



## Frankincense and Myrrh: The Botany, Culture, and Therapeutic Uses of the World's Two Most Important Resins

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### Introduction

Frankincense and myrrh are without a doubt the world's 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.

# Frankincense

## Origin of the Name

The Arabs called the milky sap of the frankincense tree al lubán, from the word for milk. The same word gave rise to the name of Lebanon, whose mountains were always capped by milky snow. Al lubán 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 resin's 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-arthritic 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.

# Myrrh

## Origin of the Name

Myrrh is a resin that has a bitter taste; its name is derived from Hebrew murr or maror, meaning bitter.

## Origin and Habitat

Myrrh is an oleo gum resin obtained from species of *Commiphora* trees. There are over fifty species of *Commiphora* known in Africa, including *Commiphora molmol* (Somalian myrrh), and *Commiphora mada*, (Abyssian myrrh). These are small trees of the *Burseraceae* family, native to the bushland that covers the drier parts of north-eastern Africa, Somalia, Arabia, Madagascar, and India. Myrrh is now also found in Ethiopia, Iran, and Thailand.

The major commercial source of myrrh is *Commiphora myrrha*. However, like frankincense, there are uncertainties about the origin and identity of different types, many of which are not from *Commiphoras*. Some of the varieties of resin found in the market include Mecca balsam, said to be the myrrh of the Bible; different types of bdellium, including perfumed bdellium, formerly known as East Indian myrrh, African bdellium, opaque bdellium, and Hotai bdellium; and gugul, or Indian bdellium. To further complicate the subject, there are also several varieties of *opopanax* which are sometimes confused with myrrh, such as *Commiphora guidotti*, known as sweet myrrh, cassie (*Acacia farnesiana*), and copal (*Copaiba officinalis*), an oleoresin which the Catholic church uses in place of myrrh in Central and South America.

## Morphology

Myrrh is a thorny tree which grows in thickets to a height of about nine feet, preferring well-drained soil in the sun. The light gray trunk is thick and the main branches are knotted, with smaller branches protruding at a right angle and ending in sharp spines. It has hairless toothed leaves with a large terminal leaflet and two tiny lateral leaflets. Yellow-red flowers grow on stalks in an elongated and branching cluster; they are about five millimeters long and come out just before the rains. The small brown fruits are about one and a half centimeter long, tapering to a pronounced beak. The bark has a silvery sheen and peels in small pieces.

## Collection of Resin

Like frankincense, myrrh resin is collected as a thick, strongly aromatic yellow liquid from natural cracks or cuts in the tree bark, which then dries into amber or

reddish-brown colored lumps. The tears are found in many sizes, the average being that of a walnut. The surface is rough and powdered, and the pieces are brittle, semi-transparent, oily, and often show whitish marks. It is flammable, but less so than frankincense. Adulterations are not easily detected in the powder, so it is better to purchased in bulk so they can be removed.

The oil which is distilled from myrrh resin is typically thick, pale yellow to orange-brown, with a warm, balsamic, sweet, spicy, and sharp aroma. It has many of the same properties as the resin itself.

### **Historical and Traditional Uses**

Myrrh is one of the oldest medicines in the world. It has been mentioned in Egyptian medical texts since 2,800 BCE, and is one of many herbs mentioned in the Ebers Papyrus, which documents over eight hundred medicinal recipes. The Egyptians consumed large amounts of myrrh, both in temple rituals and embalming; it was also burned in temples of Babylon, Greece, India, Rome and China. It is one of the ingredients of the famous magic-inducing incense, Kyphi, and the ointment Metopian, used for treating infections and wounds. In Chinese medicine, the use of myrrh was recorded as early as 600 CE during the Tang Dynasty, where it was used in a similar manner. Like frankincense, myrrh was an important trade item for more than a thousand years.

Traditionally, myrrh was used for as many diverse purposes as frankincense. It was a primary ingredient in incenses and holy oils used to inspire prayer, deepen meditation, and revitalize the spirit. It was used to fumigate the body to promote cleanliness and stimulate immunity, and continues to have an important role in cosmetics and perfumery. It has also been used to treat cattle and camels, and burned to repel snakes.

### **Therapeutic Uses**

Like frankincense, myrrh resin is a predominant part of the tree's immune system. Many of the therapeutic functions of myrrh are therefore similar to frankincense. A comparison of the two reveals that myrrh is more astringent, antiseptic, disinfectant, bitter, and tonic, while frankincense is more anti-inflammatory, blood vitalizing, and mentally uplifting. The two are often combined. Like frankincense, myrrh has a long history of use for a wide range of conditions, with virtually no toxicity.

The Eclectic physician Dr. Ellingwood describes the therapeutic properties of myrrh as follows: "This agent has always been highly esteemed as a stimulant, although its influence is more of a local than a general character. It exercises the characteristic influence of most of the stimulants upon the excretions and secretions, acting as a di-

aphoretic, expectorant, sialagogue, and to a certain extent emmenagogue. As a most active general stimulant in ulcerative, engorged, flabby and atonic conditions of the mucous membranes of the mouth and throat this agent acts promptly. It stimulates the capillary circulation, restores tone and normal secretion and causes the healing of ulcerations. In its influence upon the digestive apparatus myrrh is direct in its action. It quickly increases the power of the digestive function, stimulating the peptic glands to extreme action. It increases the appetite and promotes the absorption and assimilation of nutrition. It is given in atonic dyspepsia in the absence of inflammatory action, especially if there is excessive mucous discharge from the bowels.”

Below is a brief list of the most important therapeutic applications of myrrh, which is by no means complete; like frankincense, its uses are so numerous that it can also be described as a panacea.

### **Mouth and Throat**

Myrrh is a specific and highly effective antiseptic astringent for inflammations of the mouth, throat, and gums. It is a common ingredient of herbal toothpowders and mouthwashes, and is widely used through India and the Middle East for oral and dental problems. The German Commission E has approved myrrh for treating mouth inflammation. Its list of indications includes mouth sores and ulcers, gingivitis, irritation from dentures, soreness and looseness of teeth and gums, gum disease, tooth decay, and bad breath. Myrrh is also very effective for infectious and inflammatory conditions of the throat, including strep throat, tonsillitis, and pharyngitis.

For these various symptoms, tincture of myrrh can be diluted and used as a mouthwash and gargle, or applied directly to sores. It is frequently combined with echinacea and/or golden seal for these purposes.

### **Digestion**

In the digestive tract myrrh acts as a stimulant, carminative, tonic, and chologogue. Its bitter principles stimulate the appetite and the flow of digestive juices, improving digestion and absorption. It both relaxes and invigorates the stomach, calming spasms, relieving gas, and combating fatigue associated with weak digestion. Its antibacterial and antifungal powers help reduce candida and other pathogenic factors in the gut. Myrrh has pronounced anti-parasitic properties. By improving digestion myrrh clears toxins from the digestive tract and acts as a general detoxifying and anti-inflammatory remedy, thereby treating the root causes of arthritis, rheumatism, and gout. It can be combined with aloe vera for treatment of both the symptoms and causes of constipation.

## **Respiratory System**

Myrrh is a stimulant, expectorant, and decongestant with antibacterial properties. It is helpful for relieving bronchitis, asthma, and colds. In Ayurvedic terms, it dries kapha (mucous secretions), reduces pitta (antibiotic), and stimulates prana (opens breathing). In Chinese terms, it is a stimulant of Wei Chi (respiratory immune enhancing). It can be a specific remedy for chronic sinusitis. It can be used in carrier oil as a chest rub.

## **Skin**

Myrrh is an astringent antiseptic that is beneficial for acne, rashes, and inflammatory skin problems. The tincture, powder, or essential oil of myrrh can be applied directly to ulcerated sores, wounds, and abrasions. It can be made into salves for treating hemorrhoids and bed sores. For boils it can be taken as a blood cleanser while also being applied externally. It is an excellent addition to the medicine cabinet of those who live in tropical places such as Hawaii, where staph infections can be easily acquired from coral cuts or walking on beaches.

## **Wounds and Bruising**

Myrrh is similar to frankincense in its wound-healing and blood-vitalizing properties, and the two are often combined in liniments.

## **Antimicrobial and Immune Stimulant**

Myrrh is both an antimicrobial agent and a direct stimulant of white blood cell production. It increases resistance to infection, and is one of the most effective of all known disinfectants from the plant kingdom. It is a rejuvenating tonic, and is reputed to enhance of the intellect.

## **Gynecology**

Myrrh acts as an anti-spasmodic circulatory stimulant to the uterus. In this capacity, the resin or tincture is taken for amenorrhea and dysmenorrhea as a purgative of stagnant blood. It helps normalize irregular periods. Myrrh helps promote efficient contractions and relieves pain during childbirth. As an antimicrobial, dilute tincture can be used in vaginal douches. Its internal use should be avoided by pregnant women.

## **Circulatory System**

Myrrh is classified in Chinese medicine as a blood vitalizer with anti-rheumatic and anti-arthritic powers. It is commonly used in liniments and medicated oils for these conditions, as well as general circulatory weakness and stagnation.

## **Warnings and Contraindications**

Myrrh should not be taken orally by women who are pregnant. Oral doses of two to four grams have resulted in kidney irritation and heart rate changes, both of which resolved after individuals stopped taking myrrh. Cases of allergic rashes have been reported from the topical use of myrrh. It may lower blood sugar in some individuals.

### **Myrrh Abstracts from PubMed**

A sampling of studies published on PubMed concerning myrrh derived from different species of *Commiphora* reveals that the resin reduces cholesterol and triglycerides; that it is a promising non-hepatotoxic anti-helminthic for schistosomiasis; that it is highly effective (100 per cent cure rate) on fascioliasis parasite without remarkable side effects; that its triterpene Myrrhanol A is a more potent anti-inflammatory than hydrocortisone; that it possesses smooth muscle-relaxing properties; that its sesquiterpene fractions had antibacterial and antifungal activity against pathogenic strains of *E. coli*, *Staphylococcus aureus*, *Pseudomonas aeruginosa* and *Candida albicans*; and that its extract has strong efficacy as an insecticide against the cotton leafworm. In other publications it has been reported that a sesquiterpenoid compound isolated from myrrh is highly effective against drug-resistant tumor cells found in the breast and prostate, without toxicity to healthy cells.

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