REFERENCES

GUAVA
Psidium guajava

Ticzon, Romeo: Ticzon Herbal Medicine Encyclopaedia. 1997. Romeo R. Ticzon Publishing, Philippines. ISBN No. 97191-7231-2.

GUAVA
Psidium guajava
Family: Myrtaceae

Common names: Common guava, yellow guava, apple guava
Tagalog: Bayabas, kalimbahin, tayabas, guayabas.
Bisayan: Bayabas
llokano: Bayabas, guayabas.

Description: Guava is a tropical and semitropical plant. It is well known in the islands for its edible fruit. It is common in the backyards. The branches are crooked, bringing opposite leaves. The flowers are white, incurved petals, 2 or 3 in the leaf axils. The fruit is small, 3 to 6 cm long, pear-shaped, reddish-yellow when ripe.

Medicinal use; The leaves of the guava tree in decoction are recommended for gastrointeritis, uterine hemorrhage, chronic diarrhea, swollen legs, etc The young leaves and shoots are used for dysentery, inflammation of the kidney, and diarrhea. The same decoction is good as a wash for ulcers, vaginal and uterine problems, and where an astringent remedy is needed. It heals wounds and cuts. It has been used for spasms, fevers, worms, kidney problems, epilepsy, diabetes and even for cerebral affections.

Parts used: The whole plant.

Dose: 30 to 60 grams for 1 litre of water. 4 to 5 cups a day

In Gardens of Hawaii, a photocopy received. A low evergreen tree or shrub 6 to 25 feet high, with wide-spreading branches and square, downy twigs, is a native of tropical America. It is a common vegetation cover by roads and in waste places in Hawaii, and in some districts it is a pest. The flowers are fragrant, white with four to six petals and yellow anthers.

The outside of the fruit resembles a lemon in shape, size and colour, though some fruits are brownish-yellow. Don Marin introduced the Guava to Hawaai, where jelly, jam and juice are prepared from it on a commercial scale. Lately, it has been found that guavas, raw or cooked, are valuable food, as they contain iron, calcium and phosphorus, and are about equal in vitamin C content to oranges, which is not decreased by cooking. There are a few varieties: the lemon guava, with sour pink pulp, is called kuawalemi; a kind with bigger seeds, sweet, pink pulp, and thicker skin, is called kuawa-momona; one with whitish pulp, but otherwise like the lemon guava, is called kuawa-ke'oke'o.

From leaf buds, the Hawaiins make a medicinal tea, which has an astringent effect.

In addition, there is the Purple Strawberry Guava, Cattley Guava, Waiawi 'ula'ula, which is

Psidium cattleianum. synonym, *P.littorale*. Flowrers and fruits resemble those of the common guava. The fruit is purplich red, which contains a white pulp, which is eaten raw or made into jam or jelly and which tastes somewhat like strawberries.

The yellow strawberry guava, yellow Cattley guava, waiawi (*P.cattleianum* f. *lucidium*) is a handsome, resembling the waiawi'ula'ula in many ways but bearing larger, yellow fruit.

Hernandez, Dolores F.: Plants of the Philippines. M&L Licudine Enterprises. First Printing 1971. 2nd. edition 1980. Printed in the Philippines. University of the Philippines: Chairman: Consuelo V. Asis. D. No ISBN number.

Refers to Bayabas as Guava or *Psidium guajava* Linn. It has the common names Bayabas, guayabas, tayabas, kalimbahin (Tag.); bayabas (Ilk., Bis., Ibn.); bagabas (Ig.); biabas (Sul.); bayaya (Bik.); gaiyabat, gaiyabit (If.); gayabas (Bon.).

Bayabas is a small tree which grows well in various soil types. It is common in backyards. The somewhat hairy young branches are 4-angled with opposite leaves. The flowers, with incurved petals, are cottony white, coming out in two's or three's in the leaf axils. The numerous stamens form the attractive part of the flower. The inferior ovaries develop into roundish green fruits which turn yellow on ripening and have edible, aromatic seedy pulp. Propogation is by seeds and also by budding, grafting and marcotting. Root cutting have also been tried with success.

The fruit is rich in vitamin C, and is eaten raw, candied, or made into jellies and jams. The leaves are rich in tannin, and have antiseptic properties.

Zakaria, Muhamad bin & Mohd, Mustafa Ali: Traditional Malay Medicinal Plants. 1994. Penerbit Fajar Bakti Sdn. Bhd. Photocopy. ISBN No. 967-65-2476-X

Zakaria refers to *Psidium guajava* Linn. (Fam: Myrtaceae). Local names: Jambu burung, Jambu padang, Jambu berasu, Jambu bereksa, Jambu buyawas, Jambu melukut, Jambu Portugal, Jambu batu, Jambu pelawas, Jambu biji, Jambu biyawas.

The leaves and stems are used.

Traditional use: To cure stomach ache, drink water boiled with the leaves and shoots. It also helps to stop purging.

Scientific study: The fruit contain saponine combined with oleanolic acid. The leavs contain essential oil with the main components being *alpha*-pinene, *beta*-pinene, limonene, menthol, terpenyl acetate, isopropyl alcohol, longicycleye, caryophyllene, *beta*-bisabolene, caryophyllene oxide, *beta*-copanene, farnesene, humulene, selinene, cardinene and curcumene.

Iwu, Maurice M.: Handbook of African Medicinal Plants. CRC Press. 1993. ISBNNo.0-8493-4266-X.

Iwu refers to *Psidium guajava* L. (Myrtaceae) as Guava.

African names: Hausa: gwaabaa
Efik: woba

Igbo: ugwoba
Yoruba: guafa

Medicinal uses: The fruits areedible and the juice is used as a refreshing drink. The major ethnotherapeutic use of the plant is in malaria; for this purpose, its leaves are used as an ingredient in the preparation of fever "teas". The leaves are also used as part of the pot herb used in steam treatment for malaria. A weak infusion of the leaves and tender branches is dispensed for diarrhoea and as a tonic iin psychiatry.

Constituents: The fruits are rich in vitamins (A and C), iron, calcium and phosphorus. The essential oil from the leaves has been shown to contain caryophyllene, nerolidiol, *beta*-bisabolene and *beta*-sitosterol, ursolic, oleanolic, crategolic, and guayavolic acids. The plant also contains leukocyanidins, sterols, and gallic acid in the roots.

Pharmacological studies: The aqueous alcohol extract has been shown to exhibit sedative activity. Oral doses of 188.5, 377, and 1131 mg/kg caused a significant dose-dependent decrease of motor activity for 90 min after the administration of the extract. In rats, the plant significantly decreased, in a dose-dependent manner, the intestinal transit time. It also showed *in vitro* antimicrobial activity against *Escherichia coli, Salmonella typhi, Staphylococcus aureus, Proteus mirabilis,* and *Shigella dysenteria.*

Quisumbing, Eduardo: Medicinal Plants of the Philippines. Katha Publishing Company. JMC PRESS, Quezon City, Philippines. 1978. ISBN No. unknown.

Psidium guajava
Psidium cujavus
Psidium pomiferum
Psidium aromaticum

Local names: *Bagabas* (Ig); *bayabas* (Ibn., Ilk., Tag., C. Bis.), *bayaua* (Bik.); *bayabo* (Ibn.); *biabas* (Sul.); *gaiyabat* (If.); *gaiyabit* (If.); *getabas* (Bon.); *guayabas* (Tag.); *guyabas* (Ilk.); *kalimbahin* (Tag.); *tayabas* (Tag.); *guava* (Eng).

Bayabas is found throughout the Philippines in all islands and provinces and is usually very common in thickets and secondary forests at low altitudes, ascending to at least 1,500 meters. It was introduced from tropical America and has become thoroughly naturalised.

Bayabas is one of the commonest and best known fruits in the Philippines. A wild tree, it grows abundantly in settled areas. The fruit is a favourite with the Filipinos and is extensively used in the manufacture of jellies owing to the presence of a considerable amount of pectin. The ripe fruit is eaten as a vegetable and used as a seasoning for ‘sinigang’ etc.

Wehmer records that the leaves contain fixed oil 6%, and volatile oil 0.365%. The essential oil contains eugenol, mallic acid and tannin from 8-15%. The fruit contains ‘glykosen’ 4.14-4.3%, saccharose 1.62-3.4%, protein 0.3%,etc.; and the ash yields 75% of $CaCO_3$. The bark contains 12-30% of tannin. The roots are also rich in tannin.

The roots are official in the Mexican Pharmacopoeia; and the leaves in the Dutch and Mexican Pharmacopoeias.

In the Philippines the astringent, unripe fruit, the leaves, the cortex of the bark and roots – though more often the leaves only – in the form of a decoction, are used for washing ulcers and wounds. Guerreru states that the bark and leaves are astringent, vulnerary, and when decocted antidiarrhetic.

Sanyal and Ghose report that internally the bark is used in the chronic diarrhoea of children and sometimes adults; half an ounce of the bark is boiled down with six ounces of water to 3 ounces; the dose (for children) is one teaspoonful 3 or 4 timre a day. Dey says that the root bark has been recommended for chronic diarrhoea. In a decoction of half ounce in 6oz water, boiled down to 3 oz and given in teaspoonful doses; and also recommended as a local application in prolapsus and of children. Nadkarni states that a decoction of the root-bark is recommended as a mouthwash for swollen gums.

Kirtikar and Basu say that the leaves when chewed, are said to be a remedy for toothache. Martinez states that the decocted leaves are used in Mexico for cleansing ulcers. Nadkarni reports that the ground leaves make an excellent poultice. Dymock, Warden, and Hooper quote Descourttilz who places this plant among the aromatic antispasmodics; a decoction of the young leaves and shoots is prescribed in the West Indies for febrifuge and antispasmodic baths, and an infusion of the leaves for cerebral affections, nephritis, and cachexia; the pounded leaves are applied locally for rheumatism; an extract is used and an extract is used for epilepsy and chorea; and the tincture is rubbed into the spine of children suffering from convulsions. Dymock, Warden and Hooper and Rodriguez mention that the leaves have also been used successfully as an astringent in diarrhoea. Standley states that in Mexico the said to be a remedy for itches. Rodriguez writes that in Uruguay, a decoction of the leaves is used as a vaginal and uterine wash, especially in leucorrhoea.

In Costa Rica, according to Pittier, a decoction of the flower buds is considered an effective remedy for diarrhoea and flow of blood. Sanyal and Ghose report that the fruit is astringent and has a tendency to cause constipation. Martinez states that guava jelly is tonic to the heart and good for constipation. The ripe fruit is a good aperient, and should be eaten with the skin, for without it, costiveness results. The unripe fruit is said to indigestible, causing vomiting and feverishness, but it is sometimes employed for diarrhoea. Water in which the fruit is soaked is good for diabetes.

Nadkarni, K.M., **Nadkarni**, A.K.: Indian Materia Medica - with Ayurvedic, Unani-Tibbi, Siddha, Allopathic, Homeopathic, Naturopathic and Home remedies. Vol.1. 1999. Popular Prakashan Private Ltd., Bombay, India. ISBN No. 81-7154-142-9.

Psidium guyava
Myrtaceae

Sans: Perala; Amratafalam; Amruta-phalam. *Eng*: Guava. *Hind*: Lal sufrium (red); Amrut. *Ben*: Lal peyara (red); Goachi-phal; Peyara; Pyara; Piyra. *Bom*: Perala. *Tel*: Jama; Jam-pandu; Goya-pandu. *Tam*: Koyapalam; Koyya; Goyya-pazham (Segapu). *Mal*: Palamper. *Can*: Perala-hannu. Jama-phala; Shebe-hannu. *Kon*: Paera. *Sind*: Zetton; jamphal. *Mah*: Peru; Jamba. *Guj*: Jamrukh. *Assam*: Madhuria. *Nepal*: Amuk. *Arab & Pers*: Amrud. *Punj*: Amrut. *Burm*: Malakabeng.

Habitat: This tree is cultivated nearly all over India and is common in Burma.

Varieties: *Khasi* (seedless); *Vanga* (elongate); and *Gedi* are the three grown in Sind.

Parts used: Bark, fruit and leaves.

Constituents: Bark contains tannin 27.4%, resin and crystals of calcium oxalate. There is a high percentage of carbohydrates and salts. Leaves contain resin, fat, cellulose, tannin, volatile oil, chlorophyll and mineral salts. Root, stem-bark and leaves contain a large percentage of tannic acid. Fat dissolves completely in chloroform, partially in ether or alcohol. Greeninsh volatile oil (essential oil) contains eugenoil and dissolves in chloroform, ether or alcohol. Calcium and manganese are present in the plant in combination with phosphoric, oxalic and malic acids.

Action: Stem, bark and root-bark are astringent. Unripe fruit is indigestible, causes vomiting and feverishness. Bark is astringent, febrifuge, antiseptic. Fruit is laxative, leaves are astringent.

Uses: This tree is much appreciated on account of its pleasant fruit which is largely ewaten; but its seeds are injurious. Fruit forms, when stewed, the well-known guava jelly or preserve. Jelly is tonic to the heart and good for constipation. Ripe fruit is a good aperient. Raw fruit is also sometimes eaten. It should be eaten together with the rind; if eaten without the rind it causes costiveness. Unripe fruit is employed in diarrhoea. Fruits are recommended by Garrod for gout. Water in which the fruit is soaked is good for thirst in diabetes. Root-bark is successfully employed in chronic infantile diarrhoea in the form of a concentrated decoction (1 in 12), or 2 oz of the bark in a pint of water boiled down to half a pint. Dose is 1 drachm or 1-2 teaspoons two or three times daily. It is administered in cholera for arresting vomiting and diarrhoeic symptoms (especially those of the red variety). Locally, decoction of the leaves is applied with much benefit to the prolapsus ani of children; is employed in scurvy and for unhealthy ulcers, and is an efficacious gargle for swollen gum and ulceration of the mouth. Leaves when ground make an excellent poultice.

Oliver-Bever, Bep: Medicinal Plants in tropical West Africa. Cambridge University Press, Cambridge. 1986. ISBN No. 0-521-26815-X.

Myrtaceae: *Psidium guajava* or guava

The fruits are used locally as an antidiarrhoeal.

Leaves contain an essential oil rich in cineol, tannins, four triterpenic acids and ursolic acid and oleanolic acids. In addition three flavonoids have been isolated from the leaves; quercetin, its 3-L-4-4-arabinofuranoside (avicularin) and its 3-L-4-pyranoside with strong antibacterial action.

Nickel reported the strong antimicroibial action of guava leaves on Gram-positive and Gram-negative organisms. Malcom and Sofowora confirmed the antibacterial action on Gram-positive and Gram-negative organisms (*Sarcina lutea* and *Staphylococcus aureus*) and also noted action on *Mycobacterium phlei* by Nigerian plants. The flavone derivatives isolated by

Khadem and Mohammed were reported to inhibit the growth of *Staph. Aureus* in a dilution of 1:10,000.

Burkill, H.M.: The useful plants of West Tropical Africa. Edition 2. Vol. 4. Families M-R. Royal Botanic Gardens Kew. 1997. ISBN No.1-900347-13-X.

Local names are given in the text.

The bark contains tannin, as much as 30% content being recorded, and various polyphenols. A black dye is made from it in E. Africa for dyeing matting, silk and cotton. It is used in Gabon for tanning hides. A tisane of the bark (and of the leaves) is taken in Congo against diarrhoea.

The leaves are scented and contains 6% of a fixed oil, 0.365% of a cineol-based essence, 3.15% resin, 8.5% tannin, and a number of other fixed substances. In Ghana and in Nigeria they are chewed to relieve toothache, and boiled with lemon grass (*Cymbopogon citratus*) the decoction is drunk for coughs. A decoction is also taken in Senegal for tracheobronchitis. A leaf infusion is taken in Ghana and Nigeria for stomach complaints e.g. constipation, and in Adamawa with “red” potash for dysentery; a decoction is taken in Senegal to combat diarrhoea and dysentery; the shoots and roots may also be used, while in neighbouring The Gambia the leaves are chewed for queezy tummy, a treatment said to work very well. In the lagoon area of coastal Ivory Coast young twigs serve as chew-sticks. Water in which the leaves have been boiled is taken in Senegal to assist menstruation. The astringency of these preparations may be masked by the addition of lime juice. A leaf infusion is drunk in Hawaii and Trinidad, and in Indonesia for medial purposes.

Pulped leaves are made up into a suppository in Congo for treating piles. Ground up with kaolin and water to a paste, they are applied in Ghana to the body as an ointment for measles. A leaf extract enters into a Nigerian remedy for skin infections, and examination has shown a positive action on Gram-positive microbial organisms, but no action on Gram-negative organisms, nor any antifungal action. Three antibacterial substances have been detected in the leaves which are derivatives of quercetine. As in the bark polyphenols and many other substances are present.

The fruit is commonly eaten wherever the tree grows. Fruiting occurs at a young age, 2-3 years very often, but certainly by the 4^{th} year, and will continue over the usual life span of 30-40 years. The fruit is sweet. It is eaten raw or cooked. It makes good jam and is universally known for its jelly. The fruit is rich in vitamin C which is not destroyed by canning or dehydrating. Concentration varies within the fruit and according to the season and place of origin. It is rich also in calcium and phosphoris. The ripe fruit is mildly laxative. The unripe fruit is astringent, anti-diarrhoeic, and has medicinal use.

The tree has a wide variation in fruit size and quality, and selection of good cultivars is possible. Spontaneous populations, however, revert under random pollination to the small fruited form.

The seeds which are very small but abundant in the fruit and have been reported to contain 14% oil on dry weight, with 15% proteins and 13% starch.

Wyk, Ben-Erik van; **Oudtshoorn**, Bosch van and **Gericke**, Nigel. Medicinal Plants of South Africa. Briza Publications, Pretoria, South Africa. First edition 1997. ISBN No. 1-875093-09-5.

Plant parts used: The leaves are mainly used, sometimes the unripe fruit, bark or roots.

Medicinal use: Guava leaves are commonly used in South Africa as a remedy for diarrhoea. The leaves are also used for several other ailments, including diabetes, fever, cough, ulcers, boils, and wounds. The main ethnotherapeutic use in Africa is said to be for malaria. The leaf infusions are used in the Cape for diabetes.

Preparation and dosage: Crushed leaves are boiled in water and the infusion is either taken orally as a tea or as an enema. For severe diarrhoea, an infusion of one crushed leaf in a litre of water is used.

Active ingredients: Numerous tannins and other phenolic compounds have been identified from *P. guajava*, of which amritoside is of particular importance. Amritoside is a glycoside (gentiobioside) of ellagic acid. Another biologically interesting compound in the plant is guiajaverin, a glycoside (arabinopyroside) of quercetin. The leaves also contain essential oils and triterpenoids.

Pharmacological effects: Ellagic acid is a known intestinal astringent and haemostatic which explains the therapeutic value of the plant against diarrhoea and dysentery. The tannins are generally of value because of their vasoconstricting effects and their ability to form a protective layer on the skin and mucosas. These effects, together with proven antibacterial and antifungal activity, result in effective treatment of both internal and external infections. Quercetin (and its glycosides) undoubtedly also contribute to the efficacy of the medicine, because it is a known antioxidant with anticarcinogenic, anti-HIV and antibiotic effects. Hypoglycaemic effects have been documented.

Distribution: The guava occurs naturally in Central America but has become naturalised in many parts of the world, including Africa. In South Africa it is found as a weed in the warm subtropical areas of KwaZulu-Natal, Mpumalanga and the Northern Province.

Ayensu, E.S.: Medicinal Plants of West Africa. 1978. Reference Publications, Algonac, Michigan. ISBN No. 0-917256-07-7.

Psidium guajava

Ghana: gua, aduaba; oguawa, eguaba, gouwa, aduaba

India: mansala, amrud, peyara, perala, koyya, goyya, lal-jam, sufed-jam, tambara peru, pandhara peru, shivappu-goyya-pazham, vellai-goyya-pazham, tella-jam-pandu, erra-jam-pandu, beli-shebi-hannu, kempu-dhibe-hannu, dhop-goachi-phal, lal-goachi-phal, lal-safri-am, sufed-safri-am.

Leaf: astringent for bowels, wounds, ulcers (India); cholera to arrest vomiting (leaf decoction; India); diarrhea (leaf decoction; Indoia, Ghana); cerebral infections (leaf infusion; India); nephritis, cachexia (leaf infusion; India); rheumatism (pounded leaves; India);

epilepsy, chorea (leaf extract; India); toothache (chew leaves; Ghana); constipation (leaf infusion; Ghana); febrifuge, antispasmodic bath (decoction shoots and young leaves; W. Indies).

Stem, twigs: astringent (bark; India, Ghana); childhood diarrhea (bark; India); diarrhea (bark; India, Ghana); febrifuge, antispasmodic bath (decoction of shoots and young leaves; W. Indies)

Root: astringent (root bark; India, Ghana); childhood diarrhea (root bark; India); diarrhea (roots with water; India, Ghana); dysentery (roots with water; Ghana, India).

Fruit: astringent (green fruit; India, Ghana); laxative (ripe fruit; India); diarrhea (India, Ghana); dysentery (Ghana, India); medical use (Ghana).

Conway, Peter: Tree Medicine – a comprehensive guide to the healing power of over 170 trees. 2001, Judy Piatkus (Publishers) Ltd. ISBN No.0-7499-2173-0 in hardback 2002 paperback ISBN No.0-7499-2173-7.

Psidium guajava

COMMON NAME Guava.
PLANT FAMILY Myrtaceae.
RELATED SPECIES *P. acutangulum*; *P. densiconum*; *P. guianense*.
RANGE Tropical America.
PARTS USED Bark, flowers, fruit, leaves.

OVERVIEW
This small tree usually grows between 5-1 Om (15-30 ft) in height. It bears large berries (yellow when ripe) the size of tennis balls, known as guava fruits, these delicious fruits are rich in vitamins A and C and are therefore an important nutritive. Guavas are up to 5 times richer in vitamin C than oranges. Several other parts of the tree have medicinal uses treating digestive,
menstrual and other problems. In South Africa, where guava trees have become naturalized, the leaves are used to treat diabetes, fevers (including that of malaria), coughs and wounds. Research has demonstrated that the leaves and bark are active against the amoebae that cause dysentery.

PHYTOCHEMCALS
Bark: Tannins.
Fruits: Pectin, vitamins A and C.
Leaves: Glycoside (amritoside), volatile oil.

ACTIONS
Bark: Astringent.
Flowers: Menstrual agent.
Fruit: Nutritive.
Leaves: Astringent.

INDICATIONS

Internally
Bark: Diarrhoea and dysentery.
Flowers: Menstrual problems.
Fruits: As a restorative aid in convalescence, bleeding gums.
Leaves: Diarrhoea and dysentery, malaria.
Externally
Flowers: Conjunctivitis.
Leaves: Leucorrhoea (a white vaginal discharge), mouth ulcers.

PREPARATIONS
Internally
Bark: Decoction.
Flowers: Infusion.
Fruits: Eaten fresh.
Leaves: Infused.
Externally
Leaves: Infused and used as a mouthwash or chewed for mouth ulcers. Infused and applied as a douche for leucorrhoea.
Flowers: As a poultice for conjunctivitis.

CAUTIONS
None found.

Dey, Kanny Lall: The indigenous drugs of India - short descriptive notices of the principal medicinal plants met with in British India. 2nd edition. Thacker, Spink & Co. 1896. Calcutta. ISBN No. not available.

Psidium guyava
var. *pyriferum* (white) and *pomiferum* (red)

The Guava.

Vern.- *Beng*.-Goachhi-phal, Piyara; *Hind*.-Am, Amrut; *Bom.* –Perala; *Tam.*.-Goyya-pazham; *Tel.* .-Jam-pandu.

This tree, natural order Myrtocece, cultivated nearly all over India and common in Bengal, is much valued on account of its pleasant fruit which forms when stewed the well-known guava jelly. The stem bark has attracted some attention as an astringent, and has been found to contain about 25 per cent of tannic acid.

Medicinal uses.-The root-bark has been recommended in chronic infantile diarrhoea, in decoction of 1/2 oz. in 6 oz of water, boiled down to 3 oz., and given in teaspoonful doses: and as a local application in prolapsus ani of children.