

Piper methysticum

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Piperaceae

LOCAL NAMES

English (inebriating pepper, kava-kava, ava pepper, intoxicating pepper, kava); French (ava, kawa-kawa, kava); Indonesian (bari, wait, wagi)

BOTANIC DESCRIPTION

Piper methysticum is a dioecious, woody perennial shrub, 2-4 m tall, with a massive base at or just below the ground (crown or short rootstock) from which several shoots arise, giving the plant an overall rosette appearance. Each main stem is erect, 1-3 cm in diameter, green, red-brown or dark purple and looks jointed due to the swollen nodes and prominent scars left by abscission of leaves and branches.

Leaves alternate, deciduous, heart-shaped, 10-30 cm x 8-23 cm; stipules large, persistent; petiole 2-7 cm long, margin entire, apex acute, glabrous to finely pubescent, palmately veined.

Inflorescence a spike, axillary or opposite the leaves but much smaller; pedicel 1.5 cm long; spike 3-9 cm long, with small unisexual flowers without sepals or petals; the male spike bears numeral flowers with 2 short stamens; the female spike bears flowers with a single basal ovule in an unilocular ovary topped by a stigma.

Fruit seldom produced; a berry containing one seed.

The plant derives its name from Piper (Latin for pepper) and methysticum (Greek for intoxicating). The word kava is used to refer both to the plant and the beverage produced from it (Wikipedia)

BIOLOGY

Kava reproduction is asexual. Although the species is dioecious, most plants are male; female plants are very rare. Occasionally monoecious plants are found. Once established the older stolons enlarge to form a short rootstock, from which new shoots grow. Additional shoots arise at the periphery of the crown throughout the plant life. Natural senescence occurs at 15-30 years after planting.



Stems at Nahiku, Maui, Hawaii. (Forest & Kim Starr (USGS))



Leaves and inflorescence at Nahiku, Maui, Hawaii. (Forest & Kim Starr (USGS))



Habit at Maui Nui Botanical Garden, Maui, Hawaii. (Forest & Kim Starr (USGS))

ECOLOGY

Grows on rich well-drained soil in mountain areas, preferring shade when young and full sun when established. It grows well in multi-crop gardens. It is susceptible to damage by moderate to strong winds.

BIOPHYSICAL LIMITS

Altitude: 0-800 m

Temperature: 20–35°C

Rainfall: 1000-3000 mm

Soil type: Deep, fertile, well drained, pH 5.5-6.5

DOCUMENTED SPECIES DISTRIBUTION

Native: Vanuatu

Exotic: Fiji, Germany, Papua New Guinea, Samoa, Solomon Islands, Tonga



The map above shows countries where the species has been planted. It does neither suggest that the species can be planted in every ecological zone within that country, nor that the species can not be planted in other countries than those depicted. Since some tree species are invasive, you need to follow biosafety procedures that apply to your planting site.

PRODUCTS

Medicine: Roots (and stems) used medicinally throughout the Pacific and grown commercially for export to the U.S. and elsewhere, as a mild euphoriant and anesthetic, hypnotic also a mild sedative; roots, stems, and leaves used medicinally to treat convulsions, stiffness, toothaches, sore throats, stomachache, backache, respiratory diseases, filariasis, intestinal parasites, and venereal disease; kava exported to Germany as an ingredient in medicines to treat high blood pressure. Root decoction and leaves were chewed by women as contraceptive; juice from fresh leaves used as an embrocation on wounds.

Alcohol: A major social and ceremonial beverage of considerable cultural importance; large roots and lower stems crushed or pounded and mixed with water to produce "kava," an alkaloid stimulant that has a mild narcotic, sedative, or soporific effect and that is drunk both ceremonially and as a social beverage.

Other uses: kava is often used as a medium of social and religious interaction. In kava utilizing culture, the plant is an important and indispensable item of gift-giving to other people, or for religious offerings to the spirits.

TREE MANAGEMENT

Weeding is necessary in the first 2 years. Field spacing varies widely depending on the nature and intensity of the other crops, but 2x2 m (2500 plants/ha) is preferred. Earthing up is essential to ensure massive proliferation of rootstock. Manures and composts should be applied since it requires high nutrient supply; compound inorganic NPK fertilizer (12-12-20) or urea (with 46% N) can also be used; year round moisture is beneficial.

Kava is best harvested when 2-4 years old, but may be allowed to stand for up to a decade; harvesting can be done any time of the year; and involves cutting off the stems and digging up the rootstock. Kava yields vary with age and cultivar. Fresh weight yields are 10-60 kg/plant, and 6.6 t/ha for kava intercropped with coconut.

PESTS AND DISEASES

Kava suffers from dieback disease caused by the cucumber mosaic cucumovirus transmitted by aphids. The symptoms are wilting and dieback of the shoot. Another disease is anthracnose caused by *Glomerella* species. The kava weevil borer is the most serious pest. This can be controlled by careful field sanitation and hot water treatment of planting material.

FURTHER READING

Akana A. 1922. Hawaiian Herbs of Medicinal Value. reprint. Rutland, Vermont: Charles, E. Tuttle, Co.

Cambie RC & Ash J. 1994. Fijian medicinal plants. Commonwealth Scientific and Industrial Research Organisation, Australia.

Davis RI & Brown JF. 1996. Epidemiology and management of kava dieback caused by cucumber mosaic cucumovirus. *Plant Disease* 80(8).

<http://en.wikipedia.org/wiki/Kava>

<http://www.stevenfoster.com/education/monograph/kava.html>

Laird SA. 1999. The botanical medicine industry. In *The commercial use of biodiversity: access to genetic resources and benefit sharing*, ten Kate, K. and Laird, S.A. (eds). Earthscan, London.

Lebot V & Levesque J. 1989. The origin and distribution of kava (*Piper methysticum* Forst.f. and *Piper wichmannii* C. DC., Piperaceae): A phytochemical approach. *Allertonia* 5.

Lebot V et al. 1992. *Kava: The Pacific Drug*. Yale University Press, New Haven and London.

Lebot V, Merlin M & Lindstrom L. 1997. *Kava: the pacific elixir: the definite guide to its ethnobotany, history and chemistry*. Healing Arts Press, Rochester Vt, US

Leung AY & Foster S. 1996. *Encyclopedia of common natural ingredients used in food, drugs and cosmetics* (2nd ed.). John Wiley & Sons, New York, United States.

Onwueme IC & Papademetriou M. 1997. The kava crop and its potential. RAP Publication 1997/12. Food and Agricultural organization of the United Nations, Regional Office for Asia and the Pacific (RAP), Bangkok, Thailand.

van der Vossen HAM & Wessel M (eds.). 2000. *Plant Resources of South East Asia No. 16. Stimulants*. Backhuys Publishers, Leiden, the Netherlands.

Whistler WA. 1992. *Polynesian Herbal Medicine*. National Tropical Garden, Lawai, Kauai, Hawaii.

SUGGESTED CITATION

Orwa C, Mutua A, Kindt R, Jamnadass R, Simons A. 2009. *Agroforestry Database: a tree reference and selection guide version 4.0* (<http://www.worldagroforestry.org/af/treedb/>)