics of sustainable resin harvest are that it is seasonal, with mild to moderate intensity tapping, and occurring in areas with strong land tenure (i.e., oversight).



Boswellia tree (photo credit: Flowerman)

GOOD STEWARDSHIP CHECKLIST

- ✓ Perform tapping during the traditional season of November or December through April. Tapping too early or too late may cause reduction in resin quality and quantity. Exact timing is location and weather dependent.
- ✓ Do not harvest during the rainy season from May through October or November. This allows a period for tree rest and recovery.
- ✓ Use rotational management to allow trees to rest, ideally for 1-2 seasons between harvests.
- ✓ Tap to a depth of 0.25-0.5 cm maximum. The resin canals of *Boswellia serrata* trees are shallow. If tapping is too deep, the resin canals are bypassed. This is injurious to the tree and the wound will not produce resin.
- ✓ Tapping should be performed on the trunk of the tree and not on the branches.
- ✓ Tap only mature trees. Optimal harvest yield occurs in *B. serrata* trees that are 35-60 years of age.

For information on qualifying and assessing buyers, refer to AHPA's Good Agriculture and Collection Practices (GACP) tools.

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GOOD STEWARDSHIP HARVESTING GUIDELINES

Tree Selection

- Trees may be harvested once they reach about 15 years of age, and are a minimum girth of 61 to 90 cm, depending on geographic location.

Variations in minimum girth relate to location-specific growing conditions such as altitude, soil conditions, climate, topography, etc. that may affect the average size of a mature tree in a given area.

On average, one mature *Boswellia serrata* tree yields about 1.5–2.5 kg of gum resin in a year.



Tapping

- Harvest of *Boswellia serrata* oleo gum resin occurs through artificial wounding of the tree, known as “tapping.” Shallowly tapping the tree exposes resin glands and stimulates resin production. The artificial wound is called an incision.
- Tapping should be performed at a height of about 1.5–2 meters above ground level and extend upward. Some less common sustainable tapping techniques may start at 15 cm above the ground; however, tapping low to the ground increases risk of contaminants during collection.
- A process called “freshening” is performed two or more weeks after the initial wounds are made. During this process the incision is reopened by scraping at the time of a resin harvest. This stimulates continued resin production.
- Freshening can be performed up to two times per week, and up to a depth of 0.25–0.5 cm at each freshening for the remainder of the harvest season.

Tapping is usually performed with a long, wood-handled sickle bladed tool called a “saluli”, and/or a wooden-handled adze. Other terms for tapping include scraping, scratching incision, or wounding.

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COLLECTION/GATHERING, POST-HARVEST HANDLING & PROCESSING

- Fresh resin oozes out of the cut resin ducts and forms 5–8 cm long tears.
- Harvest resin from the wound when it is hardened or semi-hardened and no longer sticky, generally after a 2–4 week waiting period.
- For collection of resin from the tree, use collection containers designed to prevent contaminants (animal droppings, soil, etc.) from entering.
- Consolidate collected resins in large twig baskets at local collection sites. Baskets are woven of materials from local tree or plant species.
- Full baskets of resin are sewn two together to form a protective ball, and then packed inside jute bags for transport to large collection centers for processing.
- Transport resins after dark or in early morning to avoid heat and light and preserve volatile compounds.
- Manually remove bark and other impurities at the collection centers and grade the resin (see “Grading”). Pack resin into high-density polyethylene (HDPE) sacks* for transport to manufacturers or end-users.

*HDPE sacks are used to prevent contamination of materials. All plastics used through this process are recyclable and should be recycled.



EXTRACTING “RAS” & FURTHER PROCESSING

- Some materials will go through further processing to remove “ras” – which is a brown liquid rich in boswellic acids and used by the extraction and incense industry, fetching prices almost double that of the resin.
- “Ras” is removed from the resin by placing bags containing resins in a shaded and dry area for one month during which the fluid portion of the resin can drip down into separate collection containers.
- “Ras” makes up 8–10% of the raw material and follows a separate supply chain. It is the liquid that flows down from the resin while it is drying in bags during the hot summer months.
- The remaining solid to semi-solid resin can be treated with soapstone powder to assist with hardening and/or broken into smaller pieces.
- Further manual removal of barks and other impurities is performed at this time, then the resin is graded (see “Grading”).

GRADING

- Super fine grade / Khada:** large pieces transparent and yellowish brown in color. Free of moisture, bark and other impurities. No powder.
- Quality I / Batana:** slightly brownish in color and transparent, no impurities but slightly inferior quality compared with super fine grade
- Quality II / Gol kani:** deeper brownish and transparent, free of moisture, may contain a small amount of bark
- Quality III / Bajra dana:** brownish to greenish in color, transparent or opaque with more impurities that cannot be separated from the resin. No moisture.
- Powder / Rava dana:** coarse to fine powder, mixed with bark and other impurities, difficult to separate.

Also produced:

- Telcom powder:** used for making incense.
- Chipti (separated bark):** used for puja (prayer) and other ceremonial purposes.

This is a traditional grading system. Modern end-users select appropriate grades for their manufacturing needs and may bypass some of these grades.



1. Khada; 2. Batana; 3. Gol kani; 4. Bajra dana; 5. Rava dana; 6. Telcom powder; 7. Chipti (photo credit: Saklani)