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Herbal Medicinal Plant Report

➢ **Contains:**

- Synonym
- Biological Source & Family
- Chemical Constituent
- Geographical Source
- Cultivation & Collection
- Microscopic characteristics
- Medicinal Uses

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Moh

Synonym:

Drumstick tree, Horseradish tree, Ben oil tree

Biological source:

Derived from *Moringa oleifera*

Family:

Moringaceae

Chemical constituent:

Alkaloids (moringinine)

Flavonoids,

Saponins,

Tannins,

vitamins (a, c, e),

Minerals (calcium, potassium, iron)

Essential amino acids

Geographical source:

Native to the Indian subcontinent but widely cultivated in Africa, South America, and Southeast Asia

Cultivation:

Prefers tropical and subtropical climates, grows well in dry or arid regions with well-drained soil

Harvesting:

Leaves can be harvested year-round, while pods are collected when mature

Collection:

Leaves, pods, seeds, and bark are collected manually

Microscopic characteristics:

Small to medium-sized tree, compound pinnate leaves, long drumstick-like pods, fragrant white flowers

Uses:

Medicinal:

Antioxidant, anti-inflammatory, anti-diabetic, antimicrobial, and hepatoprotective properties.

Nutritional:

High in vitamins and minerals, used as a superfood.

Cosmetic:

Used in skincare products for anti-aging and moisturizing effects.

Industrial:

Moringa seed oil (ben oil) is used in lubricants and perfumes

Evaluated By:

Principal

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Mango

Synonym:

Aam tree

Biological source

Mangifera indica

Family:

Anacardiaceae

Chemical constituent:

- **Vitamins**: High in Vitamin C, Vitamin A, and several B vitamins.
- **Minerals**: Potassium, magnesium, and calcium.
- **Phenolic compounds**: Mangiferin (a potent antioxidant), quercetin, and other flavonoids.

Geographical source:

- Major mango-producing countries include **India, China, Thailand, Indonesia, the Philippines**, and **Mexico**.

Cultivation - Mangoes thrive in **tropical and subtropical climates** with plenty of sunshine and warm temperature.

Harvesting:

- Mangoes are usually harvested **when they start to ripen** on the tree, but are still firm to the touch. This helps avoid bruising and spoilage.
- **Ripening** can continue off the tree, but care must be taken to handle them gently to prevent damage.

Collection:

After harvesting, mangoes are typically **sorted and cleaned**. Depending on their ripeness, they are either sold fresh or processed into various products like juices, dried mango, or jams.

Microscopic characteristics:

 Microscopically, mangoes have **starch granules**, which can be observed in the flesh under a microscope.
 The **skin** has **small epidermal cells**, and the **seed** consists of a hard seed coat and inner embryo, which can be studied at the cellular level.

Uses:

Medicinal:

Mango leaves are sometimes used in traditional medicine to treat diabetes, lower blood pressure, and manage various digestive issues.

Nutritional:

 Rich in antioxidants: Help protect against free radicals, aging, and inflammation.
 Digestive health: Mangoes are a good source of fiber and enzymes like **amylase**, which aid in digestion.
 Boosts immune system: The high Vitamin C content strengthens the immune system.

Cosmetic:

 Moisturization: Mango butter is an excellent moisturizer that helps keep skin soft and hydrated, making it a common ingredient in body lotions, lip balms, and creams.
 Anti-aging: The high levels of **Vitamin C** and **antioxidants** in mango butter promote collagen production, helping to reduce wrinkles and fine lines.

Industrial: Mangoes are also used in cosmetics (like skin creams and oils) and in the production of flavored beverages

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Kadam

Synonym:

Kadamba, Priyaka, Vrtta-pushpa, Nipa

Biological source

The biological source refers to the organism or natural entity from which the plant originates. In the case of Kadam, it is a tropical tree native to Southeast Asia and parts of India. It belongs to the family *Rubiaceae*, and its biological source could also refer to the parts of the plant that are used (such as leaves, bark, or flowers).

Family:

Rubiaceae

Chemical constituent:

alkaloids, flavonoids, and tannins

These compounds contribute to the plant's medicinal properties, such as its use in treating fever, inflammation, and infections. The bark and leaves of the Kadam tree are often used in herbal medicine due to their chemical composition.

Geographical source:

The Kadam tree is native to the tropical regions of Southeast Asia, including India, Myanmar, and other parts of the Indian subcontinent. It thrives in tropical climates, often in forested areas or near riverbanks, where it can be found at lower altitudes.

Cultivation

Kadam trees are grown in tropical and subtropical regions. They are cultivated for their timber, medicinal properties, and cultural significance. The cultivation process involves planting seeds or saplings in well-drained soil, preferably in regions with high rainfall and humidity.

Harvesting:

Harvesting refers to the process of collecting plant materials when they are mature and ready for use. For Kadam, harvesting typically involves collecting leaves, flowers, or bark for medicinal purposes. **Collection:**

Microscopic characteristics:

The microscopic characteristics of Kadam can be observed under a microscope and typically refer to the cellular structure of the plant. For instance, its leaves and bark contain vascular tissue, specialized cells for transporting water and nutrients. The presence of glands secreting bioactive compounds and the structure of the plant's epidermis can also be analyzed microscopically.

Uses:

Medicinal:

Kadam has anti-inflammatory, antipyretic (fever-reducing), antimicrobial, and anti-diabetic properties. The plant is used in treating fevers, coughs, and various infections. The bark, leaves, and flowers are often used to create decoctions, infusions, or powders.

Nutritional:

- Kadam wood is valued for its use in construction, furniture making, and carpentry due to its durability and ease of working.
- **Cultural and Spiritual Uses**: The Kadam tree holds significance in various cultures and is often used in rituals, offerings, and temple decorations. In some regions, it is considered sacred, and its flowers are used in religious ceremonies.

Industrial:

Kadam trees are planted for soil conservation, afforestation projects, and improving the local ecosystem. Their fast growth rate makes them ideal for reforestation efforts.

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Shami

Synonym:

Tungaa, Keshahantri, Shankuphalaa

Biological source:

The Shami plant is a **tree species** scientifically known as **Prosopis cineraria**. It is a member of the **Fabaceae family** (Leguminosae), commonly known as the **pea or legume family**.

Family:

- The Shami plant belongs to the **Fabaceae family**.
- Common names include **Indian Mesquite**, **Khejri** (in local languages), and **Shami** in Hindi and other Indian languages.

Chemical constituent:

- **Tannins**: Known for their antioxidant and anti-inflammatory properties.
- **Flavonoids**: Provide antioxidant benefits and have antimicrobial properties.
- **Saponins**: Known for their ability to lower cholesterol and improve heart health.
- **Alkaloids**: These compounds are used in various medicinal applications.

Geographical source:

- **Native Region**: The Shami plant is native to the **arid and semi-arid regions of India**, Pakistan, and parts of the **Middle East**.
- It thrives in **dry, desert-like environments** and is well-suited to **low rainfall** and high temperatures, which is why it's often found in regions with **drought-prone** climates like Rajasthan, Gujarat, and other parts of North India.
- The plant is also found in parts of **Africa**, including **Sudan**, and the **Middle East**.

Cultivation:

 he Shami plant is grown for its **medicinal properties**, **wood**, and as **fodder for animals**.
 It is **cultivated** in **arid** and **semi-arid areas**, where its deep-root system helps prevent soil erosion and restore fertility.
 This tree is **drought-tolerant** and can survive in poor soil, making it a valuable plant in desert reclamation projects.
 It is also commonly found as part of **agroforestry systems** and **rangeland management** in dry climates.

Harvesting:

 Leaves and Pods: Shami trees are harvested for their **leaves** and **pods**, which have medicinal properties.
 Bark: The bark is collected for its **healing properties** and used in traditional medicine.

Collection:

Leaves, pods, seeds, and bark are collected manually

Microscopic characteristics:

 he plant's **leaf cells** are characterized by a high concentration of **chloroplasts** for photosynthesis.
 Xylem and **phloem tissues** are well developed, which help in water and nutrient transportation.
 The **pollen grains** of the Shami plant are **tricolpate** (having three furrows).

Uses:

Medicinal:

 Anti-inflammatory: Used in traditional medicine for treating arthritis and other inflammatory conditions.
 Diabetes Management: The leaves and seeds are believed to help regulate blood sugar levels and manage diabetes.

Nutritional:

High in vitamins and minerals, used as a superfood

Industrial: Use in industry for various purpose

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Jackfruit

Synonym:

Jobberwokey jackel

Biological source

The biological source of jackfruit is the *Artocarpus heterophyllus*, a large tropical tree belonging to the Moraceae family. This plant is grown for its edible fruit, and various parts of the tree (fruit, seeds, wood, etc.) have different uses in food, medicine, and industry.

Family:

ckfruit belongs to the *Moraceae* family,

Chemical constituent:

- **Carbohydrates**: Mainly in the form of sugars like fructose and glucose.
- **Proteins**: Jackfruit is rich in protein compared to many other fruits.
- **Vitamins**: It contains Vitamin C, Vitamin A, and some B vitamins (like folate).
- **Minerals**: Potassium, calcium, magnesium, and iron.

Geographical source:

In the case of Jackfruit: Jackfruit is native to Southwest India, but it is also widely cultivated in tropical and subtropical regions of the world. It is found in Southeast Asia, parts of Africa, Central America, and tropical islands in the Pacific.

Cultivation.

In the case of Jackfruit: Jackfruit is native to Southwest India, but it is also widely cultivated in tropical and subtropical regions of the world. It is found in Southeast Asia, parts of Africa, Central America, and tropical islands in the Pacific.

Harvesting:

Harvesting jackfruit is done manually, usually by climbing the tree with a special knife or pole. Jackfruits are harvested when they are mature but not overly ripe (they ripen further after being harvested). Depending on the region, the harvesting season can vary, but jackfruit trees typically produce fruit once a year.

Collection:

The collection of jackfruit refers to gathering the fruit from the tree once it's ripe or close to being ripe. It may also refer to the collection of other parts of the plant, such as leaves, wood, or seeds, which can be used for different purposes.

Microscopic characteristics:

- **Microscopically**
- **Cellular structure**: The fruit pulp is made up of large cells filled with a viscous, sticky substance.
- **Tissues**: The fruit's tissues are composed of fibrous cells, and the seed is encased in a thick, hard outer covering.

Medicinal:

- **Traditional Medicine**: Jackfruit has been used in traditional medicine for centuries in various cultures. The seeds are said to have anti-inflammatory properties, while the fruit itself is believed to help regulate blood sugar and digestion.
- **Health Benefits**: Jackfruit is rich in antioxidants and fiber, which may aid in digestion, boost the immune system, and improve skin health. It is also known for its potential to lower blood pressure and improve heart health due to its high potassium content.

Nutritional:

- **Fiber**: The fibers from the jackfruit tree (particularly from the bark and leaves) are used to make durable textiles, ropes, and paper products.
- **Wood**: Jackfruit wood is heavy, strong, and durable, making it useful in furniture making, construction, and carving.

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Raal

Synonym:

RALL Origin, Source organism, Source species

Biological source:

The biological source of a plant refers to its origin in nature—whether it's derived from a specific plant species, part of the plant, or a microorganism. For instance, the biological source of a medicinal plant may be the species *Echinacea purpur*

Family:

Plant family, Taxonomic family

Chemical constituent:

Chemical constituents refer to the individual chemical substances that make up a plant. These may include alkaloids, flavonoids, terpenes, or essential oils. For example, *Mentha piperita* (peppermint) contains menthol as its primary chemical constituent, which provides its characteristic aroma and medicinal properties.

Geographical source:

The geographical source refers to the location from which a plant or its parts originate. Plants may be native to particular regions or may be cultivated in specific climates for optimal growth. For instance, *Cinchona officinalis*, the source of quinine, is originally from South America but has been cultivated in other parts of the world.

Cultivation:

Cultivation involves preparing soil, planting seeds, nurturing plants, and managing their growth. It includes activities like irrigation, fertilization, and pest control. For example, lavender is cultivated in temperate climates for its essential oils, used in aromatherapy.

Harvesting:

Harvesting is the act of collecting plant materials such as leaves, flowers, roots, seeds, or fruits once they reach maturity. This can be done manually or with machinery, depending on the scale of cultivation. For instance, the harvesting of *Camellia sinensis* (tea plant) involves plucking young leaves for processing into different types of tea.

Collection:

Collection refers to the process of gathering plants or their parts, often for research, medicinal use, or commercial purposes. For example, medicinal herbs might be collected from wild plants or cultivated fields for use in herbal medicine.

Microscopic characteristics: Microscopic characteristics refer to the fine details of a plant's structure that can only be seen with a microscope, such as cell structure, stomata, trichomes (hairs), or vascular tissue arrangement. These characteristics are essential for taxonomic identification or understanding a plant’s biological function..

USES

The uses of a plant can range from medicinal, culinary, and cosmetic to industrial and environmental. For example, *Aloe vera* is widely used for its soothing properties in skin care products, while *Cannabis sativa* has uses in both medicinal (pain management) and industrial (fiber production) contexts.

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kadulimb

Synonym:

Neem , kadunim, kadlimb

Biological source:

The species from which the plant is derived. For Neem, it is *Azadirachta indica*, a species of evergreen tree native to India and other parts of Southeast Asia..

Family:

A taxonomic rank that groups similar plants. Neem belongs to the *Meliaceae* family, which includes other trees like the *Chinaberry* and *Mango* trees.

Chemical constituent:

The active compounds in Neem that give it medicinal properties. These include **Azadirachtin** (an insect repellent), **Nimbin**, **Nimbolide**, and various flavonoids, saponins, and terpenoids.

Geographical source:

The geographical area or region where the plant is found or cultivated. Neem is native to the Indian subcontinent but is widely cultivated across tropical and subtropical regions of the world.

Cultivation:

The process of growing the plant under controlled conditions. Neem trees thrive in tropical climates and are commonly grown in India, Africa, and other parts of Asia.

Harvesting:

The process of collecting the mature plant parts (leaves, bark, seeds, etc.) for use. Neem leaves, seeds, and bark are harvested, with the leaves being collected during the dry season.

Collection:

Refers to the act of gathering the plant or its parts, which can be done from both cultivated plants and wild-growing trees. Neem leaves and seeds are often collected for medicinal and commercial purposes.

Microscopic characteristics

The small structural features of the plant observed under a microscope, such as the cell structures, glandular hairs on leaves that contain essential oils, and the arrangement of vascular tissue. These characteristics can help in plant identification and studying its medicinal properties.

USES

he various ways in which Neem is used. Neem has many uses, including its application in traditional medicine for skin diseases, its use in pest control, and its role in personal hygiene products like toothpaste and soaps. Neem oil is also used for its antibacterial and anti-inflammatory properties.

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Rui

Synonym:

Calotropis gigantea

Biological source:

The biological source of the plant, *Calotropis gigantea* is the species from which the plant is derived. It belongs to the *Apocynaceae* family.

Family:

The family to which the plant belongs. *Calotropis gigantea* belongs to the *Apocynaceae* family, which includes other plants like *Catharanthus* and *Nerium*.

Chemical constituent:

The active compounds found in *Calotropis gigantea* include **Calotropin**, **Giganteol**, and **Calotoxin**, which have medicinal properties. These chemicals are often responsible for the plant's toxicity and medicinal use in controlled doses.

Geographical source:

Calotropis gigantea is native to tropical and subtropical regions of Asia, Africa, and the Indian subcontinent. It is commonly found in India, Thailand, and other Southeast Asian countries.

Cultivation:

Collection involves gathering the plant materials (such as latex, leaves, or flowers) for medicinal or other uses, often done in the wild or cultivated areas.

Harvesting:

Harvesting refers to the process of collecting plant parts, such as leaves, flowers, or stems, for medicinal or industrial use. The latex from the plant is also collected.

Collection:

Collection involves gathering the plant materials (such as latex, leaves, or flowers) for medicinal or other uses, often done in the wild or cultivated areas.

Microscopic characteristics

Features observed under a microscope, such as the structure of glandular cells that produce latex, the arrangement of vascular tissues, and cellular structures. This helps in identifying the plant and understanding its biological properties.

USES

he plant is used in traditional medicine to treat conditions such as inflammation, wounds, and pain. *Calotropis gigantea* has anti-inflammatory, analgesic, and antimicrobial properties. However, it is toxic and must be used with care.

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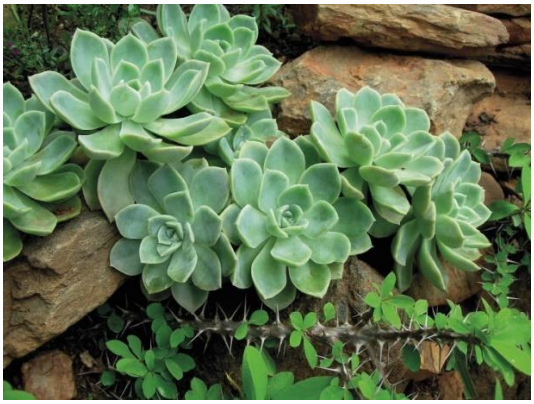
Vet



Synonym:

Vet Vetiver (*Chrysopogon zizanioides*):

Biological source:

Chrysopogon zizanioides is the species from which the plant is derived. Vetiver is a perennial grass native to India and other parts of South Asia.

Family:

The plant belongs to the *Poaceae* family, which is the grass family. Other common plants in this family include rice, wheat, and corn.

Chemical constituent:

Vetiver's aromatic oil, known as **vetiver oil**, contains compounds like **vetiverol**, **vetivenone**, and **khusimol**, which give it its distinctive scent. These chemicals are used in perfumes, skin care products, and traditional medicine.

Geographical source:

Vetiver's aromatic oil, known as **vetiver oil**, contains compounds like **vetiverol**, **vetivenone**, and **khusimol**, which give it its distinctive scent. These chemicals are used in perfumes, skin care products, and traditional medicine.

Cultivation:

Vetiver is cultivated mainly in tropical regions for its roots. It thrives in well-drained, moist soil and is often grown for its oil, which is extracted from the roots.

Harvesting:

Harvesting involves collecting the roots of the vetiver plant once it reaches maturity (usually after 18-24 months of growth). The roots are then cleaned and processed for oil extraction.

Collection:

The process of gathering the roots, which are the primary part of the plant used for oil extraction and other purposes

Microscopic characteristics

Vetiver roots contain distinct vascular tissues and are characterized by their fibrous structure, which can be observed under a microscope. This helps in understanding the plant's root system and its oil content.

USES

The primary use of vetiver is for its essential oil, which is used in perfumes, aromatherapy, and skin care. It also has medicinal uses for treating anxiety, stress, and inflammation. The plant is used in soil conservation efforts as it helps prevent soil erosion.

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Katesavar

Synonym:

Malabar silk-cotton tree, Red cotton tree, Silk-cotton

Biological source:

Bombax ceiba, like other trees of the genus Bombax, is commonly known as cotton tree. More specifically, it is sometimes known as Malabar silk-cotton tree; red silk-cotton; red cotton tree; or ambiguously as silk-cotton or kapok, both of which may also refer to Ceiba pentandra.

Family:

Bombacaceae

Chemical constituent:

Active ingredient, Chemical componentThe active compounds found in Ricinus communis include Ricin, a toxic protein, and Ricinoleic acid, the primary fatty acid, known for its medicinal and industrial applications

Geographical source:

geographical origin, Geographical location Ricinus communis is native to tropical and subtropical regions of Africa and Asia but is now widely cultivated in many parts of the world for its oil.

Cultivation:
The **Red Silk Cotton Tree** (*Bombax ceiba*) thrives in tropical and subtropical climates, preferring well-drained, fertile soils with a slightly acidic to neutral pH. It is propagated from seeds and requires regular watering during early growth. The tree grows rapidly, reaching up to 30-40 meters, and produces large red flowers in the dry season. It requires organic fertilizers and occasional pruning for better flowering. The tree is cultivated for its ornamental value, fiber, bark, and seeds, which

Harvesting:
Collection, Gathering, Reaping Harvesting refers to the collection of (seeds) from the plant once they have ripened.

Collection:
Gathering, Harvesting, Accumulation Collection involves gathering plant materials such as castor seeds or leaves for use in medicinal, cosmetic, or industrial applications.

Microscopic characteristics:
Microscopic features, Microscopic traits, Microstructural characteristics Features observed under a microscope, such as the structure of the castor seed and the arrangement of vascular tissues, which are important for identification and understanding the plant's properties.

Uses:
Applications, Benefits, Medicinal uses, Purposes The plant is used primarily for extracting castor oil, which has numerous applications in medicine (laxatives, skin care), industry (lubricants, biodiesel), and cosmetics. The seeds, however, contain ricin, a highly toxic protein.

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Parijatak


Synonym:

Jasminum sambac *or* Indian Jasmine

Biological source:

The *Parijatak* plant is a species of *Jasminum* in the olive family (*Oleaceae*). Its biological source is primarily the plant itself, which is a shrub or small tree.

Family:

Oleaceae (Olive family). This family includes several aromatic plants, including jasmine.

Chemical constituent:

Parijatak contains essential oils, alkaloids, flavonoids, saponins, and glycosides. The flowers contain compounds like indole, jasmon, and benzyl acetate, which contribute to the plant's characteristic fragrance.

Geographical source:

Jasminum sambac is native to Southeast Asia, particularly in regions like India, China, and the Philippines. It grows in tropical and subtropical climates.

Cultivation:

Parijatak is cultivated primarily for ornamental purposes and for its aromatic flowers. It grows well in well-drained soil with adequate sunlight. It is commonly cultivated in home gardens and farms in tropical and subtropical regions.

Harvesting:

The flowers are typically harvested early in the morning or late in the evening when their fragrance is strongest. Harvesting is done by hand, as the flowers are delicate and can easily be damaged.

Collection:

The flowers are the primary part of the plant collected, as they are used in perfumes, traditional medicine, and for religious and cultural purposes. The leaves and stems may also be used in certain traditional applications.

Microscopic characteristics:

Under the microscope, the flowers of *Parijatak* show glandular cells that secrete essential oils. The leaves have stomata, which are important for gas exchange. The plant's trichomes (hair-like structures) help in the secretion of essential oils.

Uses:

Medicinal Uses: *Parijatak* is used in traditional medicine for treating various conditions like headaches, fever, and inflammation. The flowers are known for their calming and relaxing effects.
Aromatic Uses: The plant's flowers are used to produce perfumes, essential oils, and are also used in making jasmine tea.
Cultural Significance: In many cultures, especially in India, *Parijatak* flowers are used in religious rituals, garlands, and festivals like weddings.
Cosmetic Uses: Jasmine oil is widely used in cosmetic products for its fragrance and skin benefits.

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Arjuna

Synonym:

Terminalia arjuna

Biological source:

Arjuna is a deciduous tree belonging to the *Combretaceae* family. Its bark is the main part used for medicinal purposes.

Family:

Combretaceae (a family of tropical trees and shrubs, known for species with medicinal properties).

Chemical constituent:

Tannins (which contribute to its astringent properties)**,Flavonoids** (antioxidants that help reduce inflammation)**,Saponins** (which have a variety of medicinal benefits)**,Glycosides** (important for cardiovascular health)**,Arjunolic acid** (helps in maintaining heart health)**,Polyphenols** (providing antioxidant properties)

Geographical source:

Terminalia arjuna is native to the Indian subcontinent. It is commonly found along riverbanks, especially in India, Bangladesh, and Sri Lanka. It thrives in dry and semi-arid regions but can also be found in tropical forests.

Cultivation:

Arjuna is cultivated for its medicinal bark, which is used in various herbal preparations. It is grown in tropical and subtropical regions, particularly in India, where it is commonly planted along riverbanks and in forested areas. The tree grows well in well-drained, sandy soils and requires full sunlight.

Harvesting:

The bark of the *Arjuna* tree is harvested, which is usually done by making vertical incisions on the trunk. The bark is collected during the dry season, as it is when the plant's medicinal properties are most potent.
Harvesting the bark does not harm the tree, as the bark can regenerate over time.

Collection:

The main part of the *Arjuna* plant collected is its bark. The bark is used in various forms such as powdered form, decoctions, or as an extract in medicine.

Microscopic characteristics:

The *Arjuna* bark has distinct structures when viewed under a microscope. It contains numerous vascular bundles that are responsible for the transport of water and nutrients. The bark is rich in tannins, which give it its characteristic astringent properties.

Uses:

Cardiovascular health: It is particularly beneficial for heart diseases, including heart failure, hypertension, and high cholesterol.

Blood circulation: It is known to strengthen the heart and improve blood circulation.

Anti-inflammatory and antioxidant: Used to treat inflammation, respiratory conditions, and skin diseases.

Antioxidant: It helps in reducing oxidative stress and protects against various chronic diseases.

Evaluated By:

Principal

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Bel

Synonym:

Bael or *Bengal Quince*

Biological source:

The *Bel* plant is a deciduous tree with large, aromatic leaves and a distinct fruit. It is commonly found in tropical and subtropical regions. The fruit, leaves, and bark are primarily used for medicinal purposes.

Family:

Rutaceae (the rue family), which includes many aromatic and medicinal plants.

Chemical constituent:

- Alkaloids (important for antimicrobial and anti-inflammatory effects).
- Flavonoids (antioxidants that help reduce oxidative stress).
- Coumarins (used for their anti-inflammatory and antimicrobial properties).
- Tannins (provide astringent properties and support digestive health).

Geographical source:

The *Bel* tree is native to India, Nepal, Bangladesh, and parts of Southeast Asia. It thrives in dry, tropical regions and can be found in forests, temples, and home gardens.

Cultivation:

 Bel is cultivated for its fruit, medicinal uses, and religious significance. It grows well in dry, well-drained soil and requires a hot climate to thrive.
 The tree can be grown from seeds or by planting cuttings, and it typically requires full sunlight and a relatively dry environment to flourish., where it is commonly planted along riverbanks and in forested areas. The tree grows well in well-drained, sandy soils and requires full sunlight.

Harvesting:

 The fruit of the *Bel* tree is harvested when it ripens, typically in the summer months. The leaves are also harvested, especially for medicinal preparations and religious offerings.
 Harvesting is done by hand, and the fruit is collected once it turns yellow or orange and starts to split open.

Collection:

The primary parts of the *Bel* plant that are collected are the fruit, leaves, and bark. The fruit is typically used for making beverages, jams, or medicinal preparations. The leaves and bark are used in herbal treatments.

Microscopic characteristics:

 The leaves of *Aegle marmelos* contain glandular cells that secrete essential oils and other bioactive compounds. Under the microscope, the leaf structure is distinct with stomata for gas exchange and trichomes (hair-like structures) for secretion.
 The fruit's pulp is fibrous and contains numerous seeds. The seed coat is thick and protects the seeds within, which have a hard outer covering.

Uses:

The *Bel* plant is used for digestive health, treating inflammation, respiratory conditions, managing blood sugar, detoxifying the body, and in religious rituals.

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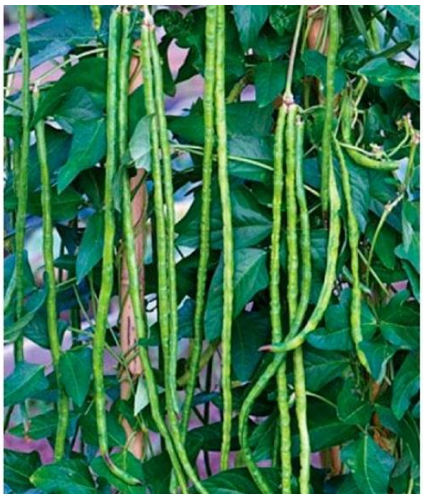
Paayar



Synonym:

Vigna unguiculata**, or** cowpea

Biological source:

 Payar **plant** is the biological source of **Vigna unguiculata**.

Family:

 The **Payar plant** belongs to the **Leguminosae** (Fabaceae) family.
 It is part of the subfamily **Faboideae**, which includes many other important legume species.

Chemical constituent:

 Proteins: The beans are rich in protein, making them a valuable food source.
 Carbohydrates: They also contain carbohydrates, including starch and sugars.
 Vitamins: The plant contains several vitamins such as **vitamin B**, **vitamin C**, **flavonoids**, **saponins**, and **antioxidants**

Geographical source:

The **Payar plant** is native to **West Africa** but has spread globally and is now widely cultivated in tropical and subtropical regions, including **Asia**, **Latin America**, and **Africa**.

Cultivation:

 Soil: It thrives in well-drained, fertile soils with a neutral to slightly acidic pH.
 Climate: The Payar plant grows best in warm climates with temperatures ranging from **20°C to 35°C**.
 Planting: It is usually grown from seeds, with planting depth typically being 2-3 cm.

Harvesting:

The plant is typically harvested when the pods have matured, and the seeds inside are fully developed. Harvesting time usually occurs about **60-90 days** after planting, depending on environmental conditions.

Collection:
 Collection refers to gathering the mature seeds from the dried pods for consumption or further use.
 After collecting the seeds, they are often cleaned and processed for culinary purposes or dried for storage.

Microscopic characteristics:

 Seed **Structure**: Under the microscope, the **Payar plant's seeds** reveal a **smooth** seed coat with an oval or kidney-shaped structure.
 Pod **Structure**: The pod is composed of several layers with distinct cellular arrangements.
 Trichomes **and Stomata**: The leaves and stems have microscopic structures like **trichomes**

Uses:

 Edible **Beans**: The seeds are commonly used in various cuisines, often as a source of **protein** in vegetarian and vegan diets. They can be boiled, fried, or made into stews, soups, and salads.
 Medicinal **Uses**: Traditional medicine utilizes different parts of the plant (leaves, seeds, roots) for treating ailments such as **diabetes**, **hypertension**, and **digestive issues**..

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Vad

Synonym:

Banyan tree

Biological source:

Ficus benghalensis is the botanical name, and it belongs to the **Moraceae** family, which includes other fig species.

Family:

The **Banyan tree** is part of the **Moraceae** family, the same family as other figs like the **common fig** (Ficus carica).

Chemical constituent:

Ficus benghalensis contains several bioactive compounds, such as **flavonoids**, **alkaloids**, and **tannins**. These compounds have various medicinal properties.

Geographical source:

Ficus benghalensis is native to **India**, **Bangladesh**, and parts of **Southeast Asia**. It is widely distributed in tropical and subtropical climates.

Cultivation:

 Climate: The tree grows well in **tropical** and **subtropical** climates.
 Soil: It thrives in **well-drained soils**, often found near water sources like rivers and lakes. **Growth**: The tree is known for its **aerial roots** that grow downwards from the branches to the ground, forming new trunks and expanding the tree's canopy.

Harvesting:

The **Banyan tree** is not typically harvested for wood, but its **leaves**, **latex**, and **roots** are used in traditional medicine. The **aerial roots** are often collected for use in weaving and handicrafts

Collection:
 The **latex** of the Banyan tree, along with its leaves and bark, are sometimes collected for **medicinal purposes**.
 Its **fruits** (small figs) are eaten by some animals and people in certain regions, though they are not typically harvested on a large scale for human consumption.

Microscopic characteristics:

 Leaf **structure**: The leaf surface of Ficus benghalensis shows a **waxy cuticle**, and under a microscope, the **stomata** can be seen on the underside of the leaf.
 Xylem **and Phloem**: The vascular tissue of the plant includes **lignified xylem** for water transport and **phloem** for nutrient transport.

Uses:

 Medicinal **Uses**: The **leaves**, **bark**, and **roots** have been used in traditional medicine to treat a variety of ailments such as **diabetes**, **diarrhea**, and **inflammation**.
 Cultural **and Religious Significance**: In Hinduism, the Banyan tree is considered sacred. The tree is often planted near temples, and worshiping under it is a common practice.
 Shade **Tree**: Due to its expansive canopy, it is often planted as a **shade tree** in parks and along roads.

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Ashoka

Synonym:

Ashoka plant (Saraca asoca)

Biological source:

The **Ashoka plant** is a tropical evergreen tree that belongs to the **Fabaceae** family. The tree is known for its ornamental beauty and is often considered sacred in Hindu mythology.

Family:

Saraca asoca belongs to the **Fabaceae** family, also known as the **legume** or **pea family**. Within this family, the tree is a member of the subfamily **Detarioideae**.

Chemical constituent:

 Flavonoids: These include compounds like **quercetin** and **kaempferol**, which have antioxidant properties. Tannins: Found in the bark, they have astringent and antimicrobial effects. Saponins: Present in the leaves and flowers, which have anti-inflammatory and antimicrobial properties.

Geographical source:

The **Ashoka plant** is native to **India**, **Sri Lanka**, and parts of **Southeast Asia**. It is commonly found in tropical forests and is often cultivated in gardens due to its striking appearance and religious significance

Cultivation:

 Soil: The tree prefers well-drained, loamy soil. It grows best in slightly acidic soil with a pH range of 6.5 to 7.5.
 Climate: It thrives in **tropical** and **subtropical** climates. It needs warm temperatures and can tolerate some drought but not extreme cold.

 Growth: The Ashoka tree is a slow-growing tree, typically reaching a height of 15 to 20 meters

Harvesting:

 The **flowers** of the Ashoka tree are typically harvested during the blooming season (usually in spring). These flowers are known for their bright, fragrant blooms.
 The **bark** and **leaves** are also collected for medicinal uses, especially from older trees.

Collection:
 Flowers: The bright yellow-orange flowers are collected for their aromatic and medicinal properties, often used in preparations for skin care or to treat digestive issues.
 Bark: The **bark** is commonly collected for medicinal purposes, particularly for treating gynecological issues such as **menstrual disorders** and **uterine problems**.

Microscopic characteristics:

 Leaf **Structure**: The leaves of the Ashoka plant have a **smooth surface** and are composed of **parallel veins**. Under a microscope, they reveal dense cells rich in chloroplasts that facilitate photosynthesis.
 Flowers: The flowers are small but grouped together in dense clusters. Each flower has a delicate structure, visible in cross-section, with a prominent pistil and stamens.

Uses:

The **Ashoka plant** is highly regarded in **Ayurveda** for its ability to treat **gynecological issues**. The bark is traditionally used to regulate menstrual cycles, ease menstrual cramps, and treat uterine disorders.

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Jai

Synonym:

Jasmine (Jasminum)

Biological source:

It is obtain from plant flower Jasmine flowers Jasmine plant Jasminum species

Family:

Oleaceae family (Olive family)

Chemical constituent:

 Alkaloids Flavonoids Essential oils (mainly jasmine oil) Indole compounds

Geographical source:

 Native to tropical and subtropical regions of Eurasia, particularly Southeast Asia, the Mediterranean, and parts of Africa. Commonly cultivated in regions with warm climates, like India, China, and Egypt

Cultivation:

 Grown in well-drained soil with plenty of sunlight
 Can be grown as shrubs or vines
 Prefers warmer climates

Harvesting:

 Jasmine flowers are typically harvested early in the morning when their fragrance is most potent

 Flower petals are carefully collected, especially for use in perfumes or oils

Collection:

 Jasmine flowers are collected by hand, especially for producing essential oils

 Often done in traditional methods to preserve the integrity of the flowers

Microscopic characteristics:

Jasmine flowers have a star-shaped, five-petaled structure. Cells contain essential oils in glandular structures, contributing to the fragrance. Microscopic features include trichomes (hair-like structures) on the leaves and stems

Uses:

 Aromatherapy: Jasmine oil is widely used in aromatherapy for its calming and mood-lifting effects.

 Perfume **industry**: Jasmine is one of the most popular flowers used in the production of perfumes.

 Traditional **medicine**: In some cultures, jasmine is used in teas and as a remedy for anxiety, depression, and insomnia.

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Palash

Synonym:

Butea monosperma

Biological source:

It is obtain from plant Palash tree Flame of the forest Butea monospermic

Family:

Fabaceae (Legume family)

Chemical constituent:

 Tannins Alkaloids Flavonoids (especially butin and isobutin) Glycosides
 Saponins Polysaccharides

Geographical source:

 Native to the Indian subcontinent, Southeast Asia, and parts of Africa

 Found in tropical and subtropical regions, commonly in India, Sri Lanka, and Nepal

Cultivation:

- Grows best in well-drained, sandy, or loamy soil
- Thrives in hot climates and is drought-tolerant once established
- Can be grown for ornamental purposes due to its striking flowers
- Also cultivated for medicinal and cultural uses

Harvesting:

- Flowers are harvested during the blooming season, usually in the spring
- The flowers, seeds, and leaves are used for various purposes, such as medicinal or for dye production

Collection:

- The flowers are often collected by hand, especially for medicinal purposes
- The seeds can also be collected for use in herbal preparations

Microscopic characteristics:

- Palash flowers have a characteristic shape with bright orange-red petals
- The plant's vascular tissues, particularly in the leaves and bark, contain tannins and alkaloids

Uses:

- Used in traditional medicine for treating various ailments like diarrhea, dysentery, and skin infections. The bark, leaves, and flowers are often utilized.
- It has anti-inflammatory, anti-diabetic, and antioxidant properties.
- The seeds are also used in treating ailments such as hemorrhoids, dyspepsia, and jaundice.

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Palash

Synonym:

Undal, **Tamanu** or **Ball Tree**

Biological source:

It is obtain from plant **Tamanu tree** **Indian Walnut** **Pili tree** **Ball Tree**

Family:

Calophyllaceae (the same family as other species like **Calophyllum**)

Chemical constituent:

 Tamanu oil (from the seeds) **Calophyllolide** (a lignan) **Triterpenes** **Fatty acids** (linoleic acid, oleic acid) **Xanthones** **Anthraquinones**

Geographical source:

 Native to Southeast Asia, the Pacific Islands, and parts of tropical Africa.
 Commonly found in coastal areas, especially along beaches or mangroves.

Cultivation:

 Tamanu trees thrive in tropical coastal areas with high humidity and well-drained, sandy soils.
 They are often grown for the extraction of **Tamanu oil** from the seeds, used in traditional medicine and cosmetics.

Harvesting:

- **Seeds** of Calophyllum inophyllum are harvested once they ripen, typically after the fruit falls to the ground.
- The seeds are then processed to extract **Tamanu oil**, which is highly valued for its cosmetic and medicinal properties.

Collection:

- Seeds are collected by hand or gathered after falling from the tree.
- **Tamanu oil** is extracted from the seeds, often using cold-pressing methods to preserve the oil's beneficial properties.

Microscopic characteristics:

- The **microscopic structure** of the leaves and bark contains cells that produce essential oils and resinous compounds, particularly in the glands.
- **Xylem and phloem** tissues play a crucial role in the plant's vascular system.
- The **seeds** contain oil-filled cells that, when crushed, release **Tamanu oil**.

Uses:

- **Tamanu oil** is widely used in traditional medicine to treat a variety of skin conditions, including **wounds**, **burns**, **eczema**, **acne**, and **scars**. It is believed to have **anti-inflammatory**, **antibacterial**, and **antifungal** properties.
- The oil is also used to relieve **muscle pain** and **arthritis**.

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Pimpal

Synonym:

 Ficus religiosa Sacred fig Peepal tree

Biological source:
The Peepal plant (Ficus religiosa) is a deciduous tree belonging to the genus *Ficus*. It is native to the Indian subcontinent and is often found in tropical and subtropical regions.

Family:

 Family: Moraceae The Moraceae family includes trees, shrubs, and vines, with several species valued for their edible fruits and medicinal properties.

Chemical constituent:
 Flavonoids (such as quercetin) **Tannins** **Phenolic acids** **Saponins** **Alkaloids** **Steroids**

Geographical source:
 The Peepal tree is native to the Indian subcontinent, particularly found in India, Nepal, Bangladesh, Pakistan, and Sri Lanka.
 It grows in tropical and subtropical climates and is commonly seen in religious or sacred groves.

Cultivation:
 Climate: The Peepal tree thrives in tropical and subtropical climates. It prefers warm, humid environments with a well-drained soil base. **Soil**: Well-drained, fertile soil with a slightly acidic to neutral pH is ideal. **Propagation**: It is propagated primarily by seeds, though root cuttings may also be used for

Harvesting:
 Leaves: Peepal leaves are collected throughout the year, but the best time is during the summer and monsoon seasons when the plant is in full growth. **Bark and Roots**: These are usually harvested for medicinal purposes and should be carefully collected without damaging the tree.

Collection:
 Leaves: Collected for use in traditional medicine. **Bark**: Used for its medicinal properties. **Fruit**: The small fig-like fruits are sometimes used. **Roots**: Also used in certain herbal preparations.

Microscopic characteristics:
 Leaf Structure: The leaf of the Peepal plant has large, broad, and smooth surfaces. The stomata are located on the lower side, and the leaf is reticulate-veined. **Trichomes**: The epidermis may have glandular trichomes, and there may be some hairs on the undersurface of the leaves.

Uses:
 Respiratory System: The leaves, bark, and fruit of the Peepal tree are traditionally used in treating asthma, bronchitis, and other respiratory conditions.
 Antioxidant and Anti-inflammatory: The plant has significant antioxidant and anti-inflammatory properties, useful for managing conditions like arthritis.
 Diabetes: It is used in managing diabetes by regulating blood sugar levels.

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Bambu

Synonym:

Bamboo

Biological source:

It is obtain from plant Bamboo (generic term for various species within the genus **Bambusa**, **Phyllostachys**, and others) Giant bamboo Moso bamboo (a species used in various industries)

Family:

 Poaceae (Grass family) Some species of bamboo are in the **Bambusoideae** subfamily.

Chemical constituent:
 Cellulose (found in the fibrous parts of bamboo, making it ideal for paper and textiles) **Lignin** (a compound that provides strength to the bamboo) **Silica** (found in the bamboo's cell walls) **Flavonoids** (which have antioxidant properties)

Geographical source:
 Native to **Asia**, **Africa**, and **the Americas**. Bamboo is widely cultivated in **East Asia**, **Southeast Asia**, and **tropical regions**.

Cultivation:

 Bamboo grows best in **tropical** and **subtropical** regions, but some species also thrive in **temperate** climates. Prefers **well-drained soils** and can tolerate a wide range of soil types. Bamboo requires **full sunlight** and is generally grown in dense clusters.

Harvesting:

 Bamboo is harvested for its **young shoots** (used in culinary applications) and its **mature canes** (used for construction, crafts, and furniture). The **mature bamboo stalks** are cut down during the dry season to prevent rotting, and the canes are typically harvested after 3 to 5 years of growth.

Collection:

The **mature bamboo poles** are collected for construction or craft uses and are often processed into materials like **bamboo flooring**, **furniture**, **paper**, and **textiles**.

Microscopic characteristics:

 Bamboo has **vascular bundles** that are tightly packed, providing structural strength.
 The **bamboo stalks** contain **vascular tissue**, **phloem**, and **xylem** arranged in a characteristic manner.

Uses:

 Bamboo **shoots** are edible and are used in many Asian dishes. They can be cooked in soups, stir-fries, and curries.
 Young bamboo shoots are rich in **fiber**, **vitamins**, and **minerals**.

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Khat

Synonym:

Khat, Catha edulis, Abyssinian tea, Chat, Qat

Biological source:
Catha edulis, an evergreen shrub or small tree belonging to the family Celastraceae.

Family:

Celastraceae

Chemical constituent:
Cathinone, Cathine, Tannins, Flavonoids, Alkaloids, Saponins, Essential oils

Geographical source:
Native to East Africa (Ethiopia, Kenya, Somalia) and the Arabian Peninsula (Yemen, Saudi Arabia)

Cultivation:
Grows in tropical and subtropical climates, requires well-drained, fertile soil, propagated by seeds or cuttings

Harvesting:
Leaves are harvested fresh, typically in the morning, as the active compounds are highest when freshly picked

Collection:
Fresh leaves are collected; leaves are typically chewed, but sometimes dried or made into tea

Microscopic characteristics:
The leaves have a smooth surface with scattered glandular cells; the epidermis shows a distinct cuticle layer

Uses:
Used traditionally as a stimulant to improve mood, increase alertness, and reduce fatigue; some use it for weight loss or as an appetite suppressant

- **Antioxidant and Anti-inflammatory**: The plant has significant antioxidant and anti-inflammatory properties, useful for managing conditions like arthritis.
- **Diabetes**: It is used in managing diabetes by regulating blood sugar levels.

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Hirada

Synonym:

Terminalia chebula, Chebulic Myrobalan, Haritaki, Hirda, Indian walnut

Biological source:
It is obtain from Terminalia chebula, a deciduous tree belonging to the family **Combretaceae**.

Family:

Combretaceae

Chemical constituent:
Tannins (Chebulagic acid, Ellagic acid), Flavonoids, Gallic acid, Saponins, Essential oils, Alkaloids, Vitamin C, Glycosides

Geographical source:
Native to India, Nepal, Sri Lanka, Bangladesh, and other parts of Southeast Asia

Cultivation:
Grows in tropical and subtropical regions, requires well-drained soil, propagated by seeds, and is typically found in dry, arid regions

Harvesting:
The fruit is harvested when it is ripe, typically collected in the fall when the fruit falls from the tree

Collection:
The dried fruits, which are typically brown to black in color, are collected for use in traditional medicine

Microscopic characteristics:
The fruit has a smooth epidermis with distinct oil cells; the seed contains large endosperm cells filled with starch granules

Uses:
Used in traditional medicine for digestion, detoxification, boosting immunity, and treating conditions like constipation, ulcers, and asthma

In Ayurveda, Hirda is considered a tridoshic herb (balancing Vata, Pitta, and Kapha) and is part of many rejuvenating formulas

Grows naturally in dry regions, contributing to the soil's fertility by preventing erosion and providing shade

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Adulsa

Synonym:

Justicia adhatoda, Adulsa, Malabar Nut, Vasaka, Arusa

Biological source:
It is obtain from Justicia adhatoda, a perennial shrub belonging to the family **Acanthaceae**

Family:

Acanthaceae

Chemical constituent:
Vasicine, Vasicinone, Alkaloids, Flavonoids, Tannins, Glycosides, Saponins, Phenolic compounds

Geographical source:
Native to tropical Asia, found in India, Sri Lanka, Nepal, Bangladesh, and parts of Southeast Asia

Cultivation:
Grows in tropical and subtropical climates, prefers well-drained, fertile soil, propagated by seeds or cuttings

Harvesting:
Leaves and flowers are collected during the flowering season, typically in the rainy season when the plant is lush

Collection:
The leaves and flowers are used primarily in medicinal preparations, and they are typically dried for storage

Microscopic characteristics:
The leaf has a smooth surface, with characteristic glandular cells, and the leaf margin is often slightly serrated

Uses:
Used for respiratory disorders (cough, asthma), bronchodilator, expectorant, anti-inflammatory, antibacterial, and antifungal properties

Leaves and flowers are used in traditional remedies for treating cough, cold, and other lung diseases. The plant has applications in hair care and as an anti-venom in some traditions

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Chandan

Synonym:

Santalum album, Sandalwood, White Sandalwood, Chandan

Biological source:
It is obtain from Santalum album, a small evergreen tree belonging to the family **Santalaceae**

Family:

Santalaceae

Chemical constituent:
Santalol, Santalene, Santalene acetate, Linalool, Ximenynic acid, Phenolic compounds

Geographical source:
Native to India, particularly in the states of Karnataka, Tamil Nadu, and Kerala. Also found in Australia and other parts of Southeast Asia

Cultivation:
Grows in dry, sandy, well-drained soil; requires a host plant (parasitic in nature) to thrive. Typically propagated by seeds or grafting

Harvesting:
Sandalwood trees are usually harvested after 15-20 years, when the wood has matured and accumulated essential oils

Collection:
The heartwood is collected and processed for its essential oils; the tree is usually felled, and the bark and wood are separated

Microscopic characteristics:
The heartwood contains large parenchyma cells with abundant oil cavities; the xylem shows distinctive vessels and fibers

Uses:
Used as a calming agent in aromatherapy, for skin diseases (anti-inflammatory), treating anxiety, improving focus, and as an antiseptic

Sandalwood trees are parasitic, relying on other plants (usually leguminous plants) for nourishment, and are often grown in forests and plantations

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Jambhul

Synonym:

Syzygium cumini, Jamun, Jambhul, Java Plum, Black Plum, Indian Blackberry

Biological source:
It is obtain from Syzygium cumini, a tropical tree belonging to the family **Myrtaceae**.

Family:

Myrtaceae

Chemical constituent:
Tannins, Anthocyanins, Flavonoids, Alkaloids, Gallic acid, Eugenol, Sugars, Vitamins (A, C)

Geographical source:
Native to the Indian subcontinent, also found in Southeast Asia, including Bangladesh, Sri Lanka, and Myanmar

Cultivation:
Grows in tropical and subtropical climates, prefers well-drained soil, and is propagated by seeds or stem cuttings

Harvesting:
The fruit is harvested during the monsoon season when it ripens, typically from June to August in India

Collection:
The ripe fruits, which are purple to black in color, are collected; the seeds, leaves, and bark are also used for medicinal purposes

Microscopic characteristics:
The fruit has a smooth, purple skin with a single seed inside. The leaves show parallel venation, and the epidermis contains glandular cells for oil secretion

Uses:
Used to manage diabetes (lowers blood sugar levels), aids digestion, treats diarrhea, has antimicrobial properties, and is used for improving oral health (anti-inflammatory and antimicrobial)

The tree helps prevent soil erosion, and its fruit provides food for birds and animals; it is often grown along roadsides and in forests

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Avala

Synonym:

Phyllanthus emblica, Amla, Indian Gooseberry, Amalaki, Emblica officinalis

Biological source:
Phyllanthus emblica, a deciduous shrub or small tree belonging to the family **Euphorbiaceae**

Family:

Euphorbiaceae

Chemical constituent:
Vitamin C, Tannins, Flavonoids, Gallic acid, Ellagic acid, Phyllemblin, Amino acids, Polysaccharides

Geographical source:
Native to India, Southeast Asia, and parts of the Middle East; widely cultivated in tropical and subtropical regions

Cultivation:
Grows in well-drained, loamy soil with a warm climate; propagated by seeds, cuttings, or grafting

Harvesting:
The fruits are harvested when fully ripe, typically in the winter season when they turn light yellow to pale green

Collection:
The fruits, which are round, green to yellow in color, are collected and dried for storage; the leaves and seeds are also used in traditional medicine

Microscopic characteristics:
The fruit has a smooth outer skin with visible glandular cells that secrete oil; the leaves are small with fine, parallel venation, and the bark contains resinous cells

Uses:
Boosts immunity, improves digestion, aids in liver function, reduces cholesterol, controls blood sugar, acts as a detoxifier, and is used to treat cough, cold, and sore throat

Amla is consumed as a fresh fruit, in the form of juice, or used in culinary dishes; its powder is used in cosmetics and hair care products for promoting hair health

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Custard Apple

Synonym:

Annona squamosa, Custard Apple, Sugar Apple, Sitaphal, Cherimoya

Biological source:
Annona squamosa, a small deciduous tree or shrub belonging to the family **Annonaceae**

Family:

Annonaceae

Chemical constituent:
Alkaloids, Tannins, Flavonoids, Carbohydrates, Vitamin C, Essential oils, Protein, Calcium, Iron

Geographical source:
Native to the tropical Americas, now widely cultivated in India, Southeast Asia, Africa, and other tropical regions

Cultivation:
Grows in tropical and subtropical climates, prefers well-drained, sandy loam soil, propagated by seeds or grafting

Harvesting:
The fruit is harvested when it turns soft to the touch, typically after 3 to 4 months of flowering, and it ripens further off the tree

Collection:
The mature fruits, which have a scaly, greenish skin, are harvested; the seeds and leaves are also used for medicinal purposes

Microscopic characteristics:
The fruit has a fleshy, edible pulp with a smooth, creamy texture; the seeds are black and shiny, and the leaves are simple with pinnate venation

Uses:
Used for treating digestive issues (diarrhea, constipation), controlling blood sugar levels, relieving cough and cold, and promoting heart health. It is also used as a sedative and for skin disorders

Provides shade and food for various animals, particularly in tropical regions; it can be used in agroforestry systems to enhance biodiversity

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Aloe vera

Synonym:

Aloe barbadensis miller, Aloe Vera, Aloe, True Aloe, Medicinal Aloe

Biological source:
Aloe vera, a succulent plant belonging to the family **Asphodelaceae**

Family:

Asphodelaceae

Chemical constituent:
Aloe emodin, Anthraquinones, Polysaccharides, Glycoproteins, Saponins, Amino acids, Vitamins (A, C, E), Minerals (Calcium, Magnesium, Zinc)

Geographical source:
Native to the Arabian Peninsula, now widely cultivated in tropical and subtropical regions worldwide

Cultivation:
Grows well in dry, sandy, well-drained soil with plenty of sunlight. Aloe vera is propagated by **offsets** or **cuttings**

Harvesting:
The leaves are harvested when they are mature, typically by cutting the outer leaves at the base of the plant

Collection:
The gel is collected from the inner portion of the leaves, which is used in various medicinal and cosmetic products

Microscopic characteristics:
The leaves are thick and fleshy, with a transparent inner gel containing high amounts of water. The epidermis is waxy and protects the plant from dehydration.

Uses:
Used topically for wound healing, burns, skin irritation, and moisturizing; orally for digestive health (constipation relief) and boosting immunity

Aloe vera is widely used in the cosmetic and pharmaceutical industries in lotions, creams, shampoos, and as a food additive; its juice is consumed for detoxification and digestive benefits

In some cultures, Aloe Vera is believed to bring good luck, and it is used in traditional remedies for skin care and healing

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Castor

Synonym:

castor plant (*Ricinus communis*)

Biological source:
Biological Source Origin, Source organism, Source species The biological source of the plant, Ricinus communis, is the species from which the plant is derived. Castor is a species of flowering plant in the Euphorbiaceae family.

Family:

Euphorbiaceae

Chemical constituent:
Active ingredient, Chemical component The active compounds found in Ricinus communis include Ricin, a toxic protein, and Ricinoleic acid, the primary fatty acid found in castor oil, known for its medicinal and industrial applications

Geographical source:
eographical origin, Geographical location Ricinus communis is native to tropical and subtropical regions of Africa and Asia but is now widely cultivated in many parts of the world for its oil.

Cultivation:
Cultivation Farming, Growing, Agricultural practice Castor is cultivated for its seeds, which contain oil, particularly in tropical and subtropical regions. It grows well in well-drained soils and thrives in warm climates.

Harvesting:
Collection, Gathering, Reaping Harvesting refers to the collection of mature castor beans (seeds) from the plant once they have ripened. The seeds are the main source of castor oil.

Collection:
Gathering, Harvesting, Accumulation Collection involves gathering plant materials such as castor seeds or leaves for use in medicinal, cosmetic, or industrial applications.

Microscopic characteristics:
Microscopic features, Microscopic traits, Microstructural characteristics Features observed under a microscope, such as the structure of the castor seed and the arrangement of vascular tissues, which are important for identification and understanding the plant's properties.

Uses:
Applications, Benefits, Medicinal uses, Purposes The plant is used primarily for extracting castor oil, which has numerous applications in medicine (laxatives, skin care), industry (lubricants, biodiesel), and cosmetics. The seeds, however, contain ricin, a highly toxic protein.

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Coriander

Synonym:

Cilantro, Chinese parsley, Dhania+

Biological source:

Coriander consists of the dried ripe fruits of *Coriandrum sativum* L., belonging to the family **Apiaceae** (Umbelliferae).

Family:

Apiaceae (Umbelliferae)

Chemical constituent:

Essential oils: Linalool (coriandrol), geraniol, camphor, borneol **Flavonoids**: Quercetin, kaempferol **Fatty acids**: Petroselinic acid, oleic acid, linoleic acid **Vitamins**: Vitamin C, Vitamin A

Geographical source:

Native to **Southern Europe, North Africa, Western Asia** Cultivated in **India, China, Russia, Morocco, Egypt, USA, Latin America**

Cultivation:

Grows well in **temperate and tropical climates** Prefers **well-drained loamy soil** Requires **full sunlight** Sown in **autumn or early spring**

Harvesting:

- Harvested when **fruits turn brown and aromatic** - Plants are **cut, dried, threshed, and cleaned** - Stored in **dry conditions**

Collection:

- Harvested when **fruits turn brown and aromatic**
- Plants are **cut, dried, threshed, and cleaned**
- Stored in **dry conditions**

Microscopic characteristics

- **Epicarp**: Polygonal cells with wavy walls
- **Mesocarp**: Large parenchyma cells with oil ducts
- **Endocarp**: Rectangular thick-walled cells
- **Vascular bundles**: Present in ridges of the fruit

USES

- **Culinary**: Used as a spice (leaves & seeds)
- **Medicinal**: Carminative, digestive aid, antioxidant, anti-inflammatory, treats diarrhea & colic
- **Cosmetic**: Used in perfumes & skincare
- **Aromatherapy**: Essential oil for relaxation & stress relief

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Datura

Synonym:

Thorn apple, Jimson weed, Devil's trumpet, Stinkweed

Biological source:

Dried leaves and seeds of *Datura stramonium*, *Datura metel*, or *Datura innoxia*

Family:

Solanaceae

Chemical constituent:

- **Alkaloids**: Hyoscyamine, Atropine, Scopolamine (Hyoscine)
- **Flavonoids**
- **Tannins**
- **Sterols**

Geographical source:

Native to **North and South America**
Widely found in **India, Europe, Africa, and China**

Cultivation:

- Grows in **tropical and temperate climates**
- Requires **well-drained soil, rich in organic matter**
- Thrives in **warm, sunny environments**
- Propagated by **seeds**

Harvesting:

- Leaves and seeds are **collected at full maturity**
- Dried under **shade to preserve alkaloids**
- Stored in **airtight containers** to prevent loss of active constituents

Collection:

- Leaves and seeds are **collected at full maturity** - Dried under **shade to preserve alkaloids** - Stored in **airtight containers** to prevent loss of active constituents

Microscopic characteristics

- **Leaf**: Anisocytic stomata, unicellular trichomes
- **Seed**: Outer epidermis shows thick-walled cells with pits
- **Trichomes**: Multicellular, covering trichomes present on leaves

USES

- **Medicinal**: Used as an **anticholinergic, sedative, and bronchodilator**
- **Treats**: Asthma, muscle spasms, and motion sickness
- **Toxicity**: Highly toxic in large doses, can cause hallucinations and poisoning
- **Religious & Ritual Use**: Used in some cultural ceremonies

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Lemon

Synonym:

Nimbu (Hindi), Limón, Citron, Lime (sometimes confused)

Biological source:

Fruits, leaves, and essential oil obtained from *Citrus limon*

Family:

Rutaceae

Chemical constituent:

- **Flavonoids**: Hesperidin, Rutin
- **Vitamins**: Vitamin C (Ascorbic acid), Vitamin B-complex
- **Essential oils**: Limonene, Citral, Linalool
- **Organic acids**: Citric acid, Malic acid

Geographical source:

Native to **South Asia (India, China, and Myanmar region)**
Cultivated in **India, USA, Italy, Spain, Brazil, Mexico, and Mediterranean regions**

Cultivation:

- Grows in **tropical and temperate climates**
- Requires **well-drained soil, rich in organic matter**
- Thrives in **warm, sunny environments**
- Propagated by **seeds**

Harvesting:

- Fruits are harvested when **fully matured and yellow**
- Collected manually or mechanically
- Essential oil extracted from **peel by cold pressing**

Collection:

- Fruits are harvested when **fully matured and yellow** - Collected manually or mechanically - Essential oil extracted from **peel by cold pressing**

Microscopic characteristics

- **Leaf**: Glandular trichomes, anisocytic stomata
- **Fruit Peel**: Oil glands present, parenchymatous cells rich in Vitamin C
- **Seeds**: Endosperm rich in proteins and oils

USES

- **Medicinal**: Rich in Vitamin C, boosts immunity, improves digestion
- **Culinary**: Used in beverages, cooking, and flavoring
- **Cosmetic**: Used in skincare, hair care, and essential oils
- **Aromatherapy**: Lemon oil used for relaxation and stress relief

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Orange

Synonym:

Sweet Orange, Narangi (Hindi), China Orange

Biological source:

The fruit, peel, leaves, and essential oil are obtained from *Citrus sinensis* (Sweet Orange) and *Citrus aurantium* (Bitter Orange). It belongs to the **Rutaceae** family. The fruit is rich in Vitamin C and flavonoids, making it valuable for medicinal and culinary uses.

Family:

Rutaceae

Chemical constituent:

- **Flavonoids**: Hesperidin, Naringin, Rutin
- **Vitamins**: Vitamin C, Vitamin A, B-complex
- **Essential oils**: Limonene, Citral, Linalool
- **Carbohydrates**: Fructose, Glucose

Geographical source:

Native to **China and India**
Major producers: **Brazil, USA, India, Spain, Mexico, Italy**

Cultivation:

- Grows well in **subtropical and tropical climates**
- Prefers **well-drained sandy loam soil**
- Requires **full sunlight and moderate irrigation**
- Propagated by **seeds, grafting, or budding**

Harvesting:

- Fruits are harvested when **fully ripened (bright orange color)**
- Collected manually or mechanically
- Essential oil is extracted from **peel by cold pressing**

Collection:

- Fruits are harvested when **fully ripened (bright orange color)** - Collected manually or mechanically - Essential oil is extracted from **peel by cold pressing**

Microscopic characteristics

- **Leaf**: Glandular trichomes, anisocytic stomata
- **Fruit Peel**: Oil glands with volatile oils, parenchymatous cells
- **Seeds**: Large cotyledons, rich in oils and proteins

USES

- **Medicinal**: Boosts immunity, antioxidant, digestive aid
- **Culinary**: Used in juices, desserts, flavoring
- **Cosmetic**: Used in skincare, perfumes, essential oils
- **Aromatherapy**: Orange oil for relaxation and stress relief

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Lemon Grass

Synonym:

West Indian Lemongrass, Bhustrina (Hindi), Citronella Grass

Biological source:

Lemongrass consists of the fresh or dried leaves and essential oil obtained from *Cymbopogon citratus* and *Cymbopogon flexuosus*. It belongs to the **Poaceae (Gramineae)** family. The essential oil is rich in **Citral**, which gives it a strong lemon-like aroma.

Family:

Poaceae (Gramineae)

Chemical constituent:

- **Essential oils**: Citral, Geraniol, Linalool, Myrcene
- **Flavonoids**: Luteolin, Quercetin
- **Tannins, Saponins, and Alkaloids**

Geographical source:

Native to **India, Sri Lanka, and Southeast Asia**
Major producers: **India, China, Thailand, Brazil, Indonesia, Africa**

Cultivation:

- Grows well in **tropical and subtropical climates**
- Prefers **well-drained sandy loam soil with high organic content**
- Requires **full sunlight and moderate watering**
- Propagated by **seeds or root division**

Harvesting:

- Harvested **3 to 4 times a year** when the leaves are **40–60 cm tall**
- Cut **5–10 cm above ground level** to allow regrowth
- Essential oil is extracted by **steam distillation** of fresh leaves

Collection:

3 to 4 times a year when the leaves are **40–60 cm tall** - Cut **5–10 cm above ground level** to allow regrowth - Essential oil is extracted by **steam distillation** of fresh leaves

Microscopic characteristics

- **Leaf**: Long, narrow, parallel veins, oil glands present
- **Trichomes**: Few unicellular trichomes
- **Stem**: Hollow with vascular bundles

USES

- **Medicinal**: Antibacterial, antifungal, digestive aid, stress reliever
- **Culinary**: Used in teas, soups, curries, and flavoring
- **Cosmetic**: Used in skincare, soaps, perfumes
- **Aromatherapy**: Essential oil used for relaxation and insect repellent

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Tulsi

Synonym:

Holy Basil, Tulasi, Sacred Basil

Biological source:

Tulsi consists of the leaves, seeds, and essential oil obtained from *Ocimum sanctum* (Rama Tulsi) and *Ocimum tenuiflorum* (Krishna Tulsi). It belongs to the **Lamiaceae** family and is rich in bioactive compounds like **Eugenol and Ursolic acid**.

Family:

Lamiaceae (Mint family)

Chemical constituent:

- **Essential oils**: Eugenol, Methyl eugenol, Linalool
- **Flavonoids**: Apigenin, Luteolin
- **Tannins, Saponins, Alkaloids**

Geographical source:

Native to **India and Southeast Asia**
Cultivated in **India, Nepal, Thailand, Sri Lanka, and some parts of Africa**

Cultivation:

- Grows well in **tropical and subtropical climates**
- Prefers **well-drained, fertile soil with moderate moisture**
- Requires **full sunlight**
- Propagated by **seeds and cuttings**

Harvesting:

- Leaves are harvested **before flowering** for medicinal use
- Collected **manually** and dried under shade to preserve essential oils
- Seeds are harvested **after full maturity**

Collection:

- Leaves are harvested **before flowering** for medicinal use - Collected **manually** and dried under shade to preserve essential oils - Seeds are harvested **after full maturity**

Microscopic characteristics

- **Leaf**: Stomata are diacytic, glandular trichomes present
- **Stem**: Square-shaped, covered with fine hairs
- **Oil glands**: Present in leaves and stems

USES

- **Medicinal**: Immunity booster, anti-inflammatory, antioxidant, antimicrobial
- **Culinary**: Used in herbal teas, Ayurvedic preparations
- **Cosmetic**: Used in skincare, haircare, essential oils
- **Aromatherapy**: Tulsi oil used for stress relief and relaxation

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Henna

Synonym:

Mehendi, Egyptian Privet, Hina

Biological source:

Henna consists of the dried leaves and powdered form of *Lawsonia inermis*, belonging to the **Lythraceae** family. The active dye compound **Lawsone** is responsible for its coloring properties.

Family:

Lythraceae

Chemical constituent:

- **Dye Compound**: Lawsone (2-hydroxy-1,4-naphthoquinone)
- **Flavonoids**: Luteolin, Apigenin
- **Tannins, Resins, Gallic acid**

Geographical source:

Native to **North Africa, South Asia, and the Middle East**
Cultivated in **India, Pakistan, Egypt, Iran, Sudan, and Morocco**

Cultivation:

- Grows well in **hot, arid, and tropical climates**
- Prefers **sandy or loamy well-drained soil**
- Requires **full sunlight and minimal water**
- Propagated by **seeds and stem cuttings**

Harvesting:

- Leaves are harvested **twice a year (spring and autumn)**
- Collected manually and **shade-dried** to retain lawsone content
- Ground into **fine powder** for dyeing applications

Collection:

- Collected manually and **shade-dried** to retain lawsone content - Ground into **fine powder** for dyeing applications

Microscopic characteristics

- **Leaf**: Upper epidermis with **unicellular trichomes** and anomocytic stomata
- **Mesophyll**: Palisade cells rich in **lawsone pigment**
- **Vascular Bundle**: Xylem and phloem well developed

USES

- **Cosmetic**: Natural hair dye, body art (Mehendi), temporary tattoos
- **Medicinal**: Antifungal, antibacterial, cooling agent, wound healing
- **Textile Industry**: Used as a natural dye for fabrics
- **Religious & Cultural**: Used in weddings, festivals, and traditional ceremonies

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Approved by P.C.I. New Delhi, D.T.E. Mumbai, Govt. of Maharashtra &
Affiliated to D.B.A.T.U. Lonere, Raigad, M.S.B.T.E. Mumbai.
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Garlic

Synonym:

Lahsun (Hindi), Rasona, Poor Man's Treacle

Biological source:

Garlic consists of the **bulb (cloves)** obtained from *Allium sativum*, belonging to the **Amaryllidaceae** family. It is rich in **organosulfur compounds**, which contribute to its medicinal properties.

Family:

Amaryllidaceae (Previously Liliaceae)

Chemical constituent:

- **Sulfur Compounds**: Allicin, Alliin, Diallyl sulfide
- **Flavonoids**: Quercetin, Kaempferol
- **Vitamins**: Vitamin C, B6
- **Minerals**: Selenium, Zinc, Manganese

Geographical source:

Native to **Central Asia, Iran, and India**
Major producers: **China, India, Egypt, USA, Spain**

Cultivation:

- Grows well in **temperate and subtropical climates**
- Prefers **well-drained sandy loam soil** with moderate moisture
- Requires **full sunlight**
- Propagated by **planting cloves** instead of seeds

Harvesting:

- Harvested when **leaves turn yellow and dry** (about 6 months after planting)
- Bulbs are **dug out, dried in shade, and stored** in ventilated conditions
- Essential oil extracted by **steam distillation**

Collection:

- Harvested when **leaves turn yellow and dry** (about 6 months after planting) - Bulbs are **dug out, dried in shade, and stored** in ventilated conditions

Microscopic characteristics

- **Epidermis**: Thin-walled polygonal cells
- **Vascular Bundles**: Well developed in cloves
- **Sulfur-containing oil cells** present

USES

- **Medicinal**: Antibacterial, antifungal, lowers blood pressure, cholesterol control
- **Culinary**: Used as a spice and flavoring agent
- **Cosmetic**: Used in herbal hair and skincare products
- **Traditional Medicine**: Used in Ayurveda and Chinese medicine for immunity boosting

Evaluated By:

Principal

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Ginger

Synonym:

Adrak (Hindi), Shunthi (Sanskrit), Ingwer (German)

Biological source:

Ginger consists of the **rhizome** of *Zingiber officinale*, belonging to the **Zingiberaceae** family. It contains **gingerols and shogaols**, which contribute to its medicinal and aromatic properties.

Family:

Zingiberaceae

Chemical constituent:

- **Phenolic Compounds**: Gingerol, Shogaol, Zingerone
- **Essential Oils**: Camphene, Linalool, Borneol
- **Vitamins & Minerals**: Vitamin C, Magnesium, Potassium

Geographical source:

Native to **Southeast Asia and India**
Major producers: **India, China, Nigeria, Indonesia, Thailand**

Cultivation:

- Grows well in **tropical and subtropical climates**
- Requires **loamy, well-drained, and humus-rich soil**
- Prefers **warm temperatures and moderate rainfall**
- Propagated by **rhizome division**

Harvesting:

- Harvested **6-8 months after planting** when rhizomes mature
- Dug out, cleaned, and **sun-dried** for medicinal use
- Used fresh, dried, or as an essential oil extract

Collection:

- Harvested **6-8 months after planting** when rhizomes mature - Dug out, cleaned, and **sun-dried** for medicinal use - Used fresh, dried, or as an essential oil extract

Microscopic characteristics

- **Rhizome**: Parenchymatous cells rich in starch
- **Vascular Bundles**: Scattered, with oil cells
- **Cork Layer**: Contains suberized cells

USES

- **Medicinal**: Anti-inflammatory, digestive aid, nausea relief, antioxidant
- **Culinary**: Used in teas, curries, and flavoring agents
- **Cosmetic**: Used in skincare and haircare products
- **Aromatherapy**: Essential oil used for relaxation and pain relief

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Clove

Synonym:

Laung (Hindi), Caryophyllus, Clou de girofle (French)

Biological source:

Clove consists of the **dried flower buds** of *Syzygium aromaticum*, belonging to the **Myrtaceae** family. It is rich in **eugenol**, which gives it medicinal and aromatic properties.

Family:

Myrtaceae

Chemical constituent:

- **Essential Oils**: Eugenol, Caryophyllene, Eugenyl acetate
- **Tannins**: Gallic acid
- **Flavonoids**: Quercetin, Kaempferol
- **Resins, Volatile oils**

Geographical source:

Native to **Indonesia and the Maluku Islands (Spice Islands)**
Major producers: **Indonesia, Madagascar, India, Sri Lanka, Tanzania**

Cultivation:

- Grows well in **tropical and humid climates**
- Prefers **loamy, well-drained, and fertile soil**
- Requires **moderate rainfall and warm temperatures**
- Propagated by **seeds and root cuttings**

Harvesting:

- Flower buds are harvested **before blooming** when they turn **pink**
- Dried under the sun or in drying chambers to preserve **essential oils**
- Stored in **airtight containers** to retain flavor and aroma

Collection:

- Flower buds are harvested **before blooming** when they turn **pink** - Dried under the sun or in drying chambers to preserve **essential oils** - Stored in **airtight containers** to retain flavor and aroma

Microscopic characteristics

- **Epidermis**: Thick-walled cells with oil glands
- **Vascular Bundles**: Well-developed with xylem and phloem
- **Parenchyma**: Contains abundant oil cells rich in eugenol

USES

- **Medicinal**: Antiseptic, analgesic (toothache relief), antimicrobial, digestive aid
- **Culinary**: Used in spices, flavoring, and beverages
- **Cosmetic**: Used in perfumes, toothpaste, and skincare products
- **Aromatherapy**: Clove oil used for pain relief and stress reduction

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Cinnamon

Synonym:

Dalchini (Hindi), True Cinnamon, Ceylon Cinnamon

Biological source:

Cinnamon consists of the **dried inner bark** of *Cinnamomum verum* (Ceylon cinnamon) and *Cinnamomum cassia* (Cassia cinnamon), belonging to the **Lauraceae** family. The bark contains **cinnamaldehyde**, which gives it its distinct aroma and medicinal properties.

Family:

Lauraceae

Chemical constituent:

- **Essential Oils**: Cinnamaldehyde, Eugenol, Linalool
- **Tannins**: Catechins
- **Flavonoids**: Kaempferol, Quercetin
- **Coumarins, Mucilage**

Geographical source:

Native to **Sri Lanka, India, and Myanmar**
Major producers: **Sri Lanka, Indonesia, China, Vietnam, Madagascar**

Cultivation:

- Grows well in **tropical and subtropical climates**
- Prefers **well-drained sandy or loamy soil** with high organic content
- Requires **warm temperatures and moderate rainfall**
- Propagated by **seeds or stem cuttings**

Harvesting:

- Bark is harvested from **2-3 year-old plants** by peeling the outer bark
- Inner bark is **scraped, rolled, and dried** into cinnamon quills
- Stored in **airtight containers** to retain aroma and potency

Collection:

- Bark is harvested from **2-3 year-old plants** by peeling the outer bark - Inner bark is **scraped, rolled, and dried** into cinnamon quills - Stored in **airtight containers** to retain aroma and potency

Microscopic characteristics

- **Cork Layer**: Thin-walled cells
- **Phloem**: Contains stone cells and oil glands
- **Medullary Rays**: Well-developed with lignified parenchyma

USES

- **Medicinal**: Antioxidant, anti-inflammatory, blood sugar control, digestive aid
- **Culinary**: Used in baking, spice blends, teas, and flavoring
- **Cosmetic**: Used in perfumes, skincare, and oral care products
- **Aromatherapy**: Cinnamon oil used for relaxation and antimicrobial benefits

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Vinca

Synonym:

Madagascar Periwinkle, Sadabahar (Hindi), Old Maid

Biological source:

Vinca consists of the **whole plant** of *Catharanthus roseus*, belonging to the **Apocynaceae** family. It is rich in **alkaloids like vincristine and vinblastine**, which have anticancer properties.

Family:

Apocynaceae

Chemical constituent:

- **Alkaloids**: Vincristine, Vinblastine, Ajmalicine, Reserpine
- **Flavonoids**: Quercetin, Kaempferol
- **Tannins, Saponins, Glycosides**

Geographical source:

Native to **Madagascar**
Cultivated in **India, Sri Lanka, Australia, Africa, USA**

Cultivation:

- Grows well in **tropical and subtropical climates**
- Prefers **well-drained sandy loam soil**
- Requires **full sunlight** and moderate watering
- Propagated by **seeds and stem cuttings**

Harvesting:

- Leaves and stems are harvested **before flowering** for alkaloid extraction
- Roots are collected after **maturity** for medicinal use
- Dried under **shade** to preserve active compounds

Collection:

- Leaves and stems are harvested **before flowering** for alkaloid extraction - Roots are collected after **maturity** for medicinal use - Dried under **shade** to preserve active compounds

Microscopic characteristics

- **Leaf**: Anisocytic stomata, glandular trichomes present
- **Stem**: Circular with well-developed phloem and xylem
- **Vascular Bundles**: Collateral, surrounded by sclerenchymatous cells

USES

- **Medicinal**: Used in cancer treatment (leukemia, lymphoma), blood pressure regulation, diabetes control
- **Traditional Medicine**: Used in Ayurveda and Chinese medicine
- **Ornamental**: Grown as a decorative flowering plant in gardens

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Mulberry

Synonym:

Shahtoot (Hindi), White Mulberry, Morus

Biological source:

Mulberry consists of the **leaves, fruits, and bark** of *Morus alba* (White Mulberry), *Morus nigra* (Black Mulberry), and *Morus rubra* (Red Mulberry), belonging to the **Moraceae** family.

Family:

Moraceae

Chemical constituent:

- **Alkaloids**: Morin, DNJ (1-Deoxynojirimycin)
- **Flavonoids**: Quercetin, Kaempferol
- **Tannins, Anthocyanins, Resveratrol**
- **Vitamins & Minerals**: Vitamin C, Iron, Calcium

Geographical source:

Native to **China, India, and Central Asia**
Major producers: **China, India, USA, Turkey, Italy**

Cultivation:

- Grows well in **temperate and subtropical climates**
- Prefers **well-drained fertile loamy soil**
- Requires **moderate sunlight and water**
- Propagated by **seeds, cuttings, or grafting.**

Harvesting:

- **Leaves**: Harvested for silk industry (sericulture) and medicinal use
- **Fruits**: Collected when fully ripe (dark purple/black) for food and medicine
- **Bark & Roots**: Dried and used in traditional medicine

Collection:

- **Leaves**: Harvested for silk industry (sericulture) and medicinal use - **Fruits**: Collected when fully ripe (dark purple/black) for food and medicine - **Bark & Roots**: Dried and used in traditional medicine

Microscopic characteristics

- **Leaf**: Anisocytic stomata, unicellular trichomes present
- **Stem**: Circular, with well-developed phloem and xylem
- **Vascular Bundles**: Collateral, surrounded by sclerenchymatous fibers

USES

- **Medicinal**: Antidiabetic, antioxidant, liver protection, blood pressure control
- **Sericulture**: Leaves used as food for silkworms (Bombyx mori)
- **Culinary**: Fruits used in jams, juices, wines, and herbal teas
- **Cosmetic**: Extracts used in skincare for anti-aging and pigmentation reduction

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Mogra

Synonym:

Arabian Jasmine, Malli (Tamil), Bela (Hindi)

Biological source:

Mogra consists of the **flowers, leaves, and essential oil** obtained from *Jasminum sambac*, belonging to the **Oleaceae** family. The plant is widely used for its fragrance and medicinal properties.

Family:

Oleaceae

Chemical constituent:

- **Essential Oils**: Benzyl acetate, Linalool, Eugenol, Farnesol
- **Flavonoids**: Quercetin, Rutin
- **Alkaloids, Saponins, Tannins**

Geographical source:

Native to **India, Southeast Asia, and the Arabian Peninsula**
Cultivated in **India, China, Thailand, the Philippines, and Indonesia**

Cultivation:

- Grows well in **tropical and subtropical climates**
- Prefers **well-drained loamy or sandy soil**
- Requires **full sunlight and moderate watering**
- Propagated by **stem cuttings and layering**

Harvesting:

- **Flowers** are harvested in the early morning for fragrance retention
- **Leaves and stems** collected for medicinal and cosmetic use
- Essential oil extracted by **steam distillation or solvent extraction**

Collection:

- **Flowers** are harvested in the early morning for fragrance retention - **Leaves and stems** collected for medicinal and cosmetic use - Essential oil extracted by **steam distillation or solvent extraction**

Microscopic characteristics

- **Petals**: Thin-walled epidermis with oil glands
- **Leaf**: Anomocytic stomata, glandular trichomes
- **Vascular Bundles**: Well-developed xylem and phloem

USES

- **Aromatherapy & Perfumery**: Essential oil used in perfumes, incense, and scented products
- **Medicinal**: Antiseptic, stress reliever, aphrodisiac, and skin tonic
- **Religious & Cultural**: Used in garlands, temple offerings, and ceremonies
- **Cosmetic**: Used in skincare, hair oils, and beauty products

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Rose

Synonym:

Gulab (Hindi), Queen of Flowers

Biological source:

Rose consists of the **flowers, petals, and essential oil** obtained from various *Rosa* species, mainly *Rosa damascena*, *Rosa centifolia*, and *Rosa indica*, belonging to the **Rosaceae** family.

Family:

Rosaceae

Chemical constituent:

- **Essential Oils**: Geraniol, Citronellol, Nerol
- **Flavonoids**: Quercetin, Kaempferol
- **Tannins, Saponins, Anthocyanins**
- **Vitamins & Minerals**: Vitamin C, Calcium, Iron

Geographical source:

Native to **Asia, Europe, and North America**
Major producers: **India, Bulgaria, Turkey, Iran, France, China**

Cultivation:

- Grows well in **temperate and subtropical climates**
- Prefers **well-drained loamy or sandy soil**
- Requires **full sunlight and regular watering**
- Propagated by **cuttings, grafting, or seeds**

Harvesting:

- **Flowers** are harvested in the early morning for maximum fragrance
- **Petals** are dried for herbal teas, powders, and perfumes
- **Rose oil** extracted through **steam distillation or solvent extraction**

Collection:

- **Flowers** are harvested in the early morning for maximum fragrance - **Petals** are dried for herbal teas, powders, and perfumes - **Rose oil** extracted through **steam distillation or solvent extraction**

Microscopic characteristics

- **Petals**: Thin-walled cells with pigmented epidermis
- **Leaf**: Anisocytic stomata, glandular trichomes
- **Vascular Bundles**: Collateral, with well-developed xylem and phloem

USES

- **Aromatherapy & Perfumery**: Rose oil used in perfumes, incense, and scented products
- **Medicinal**: Antioxidant, anti-inflammatory, stress reliever, skin toner
- **Culinary**: Rose water used in sweets, beverages, and herbal teas
- **Cosmetic**: Used in skincare, hair oils, and beauty products

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Guava

Synonym:

Amrood (Hindi), Guayaba (Spanish), Perala (Tamil)

Biological source:

Guava consists of the **leaves, fruits, and bark** of *Psidium guajava*, belonging to the **Myrtaceae** family. The plant is valued for its medicinal, nutritional, and economic benefits.

Family:

Myrtaceae

Chemical constituent:

- **Flavonoids**: Quercetin, Kaempferol
- **Tannins**: Gallic acid, Ellagic acid
- **Vitamins & Minerals**: Vitamin C, A, Potassium, Iron
- **Essential Oils**: Eugenol, Limonene

Geographical source:

Native to **Central and South America**
Major producers: **India, Brazil, Mexico, Thailand, Indonesia**

Cultivation:

- Grows well in **tropical and subtropical climates**
- Prefers **well-drained sandy or loamy soil**
- Requires **moderate watering and full sunlight**
- Propagated by **seeds, grafting, or air layering**

Harvesting:

- **Fruits** harvested **when mature but still firm** for better shelf life
- **Leaves & Bark** collected year-round for medicinal use
- Fruits stored at **cool temperatures** to prevent spoilage.

Collection:

- **Fruits** harvested **when mature but still firm** for better shelf life - **Leaves & Bark** collected year-round for medicinal use - Fruits stored at **cool temperatures** to prevent spoilage

Microscopic characteristics

- **Leaf**: Anisocytic stomata, glandular trichomes present
- **Stem**: Circular with well-developed vascular tissue
- **Vascular Bundles**: Collateral, surrounded by sclerenchymatous fibers

USES

- **Medicinal**: Antioxidant, antidiabetic, digestive aid, antimicrobial
- **Nutritional**: Rich in vitamin C, fiber, and antioxidants
- **Culinary**: Used in juices, jams, salads, and desserts
- **Cosmetic**: Extracts used in skincare and haircare products

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Pomegranate

Synonym:

Anar (Hindi), Dalim (Bengali), Rumman (Arabic)

Biological source:

Pomegranate consists of the **fruits, seeds, bark, and leaves** of *Punica granatum*, belonging to the **Lythraceae** family. The plant is valued for its high antioxidant content and medicinal benefits.

Family:

Lythraceae

Chemical constituent:

- **Polyphenols**: Punicalagins, Ellagic acid
- **Flavonoids**: Quercetin, Kaempferol
- **Vitamins & Minerals**: Vitamin C, K, Iron, Potassium
- **Tannins**: Gallic acid, Ellagitannins

Geographical source:

Native to **Iran and Northern India**
Major producers: **India, Iran, China, USA, Turkey, Egypt**

Cultivation:

- Grows well in **tropical and subtropical climates**
- Prefers **well-drained loamy or sandy soil**
- Requires **full sunlight and moderate watering**
- Propagated by **seeds, cuttings, or grafting**

Harvesting:

- **Fruits** harvested **when fully ripe** (deep red color)
- **Bark & Leaves** collected for medicinal use
- Fruits stored in **cool, dry places** to extend shelf life

Collection:

- **Fruits** harvested **when fully ripe** (deep red color) - **Bark & Leaves** collected for medicinal use - Fruits stored in **cool, dry places** to extend shelf life

Microscopic characteristics

- **Leaf**: Anisocytic stomata, unicellular trichomes present
- **Stem**: Circular with well-developed xylem and phloem
- **Vascular Bundles**: Collateral, surrounded by sclerenchymatous cells

USES

- **Medicinal**: Antioxidant, anti-inflammatory, heart health, digestion aid
- **Nutritional**: Rich in vitamins and polyphenols
- **Culinary**: Used in juices, salads, desserts, and garnishes
- **Cosmetic**: Extracts used in anti-aging and skin-brightening products

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Kadipatta

Synonym:

Kadipatta (Hindi), Sweet Neem, Curry Leaves, Karuveppilai (Tamil), Meetha Neem

Biological source:

Curry leaf consists of the **leaves, bark, and roots** of *Murraya koenigii*, belonging to the **Rutaceae** family. It is widely used in culinary and medicinal applications.

Family:

Rutaceae

Chemical constituent:

- **Alkaloids**: Mahanimbine, Girinimbine, Koenimbine
- **Essential Oils**: Linalool, Caryophyllene, Sabinene
- **Flavonoids**: Quercetin, Kaempferol
- **Vitamins & Minerals**: Vitamin A, B, C, Iron, Calcium

Geographical source:

Native to **India and Sri Lanka**
Cultivated in **India, Thailand, Malaysia, Nigeria, China**

Cultivation:

- Grows well in **tropical and subtropical climates**
- Prefers **well-drained sandy or loamy soil**
- Requires **moderate sunlight and regular watering**
- Propagated by **seeds, cuttings, or root suckers**

Harvesting:

- **Leaves** harvested **throughout the year** for fresh use
- **Bark & Roots** collected for medicinal purposes
- Leaves are dried in **shade** to retain essential oils

Collection:

- **Leaves** harvested **throughout the year** for fresh use
- **Bark & Roots** collected for medicinal purposes - Leaves are dried in **shade** to retain essential oils

Microscopic characteristics

- **Leaf**: Anisocytic stomata, glandular trichomes present
- **Stem**: Circular with well-developed phloem and xylem
- **Vascular Bundles**: Collateral, surrounded by sclerenchymatous fibers

USES

- **Culinary**: Widely used in curries, chutneys, and spice blends for flavor and aroma
- **Medicinal**: Antidiabetic, antioxidant, digestive aid, liver protector
- **Hair Care**: Used in hair oils to prevent hair fall and premature graying
- **Traditional Remedies**: Used in Ayurveda to treat diarrhea, nausea, and skin infections

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Pudina

Synonym:

Pudina (Hindi), Japanese Mint, Field Mint, Wild Mint

Biological source:

Mint consists of the **leaves and essential oil** obtained from *Mentha arvensis*, *Mentha piperita* (Peppermint), and *Mentha spicata* (Spearmint), belonging to the **Lamiaceae** family.

Family:

Lamiaceae

Chemical constituent:

- **Essential Oils**: Menthol, Menthone, Limonene
- **Flavonoids**: Luteolin, Apigenin, Rutin
- **Tannins, Saponins**
- **Vitamins & Minerals**: Vitamin C, Iron, Calcium, Magnesium

Geographical source:

Native to **Europe, Asia, and North America**
Major producers: **India, China, USA, Brazil, Egypt**

Cultivation:

- Grows well in **temperate and subtropical climates**
- Prefers **moist, well-drained loamy soil**
- Requires **partial to full sunlight**
- Propagated by **root division, cuttings, or runners**

Harvesting:

- **Leaves** harvested **before flowering** for maximum oil content
- **Essential oil** extracted through **steam distillation**
- Leaves can be **air-dried or used fresh**

Collection:

- **Leaves** harvested **before flowering** for maximum oil content - **Essential oil** extracted through **steam distillation** - Leaves can be **air-dried or used fresh**

Microscopic characteristics

- **Leaf**: Diacytic stomata, glandular trichomes
- **Stem**: Quadrangular with well-developed vascular bundles
- **Vascular Bundles**: Collateral, surrounded by lignified fibers

USES

- **Culinary**: Used in chutneys, teas, salads, and cooling drinks
- **Medicinal**: Digestive aid, anti-inflammatory, antimicrobial, relieves nausea
- **Aromatherapy**: Used in essential oils for relaxation and stress relief
- **Cosmetic**: Used in skincare and oral care products (toothpaste, mouthwash)

Evaluated By:

Principal

Samarth Rural Educational Institute's
SAMARTH INSTITUTE OF PHARMACY
Approved by P.C.I. New Delhi, D.T.E. Mumbai, Govt. of Maharashtra &
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Jasswand

Synonym:

Jaswand (Marathi), Gurhal (Hindi), China Rose, Shoe Flower

Biological source:

Hibiscus consists of the **flowers, leaves, and roots** of *Hibiscus rosa-sinensis*, belonging to the **Malvaceae** family. It is widely used in Ayurveda and cosmetics.

Family:

Malvaceae

Chemical constituent:

- **Flavonoids**: Quercetin, Cyanidin
- **Anthocyanins**: Delphinidin, Malvidin
- **Mucilage, Tannins, Saponins**
- **Vitamins & Minerals**: Vitamin C, Calcium, Iron

Geographical source:

Native to **Asia and the Pacific Islands**
Major producers: **India, China, Malaysia, Sri Lanka, Thailand**

Cultivation:

- Grows well in **tropical and subtropical climates**
- Prefers **well-drained sandy or loamy soil**
- Requires **full sunlight and regular watering**
- Propagated by **stem cuttings or layering**

Harvesting:

- **Flowers** harvested **when fully bloomed** for medicinal and cosmetic use
- **Leaves & Roots** collected year-round
- Flowers are dried in **shade** to retain color and nutrients

Collection:

- **Flowers** harvested **when fully bloomed** for medicinal and cosmetic use
- **Leaves & Roots** collected year-round - Flowers are dried in **shade** to retain color and nutrients

Microscopic characteristics

- **Petals**: Thin-walled cells with pigmented epidermis
- **Leaf**: Anisocytic stomata, glandular trichomes
- **Stem**: Circular with well-developed xylem and phloem

USES

- **Hair Care**: Used in oils and shampoos for hair growth and preventing dandruff
- **Medicinal**: Antioxidant, anti-inflammatory, regulates blood pressure
- **Culinary**: Used in herbal teas, juices, and syrups
- **Cosmetic**: Used in skincare for anti-aging and moisturizing benefits

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