
Mangifera odorata

Scientific Name

Mangifera odorata Griffith

Synonyms

Mangifera foetida Lour. var. *bakkill* (Miq.);
Mangifera foetida Lour. var. *bombom* Blume;
Mangifera foetida Lour. var. *kawini* Blume;
Mangifera foetida Lour. var. *mollis* Blume;
Mangifera foetida Lour. var. *odorata* (Griffith)
Pierre; *Mangifera oblongifolia* Hook.f.;
Mangifera odorata Griffith var. *pubescens* Engl.

Family

Anacardiaceae

Common/English Names

Fragrant Mango, Kuini, Kurwini Mango, Kwini,
Kwini Mango, Saipan Mango

Vernacular Names

Dutch: Kweni;

French: Mangué Odorante, Manguier À Fruit
Odorant, Manguier Odorant, Kuweni;

Indonesia: Kalimbang Kuini, Kawidei Kepaya,
Kawilei Kapaya, Kawilei Kuini, Kombilei

Chapya, Kmbilo Insam, Kmbiloi Koini, Oi
Kapaya, Oi Kuini, Uwai Kuini (Alfoersch, N.
Sulawesi), Mancang (Acheh, Sumatra), Kweni,
Weni (Bali), Ancami (Bari, Sulawesi), Ambasang,
Embasang, Gorat, Kuweni (Batak), Fu Huni
(Bima, Timor), Pao Daeko (Boeigeesch,
Sulawesi), Mangga Kuini (Boeol, Sulawesi),
Ruone (Boeroe, Maluku), Ori Asula Kowini (E.
Ceram, Maluku), Kuin, Kuine (W. Ceram,
Maluku), Guin, Kuini (S. Ceram, Maluku),
Ambacang, Pangi (Dyak), Pao Jawa (Flores),
Lukup (Gajo, Sumatra), Mangga Kuini, Oile
Koini (Gorontalo, Sulawesi), Kuweni, Pakel,
Kebembem (Java), Guawe Sitingki, Hitinki,
Sitingki (N. Halmaheira), Lelit Salo (S.
Halmaheira), Kuini (Lamong, Sumatra), Taipa
Macang (Makassar), Asam Membacnag, Kweni
(Jambi, Sumatra), Kuini (Lingga, Sumatra),
Bine, Bemberm, Beni, Kaeni, Kaweni
(Madurese), Gandarasa, Kebembem, Keweni,
Macang, Membacang (Malay), Lekup, Mangga
Kuini (Manado, Sulawesi), Ambacang,
Embacang, Kuwini, Lakuik (Minangkabau),
Hambawa (Nias, Sumatra), Babkang, Koine,
Mamblang, Koine, Mangga Koim (Oelias,
Maluku), Bembem, Kaweni (Sundanese), Guwa
Stinki (Ternate), Guwa Stinki (Tidore, Ternate);
Malaysia: Mangga Wani, Wani (Sabah), Bachang
Beto (In Semang), Kwini Boli, Kwini, Kuini,
Kohini;

Philippines: Kuwini, Uani (Cebu, Bisaya),
Huani, Kandupéh; **Thailand:** Mamuang Chingreet,
Mamuang Paa (Central);

Vietnamese: Xoai Huong, Cay Muong.

Origin/Distribution

The exact origin of the species is unknown. It is only known in cultivation as wild distribution has not been encountered. The species is primarily cultivated in Malesia – Peninsular Malaysia – (Perak, Kelantan, Malacca, Pahang); Singapore; Sumatra – (Lamong, Sibolangit); Java (Pekalongan, Bantam, Batavia); and Sabah – (Sandakan, Sipitang, Bukit Penampang). It is also cultivated to a lesser extent in Southern Thailand, south Vietnam, Philippines, Christmas Island and Guam.

Agroecology

M. odorata is strictly a tropical species. It grows below 1,000 m altitude in areas with a fairly heavy rainfall that is uniformly distributed throughout the year, although it grows even with a moderate rainfall (1,200 mm) provided there are no prolonged dry periods. It can be found in lowland mixed forests but is mainly cultivated.

Edible Plant Parts and Uses

The pulp of the ripe fruit is eaten raw. Ripe and unripe fruit are also eaten as rujak. They must be peeled thick because of the presence of an acrid juice in the skin, which can also be reduced by steeping in diluted lime-water before eating. The unripe fruit is also used for making chutney and for pickles with salt and also used in curries. In Java the seeds are used for making a kind of flour for preparing the traditional delicacy *jenang pelok* (a thick pappy preparation from *Curcuma* rhizomes) or dodol (with gelatinous rice).

Botany

A medium-sized, evergreen tree, 10–30 m, rarely more than 30 m high with a round or broadly ovoid canopy, straight trunk with grey, smooth or fissured bark, containing caustic sap. Leaves are coriaceous-chartaceous, oblong-lan-

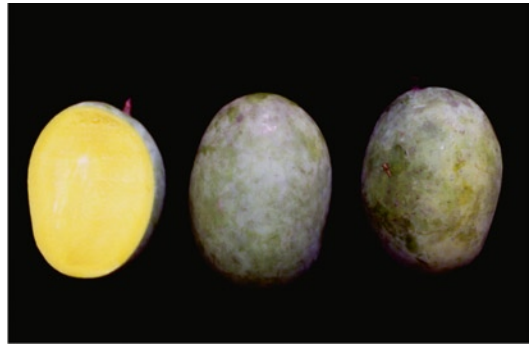


Plate 1 Oblongish kwini fruit with yellow flesh

ceolate, 12–35 cm×4–10 cm, glabrous, with entire margin, shortly acuminate apex, cuneate or obtuse base with 15–25 pairs of lateral nerves, prominent reticulated veins especially on the lower surface, petioles are 3–7 cm and swollen at base. Panicles are terminal, divaricate, pyramidal, 15–50 cm long, rather densely flowered, rachis is yellowish-green tinged with reddish-brown. Flowers are 5(–6)-merous, about 6 mm across, fragrant; sepals ovate, 3–4 mm long, brown-red or partly green; petals lanceolate, 5–6 mm×1.2–2 mm, yellowish at the base, pale pinkish towards the apex, reflexed, with 3–5 ridges on 2/3 of the length of the petals, joined at the base, pale yellow becoming dark red; stamens 5(–6), only 1 fertile, with 5 mm long filament and oblong anthers, staminodes 1.5–2 mm long; ovary subglobose, yellowish, style excentric, 3–5 mm long, dark red. Fruit an obliquely ellipsoid-oblong or oblong drupe, 10–13 cm×6–9 cm, green to yellowish-green, sparingly spotted with dark brown lenticels; fairly thick (3–4 mm) rind; flesh yellow to orange-yellow, firm, fibrous (Plates 1 and 2), sweet to acid-sweet, juicy, with a strong smell and flavour of turpentine. Stone (endocarp) is 8–10 cm×4.5–5 cm×2.5–3 cm. Seed is usually polyembryonic.

Nutritive/Medicinal Properties

The nutrient composition of the flesh of *M. odorata* per 100 g edible portion was reported as: water 80 g, energy 69.3 kcal., protein 0.9 g,



Plate 2 Obliquely elliptic-oblong kwini fruit with golden yellow fibrous flesh

fat 0.1 g, carbohydrate (including fibre), vitamin A 600 IU, thiamin 0.04 mg, riboflavin 0.06 mg, niacin 0.7 mg, ascorbic acid 13 mg. (Pareek et al. 1998). Analyses conducted in Malaysia by Tee et al. (1997) reported the following nutrient composition per 100 g edible portion: energy 83 kcal, water 79.5 g, protein 1.0 g, fat 1.8 g, carbohydrate 15.6 g, fibre 1.4 g, ash 0.7 g, Ca 9 mg, P 13 mg, Fe 0.4 mg, Na 2 mg, K 187 mg, carotenes 1888ug, vitamin A 315ug RE, vitamin B1 0.05 mg, vitamin B2 0.07 mg, niacin 0.5 mg, vitamin C 23 mg.

Mangifera odorata, *Mangifera foetida* and *Mangifera pajang* fruit contain isoflavones, a major group of phytoestrogen that may serve as health promoting compounds in our diet. All three species were found to contain the isoflavones diadzein and genistein (Khoo and Ismail 2008). Studies showed that at optimised condition, *M. odorata* had comparatively higher daidzein (9.4–10.5 mg/100 g) and genistein (1.6–1.7 mg/100 g) contents. Daidzein content of *M. pajang* (8.3–8.7 mg/100 g) was higher than *M. foetida* (2.8–8.0 mg/100 g), but the genistein content of *M. pajang* (0.4–0.6 mg/100 g) was similar to that of *M. foetida* (0.4–0.8 mg/100 g).

In a study conducted in Malaysia, the total carotene content (mg/100 g) of selected underutilized tropical fruit in decreasing order (Khoo et al. 2008) was jentik-jentik (*Baccaurea polyneura*) 19.83 mg>Cerapu 2 (*Garcinia prainiana*) 15.81 mg>durian nyekak 2 (*Durio kutejensis*)

14.97 mg>tampoi kuning (*Baccaurea reticulata*) 13.71 mg>durian nyekak (1) 11.16 mg>cerapu 1 6.89 mg>bacang 1 (*Mangifera foetida*) 4.81>kuini (*Mangifera odorata*) 3.95 mg>jambu susu (*Syzygium malaccense*) 3.35 mg>bacang (2) 3.25 mg>durian daun (*Durio lowianus*) 3.04 mg>bacang (3) 2.58 mg>tampoi putih (*Baccaurea macrocarpa*) 1.47 mg>jambu mawar (*Syzygium jambos*) 1.41 mg. β -carotene content was found to be the highest in jentik-jentik 17,46 mg followed by cerapu (2) 14.59 mg, durian nyekak (2) 10.99 mg, tampoi kuning 10.72 mg, durian nyekak (1) 7.57 mg and cerapu (1) 5.58 mg. These underutilized fruits were found to have acceptable amounts of carotenoids and to be potential antioxidant fruits.

Seventy-three volatile components were identified in the kuini (*M. odorata*) and 84 volatiles in bachang fruit (*M. foetida*). Oxygenated monoterpenes (45.4%) and esters (33.0%) constituted the main classes of kuini fruit volatiles, and α -terpineol (31.9%) was the major component (Wong and Ong 1993). Among the bachang fruit volatiles, esters (55.7%) and oxygenated monoterpenes (20.3%) were dominant, with ethyl butanoate (33.4%) the most abundant. The volatile composition of both fruits differs significantly from results reported for the fruits of some of the commercially important mango (*M. indica*) cultivars.

In folk medicine, the bark is recommended for external application in hystero-epilepsy, in the form of a compound like a cosmetic mixture. The sap from the tree and unripe fruit is caustic and has been reported to cause dermatitis.

Other Uses

The wood is used locally as bachang (*M. foetida*), but is reportedly of poor quality.

Comments

Mangifera odorata is a highly polymorphic species and apparently includes many forms of a hybrid swarm. In West Java, several forms are

distinguished: – ‘*kebembem* or *bembem*’, the fruit has a strong smell and taste of turpentine reminiscent of the fruit of *M. foetida*, the leaves are coriaceous, restricted to the Soenda provinces. *Bembem* is identical with *Pelem lengis* from Solo; – ‘*keweni*’, with less fibrous flesh and a mild taste of turpentine; the most common form and the best forms are very palatable; – ‘*gandarassa*’ of the Bantem area in West Java, a rare and poorly known form which is said to be superior to ‘*keweni*’, less sweet but more juicy and with a mild odour. Another form worthy of mention is *Keweni loorik*. In the Philippines ‘*sangay*’, known from Jolo, is distinguished by its yellow colour at maturity from the greenish ‘*huani*’ fruit. Ding Hou (1978) suggested *M. odorata* to be a hybrid between *M. indica* L. and *M. foetida* Lour. due to morphological intermediacy. Recent studies using amplified fragment length polymorphism (AFLP) analysis confirmed the hybrid status of *M. odorata* (Teo et al. 2002). All the *M. odorata* samples additively inherit bands specific to *M. indica* and *M. foetida*, which strongly suggested the hybrid origin. *Mangifera odorata* was closer to *M. foetida* than to *M. indica*, indicating that backcrossing with *M. foetida* might have taken place.

Selected References

- Bompard JM (1992) *Mangifera odorata* Griffith. In: Verheij EWM, Coronel RE (eds) Plant resources of South-East Asia, No. 2. Edible fruits and nuts. Prosea Foundation, Bogor, pp 218–220
- Burkill IH (1966) A dictionary of the economic products of the Malay Peninsula. Revised reprint, 2 vols. Ministry of Agriculture and Co-operatives, Kuala Lumpur, vol 1 (A–H), pp 1–1240, vol 2 (I–Z), pp 1241–2444
- Ding Hou (1978) Anacardiaceae. In: van Steenis CGGJ (ed) Flora Malesiana, Series I, vol 8. Sijthoff & Noordhoff, Alphen aan den Rijn, pp 395–548, 577 pp
- Khoo HE, Ismail A (2008) Determination of daidzein and genistein contents in *Mangifera* fruit. Malays J Nutr 14(2):189–198
- Khoo HE, Ismail A, Mohd.-Esa N, Idris S (2008) Carotenoid content of underutilized tropical fruits. Plant Foods Hum Nutr 63:170–175
- Kostermans AJGH, Bompard JM (1993) The mangoes: their botany, nomenclature, horticulture and utilization. Academic, London, 233 pp
- Ochse JJ, Bakhuizen van den Brink RC (1931) Fruits and fruitculture in the Dutch East Indies. G. Kolff & Co., Batavia, 180 pp
- Pareek OP, Sharma S, Arora RK (1998) Underutilized edible fruits and nuts: an inventory of genetic resources in their regions of diversity. IPGRI Office for South Asia, New Delhi, pp 191–206
- Slik JWF (2006) Trees of Sungai Wain. Nationaal Herbarium Nederland. <http://www.nationaalherbarium.nl/sungaiwain/>
- Tee ES, Noor MI, Azudin MN, Idris K (1997) Nutrient composition of Malaysian foods, 4th edn. Institute for Medical Research, Kuala Lumpur, 299 pp
- Teo LL, Kiew R, Set O, Lee SK, Gan YY (2002) Hybrid status of *kwiini*, *Mangifera odorata* Griff. (Anacardiaceae) verified by amplified fragment length polymorphism. Mol Ecol 11(8):1465–1469
- Wong KC, Ong CH (1993) Volatile components of the fruits of Bachang (*Mangifera foetida* Lour.) and Kuini (*Mangifera odorata* Griff.). Flav Fragr J 8(3): 147–151