

Boswellia (*Boswellia carterii*)

Common Names: Frankincense, mastic, olibanum, salai gugal, dhup, or Indian olibanum.

Location: This herb's origin is in the Middle East.

Description: The gummy extract from the tree is taken out, purified, and then turned into resin for medicinal use.

Properties: This herb is an anti-inflamant, pain reliever, and antiarthritic.

Uses: Boswellia can be used to treat arthritis, dry skin and ulcerative colitis.

Doses: You can find this herb in extract form.

Warnings: Some side effects include diarrhea, nausea and skin rash. Do not take this herb if you are pregnant, nursing, or a young child. Also, do not take this herb if you are suffering from kidney or liver disease.

Also known as

Boswellia carterii, Olibanum, Indian Frankincense, Arabic Frankincense, and Salai guggal

Introduction

Frankincense and the oil produced from it has been known for its healing powers and its ability to improve communication with the creator in the Middle East for thousands of years before it was made a gift of to Christ by the Magi. There are over 52 references to it in the Bible. Egyptian records show a great many references to it including its use in cosmetics, perfumes and as an embalming agent. The Chinese used it as part of a treatment for leprosy. Grown predominantly on the Somali coast and parts of the Arabian Peninsula, the resin is obtained by making deep cuts in the trunk of the tree lengthwise. Below this incision a narrow strip of bark is peeled off allowing the sap to run out, and as it touches air it begins to harden. It takes approximately three months to harden into the yellow "tears" that we are used to seeing will be sold at market. The sap is gathered from May until the rain showers start in September.

Constituents

The venerable herbalist Mrs. Grieve noted that the constituents of frankincense as follows: resins (65%), volatile oil (6%), water soluble gum (20%), bassorin (6-8%), and plant residue (2-4%). The resins contain boswellic acid and alibanoresin.

Parts Used

Dried resin, collected from stems and trunk.

Typical Preparations

Powdered resin added to water, tincture, and very rarely as a tea. For internal use, sometimes mixed with myrrh or cress. In aromatherapy, frankincense is compatible with bergamot, cinnamon, clary sage, geranium, grapefruit, jasmine, lavender, lemon, myrrh, neroli, orange, patchouli, pine, rose, sandalwood, tangerine, and ylang ylang. In Ayurvedic medicine, frankincense is combined with

turmeric to make teas, tinctures, or encapsulations for treating arthritis and muscle pain.

Summary

Frankincense is traditionally used to treat coughs. Modern research confirms that it contains phytochemicals that stop the production of leukotrienes that cause constricted airways and inflammation. Frankincense is often described as a stimulant, but its action are only similar to those of stimulants in relieving the symptoms of asthma, bronchitis, colds, and flu. It is currently being researched and used therapeutically in hospitals in Europe

Precautions

If you take a blood thinning medication such as Coumadin, Plavix, or Trental, do not take frankincense directly (in whole form) by mouth. Frankincense should not be applied to broken or abraded skin.

Botanical: Boswellia Thurifera

Family: N.O Burseraceae

- [Description](#)
- [Constituents](#)
- [Medicinal Action and Uses](#)

---**Synonym**---Olibanum.

---**Part Used**---The gum resin.

---**Habitat**---Arabia, Somaliland.

---**Description**---Obtained from the leafy forest tree *Boswellia Thurifera*, with leaves deciduous, alternate towards the tops of branches, unequally pinnated; leaflets in about ten pairs with an odd one opposite, oblong, obtuse, serrated, pubescent, sometimes alternate; petioles short. Flowers, white or pale rose on short pedicels in single axillary racemes shorter than the leaves. Calyx, small five-toothed, persistent; corolla with five obovate-oblong, very patent petals, acute at the base, inserted under the margin of the disk, acstivation slightly imbricative. Stamens, ten, inserted under the disk, alternately shorter; filaments subulate, persistent. Anthers, caducous, oblong. Torus a cupshaped disk, fleshy, larger than calyx, crenulated margin. Ovary, oblong, sessile. Style, one caducous, the length of the stamens; stigma capitate, three-lobed. Fruit capsular, three-angled three-celled, three-valved, septicidal, valves hard. Seeds, solitary in each cell surrounded by a broad membranaceous wing. Cotyledons intricately folded multifold.

The trees on the Somali coast grow, without soil, out of polished marble rocks, to which they are attached by a thick oval mass of substances resembling a mixture of lime and mortar. The young trees furnish the most valuable gum, the older yielding merely a clear, glutinous fluid, resembling coral varnish.

To obtain the Frankincense, a deep, longitudinal incision is made in the trunk of the tree and below it a

narrow strip of bark 5 inches in length is peeled off. When the milk-like juice which exudes has hardened by exposure to the air, the incision is deepened. In about three months the resin has attained the required degree of consistency, hardening into yellowish 'tears.' The large, clear globules are scraped off into baskets and the inferior quality that has run down the tree is collected separately. The season for gathering lasts from May till the middle of September, when the first shower of rain puts a close to the gathering for that year.

The coast of Southern Arabia is yearly visited by parties of Somalis, who pay the Arabs for the privilege of collecting Frankincense, and in the interior of the country, about the plain of Dhofar, during the southwest Monsoon, Frankincense and other gums are gathered by the Bedouins. (The incense of Dhofar is alluded to by the Portuguese poet, Camoens.)

[\[Top\]](#)

---Constituents---Resins 65 per cent, volatile oil 6 per cent, water-soluble gum 20 per cent, bassorin 6 to 8 per cent, plant residue 2 to 4 per cent; the resins are composed of boswellic acid and alibanoresin.

---Medicinal Action and Uses---It is stimulant, but seldom used now internally, though formerly was in great repute. Pliny mentions it as an antidote to hemlock. Avicenna (tenth century) recommends it for tumours, ulcers, vomiting, dysentery and fevers. In China it is used for leprosy.

Its principal use now is in the manufacture of incense and pastilles. It is also used in plasters and might be substituted for Balsam of Peru or Balsam of Tolu. The inhalation of steam laden with the volatile portion of the drug is said to relieve bronchitis and laryngitis.

The ceremonial incense of the Jews was compounded of four 'sweet scents,' of which pure Frankincense was one, pounded together in equal proportion. It is frequently mentioned in the Pentateuch. Pure Frankincense formed part of the meet offering and was also presented with the shew-bread every Sabbath day. With other spices, it was stored in a great chamber of the House of God at Jerusalem.

According to Herodotus, Frankincense to the amount of 1,000 talents weight was offered every year, during the feast of Bel, on the great altar of his temple in Babylon. The religious use of incense was as common in ancient Persia as in Babylon and Assyria. Herodotus states that the Arabs brought every year to Darius as tribute 1,000 talents of Frankincense, and the modern Parsis of Western India still preserve the ritual of incense.

Frankincense, though the most common, never became the only kind of incense offered to the gods among the Greeks. According to Pliny, it was not sacrificially employed in Trojan times. Among the Romans, the use of Frankincense (alluded to as *mascula thura* by Virgil in the *Eclogues*) was not confined to religious ceremonials. It was also used on state occasions, and in domestic life.

The *kohl*, or black powder with which the Egyptian women paint their eyelids, is made of charred Frankincense, or other odoriferous resin mixed with Frankincense. Frankincense is also melted to make a depilatory, and it is made into a paste with other ingredients to perfume the hands. A similar practice is described by Herodotus as having been practiced by the women of Scythia and is alluded to in Judith x. 3 and 4. In cold weather, the Egyptians warm their rooms with a brazier whereon incense is burnt, Frankincense, Benzoin and Aloe wood being chiefly used for the purpose.

The word 'incense,' meaning originally the aroma given off with the smoke of any odoriferous substance when burnt, has been gradually restricted almost exclusively to Frankincense, which has always been obtainable in Europe in greater quantity than any other of the aromatics imported from the East.

There is no fixed formula for the incense now used in the Christian churches of Europe, but it is

recommended that Frankincense should enter as largely as possible into its composition. In Rome, Olibanum alone is employed; in the Russian church, Benzoin is chiefly employed.

The following is a formula for an incense used in the Roman Church: Olibanum, 10 OZ. Benzoin, 4 oz. Storax, 1 OZ. Break into small pieces and mix.

Frankincense Resin

Frankincense makes a really nice fresh gum to chew to clear the head and freshen the breath as well as many medicinal uses.

I occasionally like to both burn and chew Frankincense and I know it's really good for joint problems and as a lung expectorant from experience.

Burning it on a charcoal coal in an incense burner does seem to clear the space.

Medicinal Attributes (see disclaimer below)

Widely used as an anti-inflammatory in many cultures and fast becoming popular in the West for such treatments. The University of Munich conducted a study that found frankincense very effective treatment to relieve joint pain. Ancient herbal books recommend suspending painful joints over the smoke of equal parts of frankincense, mastic and lavender. Frankincense is antiseptic, anti-inflammatory and an expectorant to the lung, genital, urinary and digestive tracts. It has been used extensively as an anti-bacterial and anti-fungal treatment and has proven excellent for mature skin and acne and to heal wounds and scars. It is very useful to those suffering from asthma. The gum was often crushed, mixed with myrrh and dried aloe juice to make an antiseptic powder for wounds. The astringent bark of the tree was dried and ground and taken as a stimulating and cleansing infusion. Frankincense was often used as a diuretic by chewing the resin or adding it to coffee. It was also chewed to relieve the head of mucus and to disperse phlegm. Humans and animals were exposed to the smoldering gum as treatment for many illnesses. In ancient Arabia, the gum was ground and made into pills for those who displayed symptoms of spitting up blood (most likely digestive disorders). Frankincense was used in the treatment of almost every imaginable disease by Greek and Roman physicians and many remedies appear in the Syriac Book of Medicine, ancient Muslim texts, and in Indian and Chinese medical writings.

Other Uses Frankincense has been widely used for thousands of years in many parts of the world for burning as incense in religious ceremonies. Historically this has been done for several reasons; first it acts as a fumigant in a crowded space where disease might spread. Second, it has been shown to improve acoustical properties in a space. Lastly, its smoke travels upward to the heavens as does one's prayers and in this way is regarded as a fragrant gift to the gods.

Olibanum resin is also distilled to yield its volatile oils for use in perfumes, soaps, lotions, creams and detergents. Solvent extracts are also prepared and both resinoids and absolutes are used in the same as fixatives. It is the key base ingredient in the world famous Arabian perfume called "Amourage".

Frankincense is a natural insecticide and was used in ancient Egypt to fumigate wheat silos to keep wheat moths away. The resin is also steamed and able to kill parasitic insects in food. The fumes from

burning the resin is also said to repel mosquitos and sand flies.

Burning the resin has cooling effects and was recommended by the famous 11th-century Arabian physician, Avicenna, as a remedy for illnesses that increased the body's temperature and for infections.

The inner white root of a young plant was chewed for thirst-quenching purposes as well as a food. The leaves of the tree were often gathered to feed to weak and even favoured livestock. Frankincense was also added to wine as a perfume though it is said that drinking too much of this would cause madness and even death. This wine was often given to inmates about to be executed in order to numb the pain and terror.

Soaking high quality resin overnight in water with a piece of iron and then drinking the resulting liquid in the morning was said to greatly improve memory.

The resin was also used as an adhesive, where the soft gum was applied to cracks or chips in utensils and other items, which then hardened to make a waterproof mend.

The soot from burnt frankincense was used to make permanent stains on the skin by using needles to create tattoos.

Fresh gums were moulded into large cone-shapes and ignited as darkness fell to provide a candle type of light that would burn for hours.

Dioscorides described how the bark of the tree was put into water to attract fish, luring them into nets and traps.

In ancient Egypt, the resin was used as a key ingredient for embalming their dead.

Frankincense is said to cleanse a space of negative energies.

Frankincense and myrrh are without a doubt the worlds two most important resins. Although other resins, such as pine, copal, styrax, and dragon blood have played important roles in ethnobotanical medicine, none have been as widely distributed and universally utilized, as economically important, or so highly regarded. This paper presents an overview of these valuable trees and the history, culture, and some of the medical uses of their resins.

Ancient Frankincense and Myrrh Trade

The earliest history of frankincense and myrrh trade is shrouded in myth. The gum-bearing trees were said to be guarded by fierce red snakes which leaped into the air to inflict fatal bites on any intruder. The trees were believed to grow in forbidding mountain areas surrounded by swirling mists that caused deadly diseases and fatal epidemics. Frankincense and myrrh brought from such inhospitable terrain was considered to be sacred to the gods, and reserved for divine worship.

The frankincense and myrrh market of the Old World was highly lucrative for almost 1,500 years. The source was based in a small geographic area, the demand far exceeded the trees ability to produce, and

there were great difficulties in delivering the materials over vast distances. As a result, the flow of these resins as commodities made the Arabs who dealt in them among the wealthiest on earth at the time.

The trading of frankincense and myrrh expanded greatly around the 11th century BCE, with the establishing of improved land routes and domestication of the camel. From the harvesting centers in northeastern Africa and the Arabian Peninsula, the resin was transported to Egypt, and then by sea to India and other destinations. The life of the Arabian frankincense and myrrh merchant was one of camel caravans crossing barren sands, navigating by stars, and following a route between secret water cisterns hidden from roaming thieves. Many cities, such as the rock-carved canyon city of Petra, prospered and reached high levels of sophisticated civilization because of the wealth brought by these resins. By 1000 BCE, myrrh and frankincense were widely distributed throughout the Old World. Babylon, Assyria, Egypt, Persia, Rome, Greece, and China all imported these resins, to be used as temple incenses and as important medicines. Frankincense and myrrh were prized possessions in the ancient world, rivaling the value of many precious gems and metals.

The height of the frankincense trade occurred during the second century CE when some three thousand tons were shipped each year from south Arabia to Greece, Rome and the Mediterranean region. After the 3rd century CE the trade went into its decline, although demand still supported Arabia for another three hundred years. Even into the Middle Ages frankincense was an Arabian trading commodity.

Economic and Ecological Value

Frankincense and myrrh trees are crucial for preservation of fragile desert ecologies, and are a source of sustainable livelihood for local societies, especially those maintaining nomadic and semi-nomadic lifestyles. Many of the ecological, economic, and spiritual traditions surrounding these trees are in danger of being lost. Large areas of their native habitat have been cleared for cultivation, firewood, building materials, and animal fodder. Without the trees, wind and rain erode the underlying soil, producing infertile sub-desert conditions and forcing people to migrate to cities. However, if protected, these trees could provide valuable crops of oils, gums and resins, as well as preserve traditional agrarian lifestyles.

The early frankincense trade was of great economic significance to those who lived in the areas where the trees grew, to those who managed the trade in the various market outlets, and to those who controlled the overland trade routes. For the semi-nomadic people living off the land, harvesting of frankincense has historically proven to be a viable livelihood. The harvesting of the resins is a sustainable practice, whereas the current harvesting of the wood is not.

In Somalia, which is one of the poorest and least-developed countries in the world, trials to plant new stands of frankincense are currently underway. Current interest in frankincense essential oil in the West has helped develop a small but strong market for Somali frankincense. While destruction threatens some species of *Boswellia* in some regions, in others there is an abundance that is not being utilized. Ethiopia and Sudan are the biggest exporters of *Boswellia papyrifera*, with abundant supplies of this type of resin offering good potential for economic development in these countries.

I. Frankincense

Origin of the Name

The Arabs called the milky sap of the frankincense tree *al lubn*, from the word for milk. The same word gave rise to the name of Lebanon, whose mountains were always capped by milky snow. *Al lubn* became anglicized to *olibanum*, which is another name for frankincense. The word frankincense means the true, or frank, incense.

Origin and Habitat

Frankincense trees are found in Oman, Somalia, Ethiopia, Yemen, the southern Arabian Peninsula, and India. The desert of the Dhofar region in southern Oman is the source of *Boswellia sacra*, sacred frankincense. The *Boswellia serrata*, Indian frankincense, is widely distributed and abundant in the dry, hilly parts of India. The trees on the Somali coast grow out of polished marble rocks without soil; the purer the marble the stronger the tree. The *Boswellia papyrifera* grows primarily in Ethiopia and Sudan.

Botany and Morphology of Frankincense

Frankincense is the hardened oleo gum resin exudate (a mixture of volatile oil, gum, and resin) from different species of *Boswellia*. It is a translucent, brittle, whitish-yellow substance, in roundish, club-shaped, pear-shaped, or irregular tears, and usually covered by a whitish substance produced by the pieces rubbing against each other. The purer varieties are almost colorless, whitish, or with a greenish tinge, and easily flammable. It has a sub-acrid, terebinthinate, bitter, and aromatic taste. It melts with difficulty, becomes soft and adhesive by chewing, and forms an incomplete white emulsion when rubbed up with water.

When burned, frankincense produces a brilliant flame and diffuses an agreeable aroma. This aroma is described as fresh, balsamic, dry, resinous, slightly green, with a fruit topnote and a diffusive note of unripe apple peel. This fragrance is due predominantly to mixtures of complex mono- and sesquiterpenes.

There are approximately twenty-five species in the genus. The major species are *Boswellia sacra* (synonymous with *Boswellia carteri*), *Boswellia papyrifera*, *Boswellia serrata* (Indian frankincense), *Boswellia thurifera*, *Boswellia neglecta*, and *Boswellia frereana*.

There is much confusion surrounding the proper identification of the various types of frankincense found in the market. Contributing to this confusion are differences in species, varieties of individual species, effects of microclimates on the trees, variations in quality of harvested resin, and time of harvesting. To those who gather the resin in the wild, these differences are not economically important enough to differentiate between species. Wild-harvested frankincense therefore has unique individual characteristics.

In the Dhofar region the trees tend to be short and squat, reaching a height of five meters, with papery peeling bark which varies from white to reddish in color. Multiple trunks often rise out of a cushion or disk-like base which helps stabilize the tree on the boulders and steep embankments where they grow. Alternate, pinnately compound leaves cluster at the end of branches. Small white to pale pink flowers appear on the tree from September to November and are followed by small capsule, obovoid type fruits. All parts of the tree from the flowers, fruit, bark, and wood, are charged with the resinous perfume.

The Indian Frankincense (*Boswellia Serrata*) is a large, tall, deciduous tree having a straight, buttressed trunk with a clear bole and widespread branches. The trunk and branch bark are gray in color and have hard, sharp, and conical spines.

Frankincense trees can live for at least a hundred years. Their flowers are popular with bees.

Harvesting

In Oman, frankincense is gathered by Bedouins; trees are owned by the families living in a particular area where they grow. The guardianship of the trees is passed on from generation to generation, and there are ancient rituals surrounding the harvesting of the resin. On the southern Arabian coast, the trees are tapped yearly by visiting parties of Somalis, who pay the Arabs for the privilege of collecting

frankincense.

Frankincense from Oman is harvested during the spring and fall, with that produced from the fall harvest considered the best. In India, the collecting of *Boswellia serrata* resin, or Salai-guggul, is carried out towards the end of October.

The general process of harvesting frankincense is similar in the various regions. The trees are scored at various places along the main trunk and branches with a sharp metal blade, or by scraping away a portion of the bark. The wounds in the bark produce milky white resin, which hardens as it dries on the tree. Healthy and mature trees are selected for tapping, and proper tapping does not injure the tree. The oleo gum resin secreted from the cortex is fragrant, transparent, and golden yellow and solidifies into brownish-yellow tears or drops. In India, the oleo gum resin is scraped and collected in a circular tray placed around the trunk. In Oman, once the season's collection is completed, the raw frankincense is stored in dry caves to cure before being sold.

In general, there are four grades of frankincense tears. The first is the superfine, which is translucent, very light yellow and free from impurities. The second is first quality, which is brownish yellow and less translucent, but free from impurities and bark. The third is second quality, which is brownish, semi translucent, and containing some impurities. The lowest grade is third quality, which is dark brown, opaque, and with impurities. In India, the highest grade is what is collected first, while in Oman the later collections are considered superior.

When the oleo gum resin is collected exclusively for essential oil production the fresh semi-solid material is used. It is not allowed to dry, because drying would cause many trace components to be lost.

Essential Oil

The essential oil of frankincense contains more than two hundred molecular compounds, which give the essence a very complex bouquet and range of therapeutic applications. Even within a particular species of tree there can be considerable difference in the proportion of these components depending on the microclimate and soil where the trees grow, the season at which the resin is harvested, and a number of other variables. The oil is also influenced by age and storage. Frankincense oils are therefore diverse from an olfactory and therapeutic standpoint.

Traditional Uses of Resin

Large amounts of frankincense tears are consumed in the local harvesting areas. The fresh gum is chewed for strengthening the teeth and gums, to stimulate digestion, to expel congested phlegm, and to combat halitosis. Small pieces of gum are inserted into painful teeth and to combat dental caries. The resin is boiled in milk until a thick paste is formed, which is then applied as a poultice to inflamed swellings such as mastitis, and taken internally for bronchial conditions. It is infused in wine for respiratory conditions, and in Saudi Arabia the gum is added to coffee.

In the Dhofar region, women smooth the soft gum over their hair to keep it in place and give it a shiny appearance. Cones of the resin are burned as candles outdoors at night to keep away wild animals and evil spirits. The ancient Egyptians used frankincense and myrrh for embalming, as resins are bacteriostatic and do not decay. Frankincense is used in Arab homes to perfume clothes and purify the atmosphere. It is used in traditional festivities such as weddings and religious celebrations. Visitors are often offered bowls of burning frankincense; men use it to fumigate their beards, while women perfume their head shawls. Students facing exams place two or three of the highest quality tears in water with a piece of iron overnight and drink the resulting liquid first thing in the morning; this has been found to improve their memory and consequent chances of success.

Therapeutic Properties

The oleo gum resins produced by trees such as frankincense, myrrh, pine, spruce, fir, and others are a major part of the trees immune system. Tree sap has antibiotic and antifungal properties which protect the tree from infections, wound-healing properties for closing and regenerating the bark, and pheromone-like signaling mechanisms for repelling insect attackers and attracting the attacker's natural predators. When humans use oleo gum resins or essential oils derived from trees, we are utilizing the molecular components of the trees immune system to boost our own. The general functions of frankincense resin and essential oil can therefore be described as immune-enhancing; antibiotic, antifungal, antiviral, and antiseptic; and wound-healing, with pronounced anti-inflammatory properties. Below is a brief list of the most important therapeutic applications of frankincense, which is by no means complete; the uses of frankincense are so numerous that it can accurately be described as a panacea, used for everything from colds to cancers. Since the resin is widely used for chewing, it can be assumed that it is not toxic to humans; however, use of the essential oil must be guided by appropriate precautions.

Skin

Frankincense has cytophylactic properties, meaning that it encourages healthy growth and regeneration of skin cells. Because it has rejuvenating and wound-healing effects on the skin, it is useful for treating cuts and other wounds, eczema, boils, acne, scars, stretch marks, skin ulcers, and inflamed skin. Traditionally, the resin was prepared into various salves and ointments for these purposes, while now the essential oil is used more often.

Mouth

Frankincense is chewed to strengthen teeth and gums and to refresh the mouth. It has antibiotic properties which make it useful for infections of the teeth and gums.

Digestion

Chewing of resin has the secondary benefit of cleansing the digestive system by stimulating bile flow and enzyme secretion and reducing fermentation. A decoction of the resin with cinnamon and cardamom is a traditional formula to relieve stomachache.

Colds

Steam inhalation of the essential oil is an excellent treatment for colds and sinus congestion. Traditionally, the smoke of the smoldering gum was inhaled for treating head colds.

Wounds

Powder of the dried gum is a common ingredient in herbal plasters and pastes used to treat wounds, especially in Chinese medicine. A traditional recipe for an antiseptic wound powder is to mix the powdered resins of frankincense, myrrh, and dried aloe.

Insect Repellent

Burning frankincense in churches had hygienic functions as well as spiritual importance. People of the Middle Ages lived in extremely unsanitary conditions, so the fumigation of churches helped reduce the stench of the unwashed congregants and reduce contagion through atmospheric purification. Burning frankincense also repels mosquitoes and flies.

Memory

The use of frankincense by students for memory and the addition of the resin to coffee, as described above, are based on the resins memory-enhancing effects. The addition of the resin to coffee is used as a stimulant to treat amnesia.

Rheumatism

While all types of frankincense have anti-rheumatic properties, the Indian frankincense in particular has been utilized by Ayurvedic medicine for this purpose (see *Boswellia Serrata* and *Boswellic Acids* below). Use of the essential oil in massage is an excellent treatment for rheumatic and other pains of the muscular system.

Psychological Conditions

Fumigation with frankincense has been used in various cultures to treat a wide range of psychological and emotional disorders. In modern aromatherapy, it is used to promote calmness, deeper breathing, and a relaxed state of mind, and is therefore beneficial for depression, anxiety, and mental negativity.

Headaches

Fumigation using the resin is a traditional treatment for headaches. Vaporizing of the essential oil can be used for the same purpose.

Childbirth

In frankincense-gathering regions, gum is burned beside the mother during labor, and the newborn baby is fumigated. Regular fumigation of the baby continues for forty days following the birth. The mother treats herself during this time by squatting over a bowl of the burning gum. This practice assists in the healing of scarring or lacerations, protects the woman from postpartum infections, restores muscle tone, and accelerates recovery.

Decongestant

Frankincense essential oil and fumigation by resin help reduce excessive secretion of mucus.

Respiratory Antiseptic

Frankincense essential oil and resin are used for treating a variety of respiratory problems such as bronchitis and laryngitis. Steam inhalation of the essential oil, combined with other respiratory oils such as eucalyptus, is highly effective. Traditionally, the resin was boiled in goat milk and taken as an antitussive.

Eyes

The resin is a common ingredient in eye washes to treat infections and irritations, as well as a wide variety of ophthalmic diseases. Fumigation with the smoke is considered beneficial to sore or tired eyes.

Cosmetics

Frankincense has countless uses in both modern and traditional cosmetic products. Mixed with beeswax, the resin was once a common treatment for removing darkness and bags under the eyes. Egyptian women use frankincense in various preparations for rejuvenating face masks; it helps improve dry, wrinkled, and aging skin.

Medicinal Uses of *Boswellia Serrata*
Indian frankincense (*Boswellia serrata*) has been used extensively in Ayurvedic medicine. Its function is similar to the myrrh-like resin obtained from *Commiphora mukul*. The *Sushruta Samhita* and *Charak Samhita* describe the anti-rheumatic activity of various types of gugguls (oleo gum resins), especially

the *Boswellia serrata*; these texts indicate that these resins have been used medicinally for over a thousand years.

Boswellia Serrata resin is described as having bitter and sweet flavors, with astringent, demulcent, expectorant, antiseptic and anti-inflammatory properties. It is a powerful wound healer and very effective in the treatment of painful joint diseases with inflammation and reduced mobility. It improves blood supply to the affected areas, shrinks inflamed tissue, reduces pain, and enhances repair of local blood vessels damaged by proliferating inflammation. These effects are attributed to chemical compounds known as boswellic acids, which are now used in contemporary medicine as anti-arthritis and anti-inflammatory pharmacological agents.

Boswellic Acids

The gum resin of Indian frankincense (*Boswellia serrata*) contains four major pentacyclic triterpenic acids, collectively referred to as boswellic acids. Studies have shown that boswellic acids have an anti-inflammatory action much like conventional non-steroidal anti-inflammatory drugs (NSAIDs). *Boswellia* inhibits pro-inflammatory mediators in the body such as leukotrienes. As opposed to NSAIDs, long-term use of *Boswellia* does not lead to irritation or ulceration of the stomach.

A review of PubMed reports on clinical trials using boswellic acids or resin of *Boswellia serrata* reveals that these substances have been studied and found highly effective in such conditions as rheumatoid arthritis, osteoarthritis, low back pain, soft tissue rheumatism, myositis, fibrositis, chronic colitis, ulcerative colitis, Crohn's disease, bronchial asthma, and peritumoral brain edemas. Besides its pronounced anti-inflammatory properties, it has been found to have a strong immuno-stimulant activity.

Incensole

There has recently been increased interest in using frankincense essential oil as an anti-cancer agent. The following quote is from a personal correspondence with Dr. Ermias Dagne, Addis Ababa, Ethiopia, who is distilling various gum resins for Floracopeia.

Extracts of *Boswellia papyrifera* and *Boswellia Carteri* contain a diterpene compound called incensole. Incensole is an interesting biologically active compound, reported to have anti-cancer properties. Incensole and other similar diterpene compounds cannot be captured by steam distillation, as they are not highly volatile. About ninety-nine per cent of the resin is thrown out after distillation, but many interesting compounds are present in the residue and hydrosol. Extraction of this residue using food-grade ethanol from organic molasses brings out large proportions of diterpenes, which give the extract a very rich balsamic aroma, with incensole as one of the major components. On the other hand, incensole is only a minor component of the essential oil which is obtained by steam distillation.

Based on this information, we are currently developing a high-incensole ethanol extract of *Boswellia papyrifera*, which will be used in various formulations.