

## HERBAL INITIATIVE FOR YOUTH – BRIDGING THE OCEAN

Nature has been a source of medicinal agents for thousands of years, since healing with plants probably goes back to the evolution of Homo sapiens. Nowadays, apart from the pharmaceutical industry, medicinal and aromatic plants (MAPs) have become an important source of food and nutrition (food and feed additives) worldwide, in the production of cosmetics, mineral therapies and thermalism and in homeopathy.

MAPs are found in a wide variety of products on the market such as: plant extracts, traditional herbal medicines, homeopathic medicines, herbal teas, food supplements, spices and culinary herbs, fragrance ingredients and perfumes, cosmetics and body care products, food and beverages, food ingredients, aromas and essences, tinctures, etc.

The huge demand for MAPs gives rise to huge international trade, but the production and export of these species and final products to the EU from Costa Rica, Brazil and Jamaica is very limited.

The project's mission is to transfer the newly developed knowledge of the consortium of European Union countries (Slovakia, Hungary, Spain), consisting of NGOs working with youth, 2 universities, a technology centre and a research institute. And so introduce innovative teaching and training methods including open educational resources with 3 educational chapters: wild collection, cultivation and processing, and an on-line monitoring system within the herbal incubators in partner countries - Costa Rica, Brazil and Jamaica, for young people living in poverty.

Thus, the objective of the project is to increase the capacities of Costa Rican, Brazilian and Jamaican entities for education, training and quality in working with young people in the field of the collection, cultivation and processing of medicinal and aromatic plants.

## INTRODUCTION

**HerbAtlas** is a handbook of the most interesting and common aromatic and medicinal plants in Central America and the Caribbean, specifically in the countries of Costa Rica, Jamaica and Brazil.

This manual aims to provide specific descriptions, tips and tricks for cultivation and processing, and information on its medicinal properties and main uses.

### The information is structured as follows:

Scientific name  
Local name (English, Spanish, Portuguese)  
Botanical Description  
Habitat  
Culture  
Collection  
Transformation  
Main uses  
Medicinal properties

### The species described are as follows:

1. *Aloe vera*
2. *Baccharis trimera*
3. *Costus spicatus*
4. *Cymbopogon citratus*
5. *Hibiscus sabdariffa*
6. *Justicia pectoralis*
7. *Lippia alba*
8. *Maytenus aquifolium* / *Maytenus ilicifolia*
9. *Matricaria recutita* (*Chamomilla recutita*)
10. *Momordica charantia*
11. *Morinda citrifolia*
12. *Ocimum basilicum*
13. *Petiveria alliacea*
14. *Psidium guajava*
15. *Zingiber officinale*

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## IGUAL A TOTES LES FITXES:

**Scientific name:**

**Popular name:**

*English:*

*Spanish:*

*Portuguese:*

**CANVIAR A LES FOTOS:** Author

## Aloe vera

**Botanical description:** Aloe is a perennial succulent plant, with persistent roots, green leaves, hard and fleshy, with small side spines, and flowers appear in erect yellow terminal spikes. The true Aloe, in optimum climatic conditions, is in bloom for most of the year.

**Habitat:** Normally, it does not grow wild in Costa Rica, Jamaica or Brazil, but is grown in houses, home gardens or extensively. It grows in warm climates and requires very little water.

**Cultivation:** It prefers dry climate, temperature range of 18-40°C, rainfall of 400-2500 mm / year, relative humidity 65-85%, poor soil, sunny and well drained. It is propagated by root shoots, although it can be done by seeds with some difficulty. It does not require more care; it is advisable to fertilize. A commercial plantation can produce for 15-20 years.

**Harvesting:** The outer leaves are harvested by cutting close to the stem, washed and stored in refrigeration.

**Transformation:** The leaves are peeled and the pulp is separated. The preservation of the aloe gel is complex and requires acidifiants to lower the pH (citric acid) and preservatives in order to stabilize it.

**Main uses:** Aloe gel possesses digestive properties, and, above all, it is applied topically in cases of burns and skin problems.

**Medicinal properties:** The soft part of the inside of the leaves is very useful in skin conditions when applied externally thanks to its healing, anti-inflammatory, moisturizing, regenerating, softening, emollient and soothing properties. The gel is taken internally to improve the functioning of the digestive system. Also, the skin is rich in laxative principles used by the pharmaceutical industry (acibar).

## Baccharis trimera

- A. Stems 2-winged, leaves reduced to bracts, Small flower heads in lax spikes. Involvement of 3-4 mm of height by 4 mm of diameter, filariases greenish, obtuse. Gladiolan Achenes, 5-sided:: *B. articulata*
- AA. Stems 3-winged. Female involucre 5-9 mm high.
- B. Female involucre of 8-9 mm in height. Flower heads in spikes of glomeruli, straw brats in 3-4 series: *B. trímpera*.
- BB. Femenino involucre de 8-9 mm de altura. Flower heads in spikes of glomeruli. Flat or crested wings: *B. crispa*.

**Botanical description:** Dioecious shrub or subshrub, 40 to 50 cm high, trialled branches (wings up to 1 cm wide), leaves reduced to inconspicuous bracts. Flowers in small flower heads, in interrupted apical spikes; Male flower heads with hemispherical involvement of 4.5 mm high, with tubular flowers; Female flower heads with cylindrical envelopment 6 mm high, with filiform flowers. Fruit: achene glabrous, 10-side, white pappus.

**Habitat:** South of Brazil, Argentina, Paraguay and Uruguay. It is very common in the fields. It blooms from late Summer through early fall, and sometimes well into Winter.

**Cultivation:** It reproduces by seeds and cuttings. Implantation of seedling trays with space of 0.25 m between plants. It grows wild in fertile soils, therefore requires fertilizer and a certain humidity.

**Collection:** The aerial part is collected before flowering, leaving green parts at the bottom of the plant.

**Transformation:** Usually dried to prepare infusions, decoctions and tinctures.

**Main uses:** It is very bitter, widely used at the traditional level for digestive problems.

**Medicinal properties:** The aerial parts present phenolic compounds. Internally the aerial part infusion is used for stomach affections and liver problems.

## Costus spicatus

**Botanical description:** Native to Brazil. Erect herb, 1 to 2 meters with alternating large oval leaves. Flowers in spikes of red colour. Often in orchards.

**Habitat:** Some species are native to Central America and parts of South America. In Costa Rica can be found in areas with an adequate amount of moisture and shade. They can grow to heights of 1200 meters at sea level.

**Cultivation:** Reproduced by rhizomes. It needs sun and moisture.

**Collection:** Stems and leaves.

**Transformation:** Used fresh or dried in infusion or liquefied form

**Main uses:** It is a decorative and medicinal plant.

**Medicinal Properties:** Stems and fresh leaves dried or liquefied are used for the treatment of kidney diseases, kidney stones, cystitis, skin disorders or eye problems. It is diuretic and anti-inflammatory.

## Cymbopogon citratus

**Botanical description:** Perennial herb, foliar blades 1 m long by 5-15 mm, very aromatic and elongated as slats, rough, light green that sprout from the ground forming dense forests. The flowers are gathered in spikelets of 30-60 cm in length forming bunches.

**Habitat:** Native to India and South Asia, it grows wild in black and moist soils in tropical and subtropical climates.

**Cultivation:** Introduced plant that has become naturalized, so it grows wild, although it is customary to plant in family gardens and even at agroindustrial level, mainly for the production of essential oil. Demands sun, requires occasional strong rain (200-250 cm/year) or irrigation, hot tropical climate with temperature of 23-27°C and high relative humidity. It is propagated by stolons, seeds or root cuts. At the beginning the crop requires weeding, fertilization and rotation with legumes.

**Collection:** The leaves are collected young and dried in the shade for infusions.

**Transformation:** For use in cooking the tender leaves should be collected, get the lower part and used it fresh. The essential oil is obtained from the fresh or slightly dried plant.

**Main uses:** It is widely used in fresh Asian cuisine. Dry leaves are used in digestive infusions. Essential oil is used, above all, as a mosquito repellent.

**Medicinal properties:** Medicinal properties: Leaves and stems, used to treat gastrointestinal and respiratory conditions, are considered carminative, antiulcer and antispasmodic, as well as febrile, sweaty, analgesic, soothing, diuretic and expectorant, hepatoprotective, stimulant. Applied essential oil topically alleviates joint and muscle pain, as well as neuralgias.

## Hibiscus sabdariffa

**Botanical description:** There are several arable varieties. Shrub, 1-4 m high. Leaves 15 cm by 10 cm, spiral around the stem, ovate, from sharp to acuminate at the tip, serrated margins. Solitary flowers, red, on long peduncles, in the armpits of the upper leaves, epicalyx of 5-7 bracteolae about 1 cm long, cup-shaped calyx 2.5 cm long, and corolla of short duration.

**Habitat:** Its origin is not clear, Asia or tropical Africa, naturalized as weeds in tropical America, is cultivated in large areas of dry subtropical zones, Egypt, Senegal, Sudan, Central America, South America, China, Thailand and India. It grows in dry forest and subtropical thorn bush, warm climate, humid terrain (200- 450 cc/year).

**Cultivation:** It requires sandy-clay soil rich in organic matter. It resists drought, adaptable to dry places. It is propagated by seeds; they are sown in boxes or trays.

**Collection:** The fleshy red calyx is collected. It is rich in malic acid and anthocyanins from November to early February. Another more fibrous variety is grown to obtain fibre. It is used as substitute of the jute to make burlap; the stem is cut to 30 cm of the ground.

**Transformation:** The calyx is usually dried.

**Main uses:** Fibre is obtained from the stem. The calyx is medicinal and widely used in food to prepare sweet brine, jellies, sweets, syrups, liqueurs, jams (fresh calyces), soft drinks (karkadé) and as dyes. The tender leaves are eaten like spinach with rice, and from the seeds a vegetable oil is obtained, and at the same they can be roasted and be food for birds.

**Medicinal properties:** the calyces are taken as an infusion to treat gastrointestinal, respiratory, diuretic, antihypertensive, antiparasitic and lightly laxative conditions.

## Justicia pectoralis

**Botanical description:** Herbaceous perennial plant, of thin branches, of half a meter until 2 m of height, sometimes rooted in the knots. Opposite sheets, 3-10 cm by 5-30 mm, linear to lanceolate, aromatic to touch. Terminal inflorescence in loose panicle; Flowers 7-8 mm long, pink with white markings; the fruit is a capsule with elastic dehiscence.

**Habitat:** Native to all tropical America (continental and insular). Widely cultivated.

**Cultivation:** There are several arable varieties. It is propagated by stems cuttings, which must contain about 45 knots; plant preferably in Spring, direct sun or partial shade. It requires constant moisture, but not excessive. *Justicia pectoralis* var. *stenophylla* is considered hallucinogenic.

**Collection:** The leaves are collected by taking the ends of the branches with 2-3 knots (may include flowers). If it is consumed fresh, it is better to wash the leaves before preparing the infusion or to dry in ventilated place in the shade or with artificial heat (not more than 40 °C).

**Transformation:** The leaves are used fresh or dried to prepare an infusion, decoction, tincture or fluid extract.

**Main uses:** The leaves are used in traditional medicine for the treatment of cuts (leaf juice or topical infusion), bronchial catarrh (inhalations) and nervous conditions (oral).

**Medicinal properties:** Coumarin and umbelliferone are considered to be responsible for analgesic and anti-inflammatory activity. It is considered to be sedative. The leaf is used for stomach pain of nervous origin by the relaxing effect of the smooth muscles. In addition, it is used for headaches, nervous diseases, insomnia, prostate problems, muscle and menstrual pains, colds, coughs, bronchitis, fever (infusion bath), wounds, oral thrush and ulcers, because it is disinfectant and healing. It should not be used in conjunction with anticoagulants or in patients with circulatory disorders.

## Lippia alba

**Botanical description:** Very branched shrub that can grow up to 1.5 meters, has green, serrated and opposite leaves, ovate or oblong, rough on the upper side, 2 to 3 cm long. Its small flowers are a combination of light purple and white colours, forming inflorescences of 2 cm in length. The stem is dark brown. Dry fruit with membranous exocarp is separated into 2 walnuts.

**Habitat:** Native to Central and South America, it grows on slopes, along the roads and river banks of heights up to 1800 m. Very cultivated for its medicinal properties.

**Cultivation:** It requires well drained soil, half shade or sun in any type of soil; the propagation is usually made by hardwood cuttings that root easily, by underground layers or by seed.

**Collection:** Leaves are obtained by wild collection in the fields or by some domestic seeding in home gardens.

**Transformation:** To prepare the decoctions that are applied in the affected areas the leaves are desiccated.

**Main uses:** The leaves are used topically on the skin and mucous membranes because of their antifungal and antibacterial properties. It is added as a condiment to certain dishes (*molle*) and it has shown positive effects on dandruff and seborrheic dermatitis of the scalp. But it is much appreciated as ornamental in gardens.

**Medicinal properties:** With relaxing effect of the smooth muscles. With analgesic, colagogue, emmenagogue, sedative, diaphoretic and expectorant action. With sudorific and febrifuge properties in colds, also antispasmodic and digestive (carminative). It is used to treat liver cramps, arthritis pains, or rheumatism.

**Maytenus aquifolium**  
**Maytenus ilicifolia**

**Botanical description:** It is a perennial, dioecious shrub, 5 to 10 meters high, with alternating coriaceous leaves, petioles 1.5-5 cm long, spiny dentate margins (2-7 pairs), bright green beam and underside something paler. Inflorescences arranged in yellowish axillary fascicles or solitary, reddish bracts. Small flowers, reddish sepals; Yellowish petals. The fruit is an ovoid or ellipsoidal capsule, reddish, bivalve, 1 cm long, with 1-4 reddish seeds inside. Blooms in Spring and fructifies in Summer.

**Habitat:** Native of southern Brazil, Paraguay, Bolivia, Uruguay and north-eastern Argentina

**Cultivation:** The most common form of multiplication is by seed, germinates better between 20-30°C, stored in cold rooms (5°C and 85% relative humidity). Seedling formation is slow (4-5 months), and the better time for transplanting to the field is during Spring and Summer, while fertilization varies according to the degree of development. A density of 4,000 plants/ha is recommended, with a distance of 1 meter in the row and 2.5 meters between them. The spacing between rows can vary (2-3 meters) depending on the separation between machines wheels. It requires frequent irrigation in its initial phase until the first 2 years. Then irrigation is applied as needed. It can be grown in full sun.

**Collection:** With annual pruning. The first pruning is done at 50 cm in height. Subsequent pruning should respect the height of the ramifications of the plant. The cut is made manually with pruning shears. It is considered that the plant needs 2 years to recover the amount of leaves of its branches. Thus the alternating cropping system in each half of the plant provides annual crops. As regard the expected return, in a 4 years old crop, 0.67 tons of dry leaves/ha and year are obtained, cutting only 1/3 of the leaves of the plants according to a study.

**Transformation:** Leaves have low humidity, about 50% in the state of the crop. The drying is carried out in a dryer with air heated by a gas burner, regulated for a maximum temperature of 40°C. After drying, the leaves and branches are separated manually.

**Main uses:** Medicinal with antiulcer and antimicrobial activity.

**Medicinal properties:** Its applications in the treatment of gastritis, dyspepsia and gastroduodenal ulcers are perhaps the most recognized.

## Matricaria recutita

**Botanical description:** It is an annual herb of 15 to 60 cm in height, with leaves finely divided into linear, acute segments. Its flowers are arranged in inflorescences called flower heads, long pedunculate, with the central part of intense yellow colour and hollow and white petals of the ligulae in the periphery. The flowers are tubular and yellow. Its fruit is an achene with tiny seeds.

**Habitat:** Native to Mediterranean Europe, it grows in populated areas along roadsides, roads, modified soils and, as weeds, on farmland. It blooms from late Winter to late Spring.

**Cultivation:** Requires lots of sunlight and water, particularly for flowering and production of essential oil. It is propagated by seed in nurseries, the time of sowing is at the end of Winter. The seedlings are transplanted after 10 weeks leaving a space of 20 cm between seedlings. The plant develops its life cycle in approximately 6 months. It is recommended to fertilize organically with 20-25 ton/ha before sowing. It tolerates almost all soils, but prefers slightly sandy soil. Maintain soil moisture until the beginning of flowering.

**Collection:** The flowers are harvested when they are open, but at the beginning of flowering. It is done manually, with combs or mechanically with harvesters.

**Transformation:** Dried, whole or crushed flower heads are used for infusion bags, fluid extracts and tinctures, and the essential oil is obtained by distillation, oral and topical.

**Main uses:** It is used after the meal as an infusion of the floral chapters as digestive for stomach aches, gas and stomach cramps. Chamomile essential oil is used in liqueurs, perfumes, shampoos, soaps, lotions, creams and aromatherapy.

**Medicinal properties:** In addition to its digestive use and for irritable bowel syndrome, it is considered anti-inflammatory and disinfectant of skin and mucous membranes, and nervous sedative. The flower heads in large doses could be emetic. Preparations containing chamomile essential oil can cause allergic skin reactions and/or rhinitis. Do not administer orally in the first 4 months of pregnancy.

## Momordica charantia

**Botanical description:** Annual, dioecious, climbing plant, 3-4 m long. Simple leaves, 4-12 cm in diameter, 5-6 lobes, and ribs (three to seven) well marked. Yellow corolla, lobes of 1.5-2.0 cm. Fruit oblong-elongated, orange-yellow, 5-15 cm long, has warts, it opens in 3 parts showing large seeds of 10-16 mm, red pulp and sweets.

**Habitat:** Of Asian origin, this tropical or subtropical species, is widely cultivated for its rather bitter edible fruit. It grows wild in humid hot regions of the lowlands in areas with debris and abandoned lands up to 1000m in height.

**Cultivation:** Numerous cultivable varieties are known that differ in the form and bitterness of the fruit. It requires full sun, not susceptible to pests, rainfall 500-1100mm/year and it does not have higher nutritional requirements. Propagation is by seeds, which are sown 3 per hole, germination will occur in about 5 or 6 days. After 20 days, sticks can be added to hold the climbing plant. At 40 to 50 days starts flowering, and the fruit is well developed in 10 days after pollination.

**Collection:** Fruits are picked and sold green in markets. To use the seeds, the fruits are cut ripe. The leaves are cut at the end of the rains.

**Transformation:** The fruits are consumed fresh. The leaves are dried in the shade.

**Main uses:** Main uses: Medicinally it is used as antidiabetic, antiparasitic, emmenagogue, anthelmintic, antimycotic, antirheumatic, antihypertensive, carminative, choleric, antipyretic and antifatulent. The leaves were used to lighten clothes. Infusion baths were used to facilitate delivery and to reduce fevers. The fruits are eaten green, raw or cooked. The flesh is crunchy and watery in texture, quite similar to cucumber. One way to reduce bitterness when they are ripe is to salt them and then wash them before consumption. The red seeds are edible, are used as an ingredient for salads. They are cooked and then scrambled with vegetables, meat or eggs, or in soups, fried in oil, then filled with spicy ingredients, or cooked in coconut milk, or smoked.

**Medicinal properties:** It has been used in traditional medicine as a syrup against fever and malaria. The cooking of the fruits is used as an emetic. Mature fruits are used in the treatment of peptic ulcer and externally in the healing of wounds, applied as a poultice. The infusion of ripe fruits cures haemorrhoids. Recent research has shown that immature fruits have antitumor and hypoglycemic properties, as well as antiseptic, antiviral and for treatment of malaria.

## **Morinda citrifolia**

**Botanical description:** Small evergreen tree up to 9 m in height. Elliptic, large, simple, bright leaves, with well-marked veins. It gives flowers and fruits all year round. The fruit, multiple, of ovoid shape, with an irregular surface of yellowish or whitish colour. Contains many seeds. When it ripens, it has a bad taste and smell.

**Habitat:** Native of Asia, grows in a wide variety of habitats because it can withstand different conditions. It is found in the wild in various environments, dense forest, volcanic terrain, near the sea, on sandy soil or on rocks.

**Cultivation:** Germinates in seedlings with good humidity and a temperature higher than 28°C. The transplant is performed once the plant has a maximum of 4-6 leaves. It needs tropical temperate climates, below 300 m, tolerates salinity, drought, high temperature (more than 38 °C) and few floods, in deep soils with good drainage, but also on rocks. It can grow in full sun or full shade. It gives 4 to 8 kg of fruit per month.

**Collection:** The fruit is harvested when it takes a whitish coloration, meaning that it is ripe.

**Transformation:** The fresh fruit is sold in local markets, although there are some producers who market it in different ways, in the form of juice, and powder for use in supplements.

**Main uses:** The fruit is eaten fresh as a salad ingredient or cooked. The leaves are used as vegetables. The seeds are eaten toast. From the root and the bark are extracted dyes of red, purple and yellow. With the fruit a shampoo for lice is prepared. The traditional medicinal uses of many countries use all the parts: flowers, bark, roots and especially, the fruit to treat numerous health problems, including thrush, rheumatism, intestinal worms, fevers, skin infections, respiratory congestion, bone fractures, and boils. A plaster with the leaves is used for coughing, and the juice of the leaves is applied topically for arthritis. The roots have been used to treat abdominal pain, impotence, and menstrual disorders.

**Medicinal properties:** Nowadays is marketed as a dietary supplement, since it is considered to stabilize the function of the pancreas, liver, kidneys, bladder, female reproductive system, improving diabetes or hypoglycemia, cholesterol, menstrual cramps, high or low blood pressure, gout, arthritis, etc. Several investigations carried out in recent years indicate its use as antioxidant, anthelmintic, antitumor, antiseptic, analgesic or sedative.

## Ocimum basilicum

**Botanical description:** Annual grass 30-60 cm high. Elliptic, oval or sub-rhomboidal leaves, 2-4 cm by 1-2 cm, sharp point, narrow base, slightly jagged margins, glabrous, except in the veins; Verticillate inflorescences, 20 cm long; Corolla white to mauve, 4-5 mm long.

**Habitat:** Native to Asia, it is cultivated throughout the tropical world, do not like frost.

**Cultivation:** There are numerous cultivable varieties. It reproduces by seeds that take 6-10 days to germinate. It can be sown throughout the year. Requires medium rich soil, with good drainage and slightly dry. It develops well in full sun, with sufficient rain or irrigation. It can be grown in orchards or family plots and also on pots. It needs fertile soil.

**Collection:** The leaves are obtained by manual collection. They require a cut of the ends of the branches before they bloom, leaving leaves at the bottom. We can use the flowers at the culinary level, cutting them in a way that favours the growth of the plant.

**Transformation:** The leaves are eaten fresh, or in sauces. Essential oil is distilled from the whole plant. The leaves are dried, cooled or frozen.

**Main uses:** Fresh, dry leaves are used to season meals and salads. The smell of the fresh leaves is repellent for larvae of insects and mosquitoes. It has medicinal, agricultural, aromatic, ornamental and cosmetic use.

**Medicinal properties:** The leaves have antispasmodic digestive properties. Fresh leaf is used for stomach pain, drinking a cup three times a day, and for abdominal pain and flatulence. Essential oil is not recommended orally.

## **Petiveria alliacea**

**Botanical description:** Perennial grass 50-120 cm high, with an intense aroma of garlic when rubbed. Leaves arranged in spiral, simple, whole, oblong to elliptic, from sharp to acuminate at the tip, 15 cm by 5 cm, usually glabrous. Flowers in terminal clusters up to 35 cm long with tiny hairs; white perianth divided into 4 segments, becoming green when mature. Fruit in elongated achene and cuneiform of 6-8 mm long.

**Habitat:** Native to tropical America, it grows everywhere, grown and naturalized in tropical regions. It lives in barren and cultivated lands, low or medium regions, humid (700-1200 mm/year), warm climate, more or less shaded.

**Cultivation:** It is recommended to domesticate it and produce it by cultivation. It propagates by cutting or seed. Cuttings are sown in a mixture of black soil and white sand (young stems of 3-6 buds). It should be watered frequently.

**Collection:** The leaves of wild plants or crops are harvested. The root is also harvested.

**Transformation:** The leaves are dried in the shade.

**Main uses:** The main uses are oral and topical medicines. The incense of leaves is used to drive away mosquitoes. The fresh leaf is used to train tracking dogs.

**Medicinal properties:** The leaves are considered antispasmodic, anthelmintic, anti-inflammatory, diuretic or abortive. The decoction of the leaves is used to treat gastrointestinal conditions, such as diarrhea and flatulence; respiratory conditions such as tonsillitis, asthma, bronchitis, cold; nerve disorders, cramps and diabetes. Topically, by means of compresses and cataplasms of the leaves decoction, it is used to cure ulcers and dermal infections, herpes, abscesses, grains, eruptions and boils. The crushed fresh leaf is inhaled to treat headache and sinusitis, and helps to repel insects and lice in children and pets. Chewed fresh leaf is used for toothache. The tincture is used in the form of frictions for rheumatic pains. Root decoction, orally, is used to relieve asthma, catarrh, cystitis, dysmenorrhea, fever,... Scientific studies on the antitumor properties of extracts of this plant are currently underway.

## Psidium guajava

**Botanical description:** Small tree, 8 m high, sparsely branched, trunk of 25 cm diameter, thin bark, red-brown, it produces falling scales. Aromatic, green and opposite leaves with short petioles, elliptic or oblong, 5-10 cm long, round at the apex and at the base, with prominent nerves on the underside, provided with glands. Axillary, white flowers, 3 cm wide, numerous stamens. Fleshy fruit of variable shape and size, it depends on the cultivation.

**Habitat:** Native to Tropical America, naturalized in the tropics up to 1500 m, is found in pastures and forests. Cultivated for production level, frequent in yards.

**Cultivation:** It adapts to a great variety of climates, from tropical humid to Mediterranean, needs 1000 mm/year of rain. Propagation is preferably carried out by rootstock cuttings, top graft cuttings, nursery cuttings, rooted cuttings and rooted grafts. It is preferable to use fertile, well drained soils and pH between 4.5-8.2. It tolerates a certain degree of salinity and resists prolonged flooding. Plant between May-September at distances of 6x3; 5x5 or 8x4 m. The fruits ripen three months and a half after flowering. Prune every year after the collection of the fruits (October-January).

**Collection:** Healthy leaves are collected early in the morning at the end of the rainy season and dried in the shade. The fruits are harvested when ripe. The root is also used, but less often.

**Transformation:** Leaves and root are dried in the shade, although the leaves are recommended to use them preferably fresh by decoction. With the fruits we can make jams, jellies, juices or ice creams.

**Main uses:** The bark is used to tan skins and dye silk and cotton. The wood is hard and resistant, useful to build tools, to smoke meat. It's good fuel. Edible fruits are richer in vitamin C than citrus fruits. With the fruit and leaves an astringent drink is prepared. Leaves have medicinal use against diarrhea.

**Medicinal properties:** The fruits are used against scurvy and intestinal parasites, and relieve respiratory congestion. Astringent, febrile and anti-inflammatory properties are attributed to it. Leaves, bark and root decoction are used orally to treat diarrhea; in gargles, baths and washes for inflammations and ulcers of the mouth, throat or skin; Including diabetes, hypertension, pain and rheumatism. Root decoction is used to treat dropsy. Antibacterial, antiemetic, anti-inflammatory, anthelmintic, antiseptic, astringent, carminative and antispasmodic properties are attributed to leaves and bark.

## Zingiber officinale

**Botanical description:** herb of 30-100 cm height, with fleshy aromatic and spicy rhizome. The linear-lanceolate leaves of 20 cm by 1-3 cm, disappear from November to April; Cylindrical inflorescence; Fruit in three valves capsule with small black seeds.

**Habitat:** Native to tropical Asia, cultivated in tropical and subtropical regions.

**Cultivation:** Numerous cultivable varieties can be found. It requires moist fertile soils with good drainage, partial shade or filtered sun. It can grow under trees or shrubs. It reproduces by fragments of the rhizomes between March and May (at the beginning of the rains).

**Collection:** Remove the plant from the ground at the end of the vegetative period, in Winter, after the leaves wither. Blanch or wash and rub to prevent sprouting, and keep in a ventilated place in the shade.

**Transformation:** The fresh or dried rhizome (preferably with artificial heat 45°C) is used. Crushed in small fragments for decoctions and tinctures. It is also sprayed for use as a seasoning. Syrups and wines with medicinal applications are prepared.

**Main uses:** The rhizomes are consumed fresh, canned, pickled or caramelized, in refreshing and alcoholic drinks, smoothies, beer, to aromatize biscuits and gingerbread. The dried rhizome powder and its essential oil are used as flavorings in food and beverages. It is the first choice in cases of vomiting and dizziness due to pregnancy or travel.

**Medicinal properties:** The decoction of rhizome is used to treat digestive conditions such as colic, diarrhea, indigestion, nausea and gas and in respiratory conditions in cases of cough, tonsillitis, bronchitis, cold. In case of malaria, gout and dysmenorrhea it has also been used at the traditional level. The oily or alcoholic maceration of the crushed rhizome is used for antirheumatic frictions.

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