

# Mitragyna speciosa Korthals

## Kratom



Branch tip and flower of the kratom tree (*Mitragyna speciosa*).

The typical leaf arrangement of the genus *Mitragyna*.

### Family

Rubiaceae (Coffee Family)

### Forms and Subspecies

None

### Synonyms

*Mitragyna religiosa* nom. nud.  
*Mitragyne speciosa* (Korth.) (misspelling in the literature)

### Folk Names

Biak, biak-biak, gra-tom, katawn, kratom, kraton, kutum, mabog, mambog, mitragyne

### History

In the nineteenth century, it was reported that kratom was being used in Malaysia as an opium substitute and to heal "opium addiction" (Beckett, Shellard, and Tackie 1965, 241; Tyler 1966, 285\*; Wray 1907a, 1907b). Phytochemical research into the plant began around 1920 (Field 1921). Pharmacological studies of the main active constituent began soon thereafter (Grewal 1932a, 1932b).

### Distribution

The tree is indigenous to Thailand and from the northern Malay Peninsula to Borneo and New Guinea (Macmillan 1991, 416\*).



### Cultivation

The tree grows in marshy regions. No information about propagation is available.

### Appearance

This tropical tree or shrub often grows to a height of only 3 to 4 meters, although it will sometimes grow as tall as 12 to 16 meters. It has a straight trunk with forked branches that grow upward obliquely. The oval, green leaves have a very large surface area (being 8 to 12 cm long) and are tapered at the ends. The deep yellow flowers grow in globular clusters attached to the leaf axils on long stalks. The seeds are winged (Emboden 1979, 184\*).

Kratom is easily confused with other members of the genus *Mitragyna*, such as the African species *Mitragyna brunonis* (Wall, ex G. Don) Craib.

### Psychoactive Material

— Leaves (kratom)

### Preparation and Dosage

The dried leaves can be smoked, chewed, or made into the extract known as *kratom* or *mambog* (Wray 1907b). They also can be powdered, brewed with hot water, and drunk as a tea; 8.8 g has been given as a dosage (Macmillan 1991, 416\*). Another method of preparation involves powdering the dried leaves and boiling them in water until a syrup results (which is easy to preserve); a dosage of this is 0.38 g. The syrup can be mixed with finely chopped leaves of the palas-palm (*Linnæa paludosa*) and made into pills. This product is known as *madar* in Malaysia and is smoked in long bamboo pipes (Macmillan 1991, 416\*).

The fresh leaves can be chewed together with betel nuts (*Areca catechu*) (Scholz and Eigner 1983, 75\*). Salt is often added to prevent constipation. A typical user will chew three to ten mouthfuls of leaves through the day (Suwanlert 1975).

The main active constituent, mitragynine, appears to be well tolerated and has few toxic effects even when taken in high dosages. In studies with mice, even extreme dosages of 920 mg/kg body weight did not produce any toxic effects (Jansen and Prast 1988, 117\*).

### Ritual Use

In Thailand, kratom is used primarily as an opium substitute. It is possible that some type of ritual method of use similar to opium smoking may have developed (see *Papaver somniferum*). Unfortunately, this area has not been the subject of ethnographic research.

**Artifacts**

None

**Medicinal Use**

In Thai medicine, kratom is used to treat diarrhea (Ott 1993, 413\*). Drivers of *tuk-tuks* (three-wheeled motorized "taxis") in Bangkok consume kratom as an amphetamine substitute (Schuldes 1995, 52\*). In Malaysia, the leaves are used as a folk medicinal treatment for worms (Said et al. 1991).

In West Africa, the related species *Mitragnyna stipalosa* (DC.) O. Kuntze is used in folk medicine as a local anesthetic. The bark is drunk in palm wine (cf. *Cocos nucifera*) to counteract poisoning and as a diuretic (Ayensu 1978, 222\*).

**Constituents**

The plant contains numerous **indole alkaloids**: mitragynine, ajmalicine, corynanthedin, isomitrphylline, mitrephylline, mitraversine, paynanthine, specioygnine, speciofoline, speciohylline, stipularine (= rotundifoline), rhyndophylline, mitragynaline, corynantheidinaline, mitragynalinic acid, and corynantheidinalinic acid (Beckett, Shellard, Philipson, and Lee 1965; Beckett, Shellard, and Tackie 1965; Houghton et al. 1991; Tyler 1966, 286\*).

The main active constituent, mitragynine (66% of the total alkaloid mixture), is present especially in the leaves. Young leaves of plants of Thai origin contain 7 $\alpha$ -hydroxy-7H-mitragynine (1.6% of the total alkaloid mixture) (Ponglux et al. 1994). A total of approximately 0.5% alkaloids is present in the dried leaves (Beckett, Shellard, and Tackie 1965, 242). A new indole alkaloid, 3-dehydromitragynine, was discovered in the fresh leaves (Houghton and Said 1986).

Mitragynine is chemically related to psilocybin and other ergot alkaloids (D. McKenna 1995, 102\*), e.g., alstovenine (cf. *Alstonia scholaris*). Mitrephylline and isomitrphylline belong to the yohimbine type (Ponglux et al. 1994).

The fresh leaves also contain (-) epicatechine. Several flavonoids are present in the dried leaves. Both the dried and the fresh leaves have been found to contain ursolic acid (Said et al. 1991).

The alkaloid mitraspecine is present in the wood and bark (Beckett, Shellard, and Tackie 1965).

Several of these alkaloids also occur in other species (e.g., *Mitragnyna parvifolia*) (Jansen and Prast 1988, 115; Shellard 1974, 1983).

**Effects**

Self experiments, the descriptions contained in the literature, and the pharmacological properties of the constituents indicate that the effects of kratom are simultaneously stimulating like those of coca (*Erythroxylum coca*) and sedating like those of opium (see *Papaver somniferum*)—in

other words, paradoxical (Ponglux et al. 1994). Kratom's effect is as if one were chewing coca while smoking opium (Jansen and Prast 1988). When fresh leaves are chewed, the stimulating effects can begin in as soon as five to ten minutes (Suwanlert 1975).

The pure alkaloid mitragynine has the following primary effects: "a) increase in the excitability of the cranio sacral and sympathetic portion of the involuntary nervous system, b) increase in the excitability of the medulla and the motor centers of the CNS" (Scholz and Eigner 1983, 75\*). These are indeed indications of a paradoxical substance (cf. Grewal 1932a, 1932b; Jansen and Prast 1988). The effects of mitragynine have even been compared to those of codeine (Macko et al. 1972).

The alleged kratom addiction is said to be a Thai cultural phenomenon (Jansen and Prast 1988, 117).

**Commercial Forms and Regulations**

Although the plant does not produce addiction per se, it does alter behavior, and it is now illegal in Thailand (D. McKenna 1995, 102\*; Said et al. 1991; Schuldes 1995, 52\*). Apart from this, the plant is not subject to any regulations. Unfortunately, no commercial forms are available.

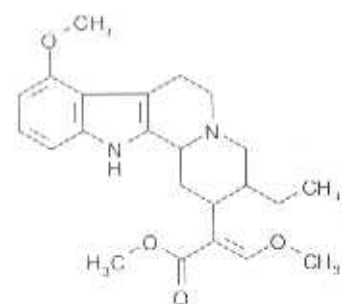
**Literature**

See also the entries for *Alstonia scholaris* and indole alkaloids.

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"*Mitragnyna speciosa*. . . Its leaves have narcotic properties like opium. Just as with opium, regular use of the plant can lead to addiction."

H. F. MacMILLAN  
TROPICAL PLANTING AND  
GARDENING  
(1991:416\*)



Mitragynine



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## *Mucuna pruriens* (Linnaeus) DC.

### Cowhage

"The total indole alkylamine content [of cowhage] was studied from the point of view of its hallucinogenic activity. It was found that marked behavioral changes occurred which could be equated with hallucinogenic activity."

RICHARD SCHULTES AND ALBERT HOFMANN  
*PLANTS OF THE GODS*  
(1992, 50<sup>7</sup>)

#### Family

Leguminosae-Papilionaceae (Legume Family): Subfamily Papilionoideae: Phaseoleae, Erythrinae Tribe

#### Forms and Subspecies

The species can be divided into at least two or three subspecies (Zander 1994, 385<sup>7</sup>; Lössak and McCarthy 1992, 66<sup>7</sup>):

*Mucuna pruriens* (L.) DC. ssp. *deeringiana* (Bort) Hanelt

*Mucuna pruriens* (L.) DC. ssp. *pruriens*

*Mucuna pruriens* (L.) DC. ssp. *gigantea* (15 cm long fruits)

*Mucuna utilis* Wall. ex Wight, once considered a species in its own right, is now regarded as a variety (Allen and Allen 1981, 448<sup>7</sup>): *Mucuna pruriens* (L.) DC. var. *utilis* (Wall. ex Wight) Backer.

#### Synonyms

*Dolichos pruriens* L.

*Mucuna deeringianum* (Bort) Merr.

*Mucuna prurita* Hook. f.

*Mucuna prurita* Wight

*Mucuna utilis* Wall. ex Wight

*Mucuna utilis* Wall. ex Wight var. *utilis* Backer ex Burck

*Stizolobium deeringianum* Bort

*Stizolobium pruriens* (L.) Medik.

*Stizolobium pruritum* Pipet

#### Folk Names

Acharriya-pala, afrikanische juckbohne, akushi (Bengali), baidhok, balagana, chiikan (Mayan), chipororo, chiporro, cowhage, cowhage-winde, cowitch, cow itch, demar pirkok (Cuna), haba, huacawuru (Shipibo), itchweed, juckboontje (Dutch), juckbohne, juckende fasei, jucktasel, kachaguli, kawanch, kiwachi (Hindi, "bad to rub"), korodu, kuhkrätze, mucunan, ojo de vaca (Spanish, "eye of the cow"), ojo de venado (Spanish, "eye of the deer"), ojo de zamuro, oyobe, pica pica, pois à gratter, pois pouilleux, pwa gwate, shabun baranti (Shipibo), siliqua hirsuta, velvet bean, wich yuk (Lacandon, "deer eye"), wodza, zizi, zootie

#### History

Almost nothing is known about the early history of the plant. In India, it has long been used for ethnomedicinal purposes. The genus name *Mucuna* is derived from the Tupi word *macuanã*, which is used in Amazonia to refer to several members of the genus (Allen and Allen 1981, 446<sup>7</sup>). In 1688, Hans Sloane brought to London a collection of cowhage seeds that were exhibited there as "itch powder" (Allen and Allen 1981, 447<sup>7</sup>). One substance obtained from the plant, L-dopa, has become rather well known and has revolutionized the treatment of Parkinson's disease (Remmen and Ellis 1980).