

Durian

The **durian** (/ˈdʒʊəriən, ˈdʊr-, -æn/^[2] is the fruit of several tree species belonging to the genus *Durio*. There are 30 recognised *Durio* species, at least nine of which produce edible fruit, with over 300 named varieties in Indonesia, 100 in Thailand and 100 in Malaysia.^{[3][4]} *Durio zibethinus* is the only species available in the international market: other species are sold in their local regions. It is native to Borneo and Sumatra.^[3]

Named in some regions as the "king of fruits",^[5] the durian is distinctive for its large size, strong odour, and thorn-covered rind. The fruit can grow as large as 30 centimetres (12 in) long and 15 centimetres (6 in) in diameter, and it typically weighs one to three kilograms (2 to 7 lb). Its shape ranges from oblong to round, the colour of its husk green to brown, and its flesh pale yellow to red, depending on the species.

Some people regard the durian as having a pleasantly sweet fragrance, whereas others find the aroma overpowering with an unpleasant odour. The smell evokes reactions from deep appreciation to intense disgust, and has been described variously as rotten onions, turpentine, and raw sewage. The persistence of its odour, which may linger for several days, has led to the fruit's banishment from certain hotels and public transportation in southeast Asia. By contrast, the nineteenth-century British naturalist Alfred Russel Wallace described its flesh as "a rich custard highly flavoured with almonds". The flesh can be consumed at various stages of ripeness, and it is used to flavour a wide variety of savoury and sweet desserts in southeast Asian cuisines. The seeds can also be eaten when cooked.

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Etymology

Durian	
	
Durian	
	
Scientific classification 	
Kingdom:	Plantae
<i>Clade</i> :	Tracheophytes
<i>Clade</i> :	Angiosperms
<i>Clade</i> :	Eudicots
<i>Clade</i> :	Rosids
Order:	Malvales
Family:	Malvaceae
Subfamily:	Helicteroideae
Tribe:	Durioneae
Genus:	<i>Durio</i> <div>L.</div>
Type species	
<div><i>Durio zibethinus</i></div> <div>L.</div>	
Species	
There are currently 30 recognised species (see the <i>List of Durio species</i>)	
Synonyms	
<i>Lahia</i> Hassk. ^[1]	

First used around 1580, the name "durian" is derived from the Old Malay language word *dûrî* (meaning 'thorn'),^[6] a reference to the numerous prickly thorns of the rind, together with the noun-building suffix *-an*.^{[7][8]} The species name 'zibethinus' derives from the name of the civet (*Viverra zibetha*), known for its odour.^[9]

Taxonomy



Durian flowers are usually closed during the daytime

Durio sensu lato has 30 recognised species.^[10] *Durio sensu stricto* comprises 24 of these species. The 6 additional species included in *Durio s.l.* are now considered by some to comprise their own genus, *Boschia*.^{[11][12]} *Durio s.s.* and *Boschia* have indistinguishable vegetative characteristics and many shared floral characteristics. The crucial difference between the two is that anther locules open by apical pores in *Boschia* and by longitudinal slits in *Durio s.s.*^[13] These two genera form a clade that is sister to another genus in the tribe Durioneae, *Cullenia*. These three genera together form a clade that is characterised by highly modified (mono- and polythecate, as opposed to bithecate) anthers.^[11]

The genus *Durio* is placed by some taxonomists in the family Bombacaceae, or by others in a broadly defined Malvaceae that includes Bombacaceae, and by others in a smaller family of just seven genera Durionaceae.^{[1][14][15]}

Durio is often included in Bombacaceae because of the presence of monothecate anthers, as opposed to the bithecate anthers common to the rest of the mallows (and angiosperms, in general). However, the first studies to examine mallow phylogeny using molecular data found that the tribe Durioneae should be placed in the subfamily Helicteroideae of an expanded Malvaceae. The authors of these studies hypothesise that monothecate anthers have most likely evolved convergently in Durioneae and in the Malvatheca clade (comprising Malvaceae s.l. subfamilies

Malvoideae and Bombacoideae).^{[16][17]}

A draft genome analysis of durian indicates it has about 46,000 coding and non-coding genes, among which a class called *methionine gamma lyases* — which regulate the odour of organosulfur compounds — may be primarily responsible for the distinct durian odour.^[9] Genome analysis also indicated that the closest plant relative of durian is cotton.^[9]

Description

Durian trees are large, growing to 25–50 metres (82–164 ft) in height depending on the species.^[10] The leaves are evergreen, elliptic to oblong and 10–18 centimetres (3.9–7.1 inches) long. The flowers are produced in three to thirty clusters together on large branches and directly on the trunk with each flower having a calyx (sepals) and five (rarely four or six) petals. Durian trees have one or two flowering and fruiting periods per year, although the timing varies depending on the species, cultivars, and localities. A typical durian tree can bear fruit after four or five years. The durian fruit can hang from any branch, and matures roughly three months after pollination. The fruit can grow up to 30 centimetres (12 in) long and 15 centimetres (6 in) in diameter, and typically weighs one to three kilograms (2 to 7 lb).^[10] Its shape ranges from oblong to round, the colour of its husk green to brown, and its flesh pale-yellow to red, depending on the species.^[10] Among the thirty known species of *Durio*, nine of them have been identified as producing edible fruits: *D. zibethinus*, *D. dulcis*, *D. grandiflorus*, *D. graveolens*, *D. kutejensis*, *Durio lowianus*, *D. macrantha*, *D. oxleyanus* and *D. testudinarius*.^[18] The fruit of many species has never been collected or properly examined, however, so other species may have edible fruit.^[10] The durian is somewhat similar in appearance to the jackfruit, an unrelated species.



Juvenile durian tree in Malaysia. Mature specimens can grow up to 50 metres (160 feet)

D. zibethinus is the only species commercially cultivated on a large scale and available outside of its native region. Since this species is open-pollinated, it shows considerable diversity in fruit colour and odour, size of flesh and seed, and tree phenology. In the species name, *zibethinus* refers to the Indian civet, *Viverra zibetha*. There is disagreement over whether this name, bestowed by Linnaeus, refers to civets being so fond of the durian that the fruit was used as bait to entrap them, or to the durian smelling like the civet.^[19]

Durian flowers are large and feathery with copious nectar, and give off a heavy, sour, and buttery odour. These features are typical of flowers pollinated by certain species of bats that eat nectar and pollen.^[20] According to research conducted in Malaysia in the 1970s, durians were pollinated almost exclusively by cave fruit bats (*Eonycteris spelaea*);^[10] however, a 1996 study indicated two species, *D. grandiflorus* and *D. oblongus*, were pollinated by spiderhunters (Nectariniidae) and another species, *D. kutejensis*, was pollinated by giant honey bees and birds as well as bats.^[21]

Some scientists have hypothesised that the development of monothecate anthers and larger flowers (compared to those of the remaining genera in Durioneae) in the clade consisting of *Durio*, *Boschia*, and *Cullenia* was in conjunction with a transition from beetle pollination to vertebrate pollination.^[12]

Cultivars

Over the centuries, numerous durian cultivars, propagated by vegetative clones, have arisen in southeast Asia. They used to be grown with mixed results from seeds of trees bearing superior quality fruit, but now are propagated by layering, marcotting, or more commonly, by grafting, including bud, veneer, wedge, whip or U-grafting onto seedlings of randomly selected rootstocks. Different cultivars may be distinguished to some extent by variations in the fruit shape, such as the shape of the spines.^[10] Durian consumers express preferences for specific cultivars, which fetch higher prices in the market.^[22]

Thai varieties

Most cultivars have a common name and a code number starting with "D". For example, some popular clones are Sultan (D24), Kop (D99 Thai: กบ — "frog" Thai pronunciation: [kòp]), Chanee (D123, Thai: ชะนี — "gibbon" Thai pronunciation: [tʃá:niː]), Berserah or Green Durian or Tuan Mēk Hijau (D145 Thai: ทุเรียนเขียว — Green Durian Thai pronunciation: [tú:ri:ən k ĭ ow]), Kan Yao (D158, Thai: ก้านยาว — Long Stem Thai pronunciation: [kâ:n ja:w]), Mon Thong (D159, Thai: หมอนทอง — Golden Pillow Thai pronunciation: [mɔ̌:n tɔ̌:ŋ]), Kradum Thong (Thai: กระดุมทอง — Golden Button Thai pronunciation: [kràdum tɔ̌:ŋ]), and with no common name, D169. Each cultivar has a distinct taste and odour. More than 200 cultivars of *D. zibethinus* exist in Thailand.



Different cultivars of durian often have distinct colours. D101 (right) has rich yellow flesh, clearly distinguishable from another variety (left).

Mon Thong is the most commercially sought after, for its thick, full-bodied creamy and mild sweet-tasting flesh with relatively moderate smell emitted and smaller seeds, while Chanee is the best in terms of its resistance to infection by *Phytophthora palmivora*. Kan Yao is somewhat less common, but prized for its longer window of time when it is both sweet and odourless at the same time. Among all the cultivars in Thailand, five are currently in large-scale commercial cultivation: Chanee, Mon Thong, Kan Yao, Ruang, and Kradum.^[23] Since the 1920s, there have been more than 100 registered cultivars in Malaysia,^[24] and by 1992 there were up to 193;^[25] many superior cultivars have been identified through competitions held at the annual Malaysian Agriculture, Horticulture, and Agrotourism Show. In Vietnam, the cultivar, Musang King, is a common variety preferred by consumers.^[26]

By 2007, Thai government scientist Songpol Somsri had crossbred more than ninety varieties of durian to create Chantaburi No. 1, a cultivar without the characteristic odour.^[27] Another hybrid, Chantaburi No. 3, develops the odour about three days after the fruit is picked, which enables an odourless transport yet satisfies consumers who prefer the pungent odour.^[27] On 22 May 2012, two other cultivars from Thailand that also lack the usual odour, Long Laplae and Lin Laplae, were presented to the public by Yothin Samutkhiri, governor of Uttaradit Province from where these cultivars were developed locally, while he announced the dates for the annual durian fair of Laplae District, and the name given to each cultivar.^[28]

Malaysian varieties

Popular cultivars in Malaysia and Singapore (Singapore imports most of its durians from Malaysia, hence the varieties are similar although there may be slight variation in the names) include "D24", which is a popular variety known for its bittersweet taste; "XO", which has a pale colour, thick flesh with a tinge of alcoholic fermentation; "Chook Kiok" (Cantonese meaning: bamboo leg) which has a distinctive yellowish core in the inner stem; and "Musang King" ('musang' is the Malay word for palm civet) which is usually the priciest of all cultivars. Musang King is known for its bright yellow flesh and is like a more potent or enhanced version of the D24.^[26]

The Malaysian Ministry of Agriculture and Agro-Based Industry started to register varieties of durian in 1934. There are 13 common Malaysian varieties having favourable qualities of colour, texture, odour, taste, high yield, and resistance against various diseases.^[29]

Known locally as "durian IOI", this variety has a round shape, medium size, green and yellow outer skin colour, and has flesh easy to dislodge. The flesh is medium-thick, solid, yellow in colour, and sweet.^[30] Another common variety is "Hong xia", found in the states of Pahang and Johor.^{[31][32]} The fruit is medium-sized with oval shape, brownish green skin having short thorns. The flesh is thick, not solid, yellow coloured, and has a sweet taste.^[29]

Cultivation and availability

The durian is cultivated in tropical regions, and stops growing when mean daily temperatures drop below 22 °C (72 °F).^[18] The centre of ecological diversity for durians is the island of Borneo, where the fruits of the edible species of *Durio* including *D. zibethinus*, *D. dulcis*, *D. graveolens*, *D. kutejensis*, *D. oxleyanus*, and *D. testudinarius* are sold in local markets.

D. zibethinus is not grown in Brunei because consumers there prefer other species such as *D. graveolens*, *D. kutejensis*, and *D. oxleyanus*. These species are commonly distributed in Brunei, and together with other species like *D. testudinarius* and *D. dulcis* constitute a genetically diverse crop source.^[33]



A durian stall in Singapore

Although the durian is not native to Thailand, Thailand is ranked the world's number one exporter of durian, producing around 700,000 tonnes of durian per year, 400,000 tonnes of which are exported to China and Hong Kong.^[34] Malaysia and Indonesia follow, both producing about 265,000 tonnes each. Of this, Malaysia exported 35,000 tonnes in 1999.^[35] Chantaburi in Thailand holds the World Durian Festival in early May each year. This single province is responsible for half of the durian production of Thailand.^{[36][37]} In the Philippines, the centre of durian production is the Davao Region. The Kadayawan Festival is an annual celebration featuring the durian in Davao City.



Durian on sale near Cirebon, Indonesia

Durian was introduced into Australia in the early 1960s and clonal material was first introduced in 1975. Over thirty clones of *D. zibethinus* and six other *Durio* species have been subsequently introduced into Australia.^[38] China is the major importer, purchasing 65,000 tonnes in 1999, followed by Singapore with 40,000 tonnes and Taiwan with 5,000 tonnes. In the same year, the United States imported 2,000 tonnes, mostly frozen, and the European Community imported 500 tonnes.^[35]

Due to the increasing popularity of durian in China, the price had risen up to 20 times over in four years, in a market that was worth nearly £400m in 2018. Malaysia negotiated a deal with China to export the whole fruit frozen for the first time to China starting in 2019, previously only Thailand was permitted to export the whole fruit to China.^[39]

The durian is a seasonal fruit, unlike some other non-seasonal tropical fruits such as the papaya which are available throughout the year. In peninsular Malaysia and Singapore, the season for durians is typically from June to August, coinciding with that of the mangosteen.^[10]



Durian flesh packed for sale, with an exposed seed

Prices of durians are relatively high, compared with other fruits. For example, in Singapore the strong demand for high quality cultivars such as the D24 (*Sultan*), and Musang King (*Mao Shan Wang*) has resulted in typical retail prices of between S\$8 to S\$15 (US\$5 to US\$10) per kilogram of whole fruit in 2007.^[22] With an average weight of about 1.5 kilograms (3.3 lb), a durian fruit would therefore cost about S\$12 to S\$22 (US\$8 to US\$15).^[22] The edible portion of the fruit, known as the aril and usually referred to as the "flesh" or "pulp", only accounts for about 15–30% of the mass of the entire fruit.^[40] The increasing popularity of the fruit also saw the price of the Malaysian variety Musang King rise considerably; durian farmers

would see the prices they get increasing from two ringgit per kilogram to 60 ringgit per kilo by 2018, which made it a far more lucrative than palm oil or rubber, leading to an increase in durian plantation.^[39] Many consumers in Singapore are nevertheless quite willing to spend up to around S\$75 (US\$50) on a single purchase of about half a dozen of the favoured fruit to be shared by family members.^[22]

In-season durians can be found in mainstream Japanese supermarkets, while in the West they are sold mainly by Asian markets.



Durians being sold in mesh bags out of a freezer in a California market

Flavour and odour

The unusual flavour and odour of the fruit have prompted many people to express diverse and passionate views ranging from deep appreciation to intense disgust.^{[3][41][42]} Writing in 1856, the British naturalist Alfred Russel Wallace provided a much-quoted description of the flavour of the durian:

The five cells are silky-white within, and are filled with a mass of firm, cream-coloured pulp, containing about three seeds each. This pulp is the edible part, and its consistence and flavour are indescribable. A rich custard highly flavoured with almonds gives the best general idea of it, but there are occasional wafts of flavour that call to mind cream-cheese, onion-sauce, sherry-wine, and other incongruous dishes. Then there is a rich glutinous smoothness in the pulp which nothing else possesses, but which adds to its delicacy. It is neither acidic nor sweet nor juicy; yet it wants neither of these qualities, for it is in itself perfect. It produces no nausea or other bad effect, and the more you eat of it the less you feel inclined to stop. In fact, to eat Durians is a new sensation worth a voyage to the East to experience. ... as producing a food of the most exquisite flavour it is unsurpassed.^{[43][a]}



Sign informing that the durian fruit is not allowed inside Singapore's Mass Rapid Transit

Wallace described himself as being at first reluctant to try it because of the aroma, "but in Borneo I found a ripe fruit on the ground, and, eating it out of doors, I at once became a confirmed Durian eater".^[44] He cited one traveller from 1599:^[b] "it is of such an excellent taste that it surpasses in flavour all other fruits of the world, according to those who have tasted it."^[44] He cites another writer: "To those not used to it, it seems at first to smell like rotten onions, but immediately after they have tasted it they prefer it to all other food. The natives give it honourable titles, exalt it, and make verses on it."^[44] Despite having tried many foods that are arguably more eccentric, Andrew Zimmern, host of *Bizarre Foods*, was unable to finish a durian upon sampling it, due to his intolerance of its strong taste.

While Wallace cautions that "the smell of the ripe fruit is certainly at first disagreeable", later descriptions by Westerners are more graphic in detail. Novelist Anthony Burgess writes that eating durian is "like eating sweet raspberry *blancmange* in the lavatory".^[45] Travel and food writer Richard Sterling says:

its odor is best described as pig-shit, turpentine and onions, garnished with a gym sock. It can be smelled from yards away. Despite its great local popularity, the raw fruit is forbidden from some establishments such as hotels, subways and airports, including public transportation in Southeast Asia.^[46]

Other comparisons have been made with the civet, sewage, stale vomit, skunk spray and used surgical swabs.^[41] The wide range of descriptions for the odour of durian may have a great deal to do with the variability of durian odour itself.^{[9][47]} Durians from different species or clones can have significantly different aromas; for example, red durian (*D. dulcis*) has a deep caramel flavour with a turpentine odour while red-fleshed durian (*D. graveolens*) emits a fragrance of roasted almonds.^[3] Among the varieties of *D. zibethinus*, Thai varieties are sweeter in flavour and less odorous than Malay ones.^[10] The degree of ripeness has an effect on the flavour as well.^[10]

Phytochemicals

Hundreds of phytochemicals responsible for durian flavour and aroma include diverse volatile compounds, such as esters, ketones, alcohols (primarily ethanol), and organosulfur compounds, with various thiols.^{[47][48]} Ethyl 2-methylbutanoate had the highest content among esters in a study of several varieties.^[47] Sugar content, primarily sucrose, has a range of 8-20% among different durian varieties.^[47] Durian flesh contains

diverse polyphenols, especially myricetin, and various carotenoids, including a rich content of beta-carotene.^[47]

People in South East Asia with frequent exposures to durian are able to easily distinguish the sweet-like scent of its ketones and esters from rotten or putrescine odours which are from volatile amines and fatty acids. Some individuals are unable to differentiate these smells and find this fruit noxious, whereas others find it pleasant and appealing.^{[3][41][42]}

This strong odour can be detected half a mile away by animals, thus luring them. In addition, the fruit is highly appetising to diverse animals, including squirrels, mouse deer, pigs, sun bear, orangutan, elephants, and even carnivorous tigers.^{[49][50]} While some of these animals eat the fruit and dispose of the seed under the parent plant, others swallow the seed with the fruit, and then transport it some distance before excreting, with the seed being dispersed as a result.^[51] The thorny, armoured covering of the fruit discourages smaller animals; larger animals are more likely to transport the seeds far from the parent tree.^[52]

Ripeness and selection

According to Larousse Gastronomique, the durian fruit is ready to eat when its husk begins to crack.^[53] However, the ideal stage of ripeness to be enjoyed varies from region to region in Southeast Asia and by species. Some species grow so tall that they can only be collected once they have fallen to the ground, whereas most cultivars of *D. zibethinus* are nearly always cut from the tree and allowed to ripen while waiting to be sold. Some people in southern Thailand prefer their durians relatively young when the clusters of fruit within the shell are still crisp in texture and mild in flavour. For some people in northern Thailand, the preference is for the fruit to be soft and aromatic. In Malaysia and Singapore, most consumers prefer the fruit to be as ripe and pungent in aroma as possible and may even risk allowing the fruit to continue ripening after its husk has already cracked open. In this state, the flesh becomes richly creamy, slightly alcoholic,^[41] the aroma pronounced and the flavour highly complex.

The various preferences regarding ripeness among consumers make it hard to issue general statements about choosing a "good" durian. A durian that falls off the tree continues to ripen for two to four days, but after five or six days most would consider it overripe and unpalatable,^[3] although some Thais proceed from that point to cook it with palm sugar, creating a dessert called durian (or thurian) guan.^[54]



A customer sniffs a durian before purchasing it.

Uses

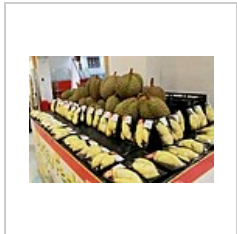
Culinary

Durian fruit is used to flavour a wide variety of sweet edibles such as traditional Malay candy, *ice kacang*, *dodol*, *lempuk*,^[55] rose biscuits, ice cream, milkshakes, mooncakes, Yule logs, and cappuccino. *Es durian* (durian ice cream) is a popular dessert in Indonesia, sold at street side stall in Indonesian cities, especially in Java. *Pulut Durian* or *ketan durian* is glutinous rice steamed with coconut milk and served with ripened durian. In Sabah, red durian is fried with onions and chilli and served as a side dish.^[56] Red-fleshed durian is traditionally added to *sayur*, an Indonesian soup made from freshwater fish.^[5] *Ikan brengkes tempoyak* is fish cooked in a durian-based sauce, traditional in Sumatra.^[57] Dried durian flesh can be made into kripik durian (durian chips).

Tempoyak refers to fermented durian, usually made from lower quality durian unsuitable for direct consumption. Tempoyak can be eaten either cooked or uncooked, is normally eaten with rice, and can also be used for making curry. Sambal Tempoyak is a Sumatran dish made from the fermented durian fruit, coconut milk, and a collection of spicy ingredients known as sambal. In Palembang, *Pangasius* catfish can be either cooked as *tempoyak ikan patin* (fish in tempoyak curry) or as *brengkes (pepes) tempoyak*, which is a steamed fermented durian paste in banana leaf container.

In Thailand, durian is often eaten fresh with sweet sticky rice, and blocks of durian paste are sold in the markets, though much of the paste is adulterated with pumpkin.^[3] Unripe durians may be cooked as a vegetable, except in the Philippines, where all uses are sweet rather than savoury. Malaysians make both sugared and salted preserves from durian. When durian is minced with salt, onions and vinegar, it is called *boder*. The durian seeds, which are the size of chestnuts, can be eaten whether they are boiled, roasted or fried in coconut oil, with a texture that is similar to taro or yam, but stickier. In Java, the seeds are sliced thin and cooked with sugar as a confection. Uncooked durian seeds are potentially toxic due to cyclopropene fatty acids and should not be ingested.^[58]

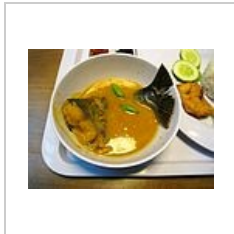
Young leaves and shoots of the durian are occasionally cooked as greens. Sometimes the ash of the burned rind is added to special cakes.^[3] The petals of durian flowers are eaten in the North Sumatra province of Indonesia, while in the Moluccas islands the husk of the durian fruit is used as fuel to smoke fish. The nectar and pollen of the durian flower that honeybees collect is an important honey source, but the characteristics of the honey are unknown.^[59]



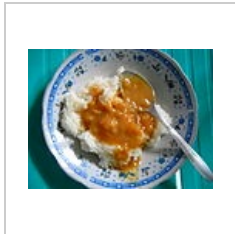
Durian market in Thailand



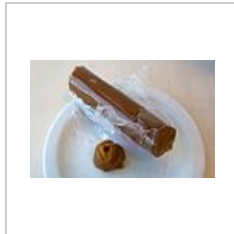
Tempoyak, made from fermented durian in Bandung, West Java, Indonesia



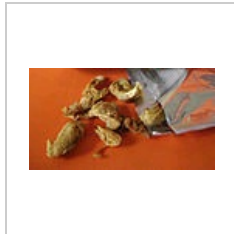
Tempoyak ikan patin, catfish in tempoyak curry, Palembang, South Sumatra, Indonesia



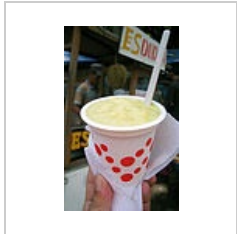
Ketan durian, glutinous rice with durian sauce in Indonesia



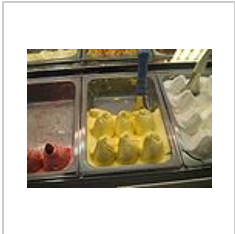
Durian cake made of durian-flavoured *dodol*, Indonesian traditional sweet candy



Keripik durian Medan (durian chips) in Medan, North Sumatra, Indonesia



A street side durian ice cream in Bogor, West Java, Indonesia



Durian *gelato* in Singapore



Durian-flavoured Yule log



Durian Keju Bollen, a pastry filled with cheese and durian cream in Bandung, West Java, Indonesia



Durian pancake in Indonesia



Durian *crêpe* in Malaysia



Durian cakes from Pontianak, West Kalimantan, Indonesia



Frozen durian from Thailand

Nutrition

Raw durian is composed of 65% water, 27% carbohydrates (including 4% dietary fibre), 5% fat and 1% protein. In 100 grams, raw or fresh frozen durian provides 33% of the Daily Value (DV) of thiamine and moderate content of other B vitamins, vitamin C, and the dietary mineral manganese (15–24% DV, table). Different durian varieties from Malaysia, Thailand and Indonesia vary in their carbohydrate content by 16-29%, fat content by 2-5%, protein content by 2-4%, dietary fibre content by 1-4%, and caloric value by 84-185 kcal per 100 grams.^[47] The fatty acid composition of durian flesh is particularly rich in oleic acid and palmitic acid.^[47]

History

The origin of the durian is thought to be in the region of Borneo and Sumatra, with wild trees in the Malay peninsula, and orchards commonly cultivated in a wide region from India to New Guinea.^[3] Four hundred years ago, it was traded across present-day Myanmar, and was actively cultivated especially in Thailand and South Vietnam.^[3]

The earliest known European reference to the durian is the record of Niccolò de' Conti, who travelled to south-eastern Asia in the 15th century.^[60] Translated from the Latin in which Poggio Bracciolini recorded de Conti's travels: "They [people of Sumatra] have a green fruit which they call durian, as big as a watermelon. Inside there are five things like elongated oranges, and resembling thick butter, with a combination of flavours."^[61] The Portuguese physician Garcia de Orta described durians in *Colóquios dos simples e drogas da India* published in 1563. In 1741, *Herbarium Amboinense* by the German botanist Georg Eberhard Rumphius was published, providing the most detailed and accurate account of durians for over a century. The genus *Durio* has a complex taxonomy that has seen the subtraction and addition of many species since it was created by Rumphius.^[18] During the early stages of its

Raw or fresh frozen durian (<i>Durio zibethinus</i>)		
Nutritional value per 100 g (3.5 oz)		
Energy	615 kJ (147 kcal)	
Carbohydrates	27.09 g	
Dietary fibre	3.8 g	
Fat	5.33 g	
Protein	1.47 g	
Vitamins	Quantity	%DV [†]
Vitamin A	44 IU	
Thiamine (B ₁)	0.374 mg	33%
Riboflavin (B ₂)	0.2 mg	17%
Niacin (B ₃)	1.074 mg	7%
Pantothenic acid (B ₅)	0.23 mg	5%
Vitamin B ₆	0.316 mg	24%
Folate (B ₉)	36 µg	9%
Vitamin C	19.7 mg	24%
Minerals	Quantity	%DV [†]
Calcium	6 mg	1%
Copper	0.207 mg	10%
Iron	0.43 mg	3%
Magnesium	30 mg	8%
Manganese	0.325 mg	15%



Michael Boym, a Jesuit missionary to China, provided one of the early (1655) reports on durian (upper right) to European scholars.

taxonomical study, there was some confusion between durian and the soursop (*Annona muricata*), for both of these species had thorny green fruit.^[62] The Malay name for the soursop is *durian Belanda*, meaning *Dutch durian*.^[63] In the 18th century, Johann Anton Weinmann considered the durian to belong to *Castaneae* as its fruit was similar to the horse chestnut.^[62]

D. zibethinus was introduced into Ceylon by the Portuguese in the 16th century and was reintroduced many times later. It has been planted in the Americas but confined to botanical gardens. The first seedlings were sent from the Royal Botanic Gardens, Kew, to Auguste Saint-Arroman of Dominica in 1884.^[64]

In south-eastern Asia, the durian has been cultivated for centuries at the village level, probably since the late 18th century, and commercially since the mid-20th century.^{[3][10]} In *My Tropic Isle*, Australian author and naturalist Edmund James Banfield tells how, in the early 20th century, a friend in Singapore sent him a durian seed, which he planted and cared for on his tropical island off the north coast of Queensland.^[65]

In 1949, the British botanist E. J. H. Corner published *The Durian Theory, or the Origin of the Modern Tree*. His theory was that endozoochory (the enticement of animals to transport seeds in their stomach) arose before any other method of seed dispersal, and that primitive ancestors of *Durio* species were the earliest practitioners of that dispersal method, in particular red durian (*D. dulcis*) exemplifying the primitive fruit of flowering plants. However, in more recent circumscriptions of Durioneae, the tribe into which *Durio* and its sister taxa fall, fleshy arils and spiny fruits are derived within the clade. Some genera possess these characters, but others do not. The most recent molecular evidence (on which the most recent, well-supported circumscription of Durioneae is based) therefore refutes Corner's Durian Theory.^[12]

Since the early 1990s, the domestic and international demand for durian in the Association of Southeast Asian Nations (ASEAN) region has increased significantly, partly due to the increasing affluence of Asia.^[10]

Culture and folk medicine

Cultural influences

A common local belief is that the durian is harmful when eaten with coffee^[41] or alcoholic beverages.^[10] The latter belief can be traced back at least to the 18th century when Rumphius stated that one should not drink alcohol after eating durians as it will cause indigestion and bad breath. In 1929, J. D. Gimlette wrote in his *Malay Poisons and Charm Cures* that the durian fruit must not be eaten with brandy. In 1981, J. R. Croft wrote in his *Bombacaceae: In Handbooks of the Flora of Papua New Guinea* that "a feeling of morbidity" often follows the consumption of alcohol too soon after eating durian. Several medical investigations on the validity of this belief have been conducted with varying conclusions,^[10] though a study by the University of Tsukuba finds the fruit's high sulphur content inhibits the activity of aldehyde dehydrogenase, causing a 70 percent reduction of the ability to clear toxins from the body.^[66]



Durian fruit is armed with sharp thorns, capable of drawing blood.

The durian is commonly known as the "king of fruits",^[5] a label that can be attributed to its formidable look and overpowering odour.^[67] In its native south-eastern Asia, the durian is an everyday food and portrayed in the local media in accordance with the cultural perception it has in the region. The durian symbolised the subjective nature of ugliness and beauty in Hong Kong director Fruit Chan's 2000 film *Durian Durian* (榴飄飄, *lau lin piu piu*), and was a nickname for the reckless but lovable protagonist of the eponymous Singaporean TV comedy *Durian King* played by Adrian Pang.^[68] Likewise, the oddly shaped Esplanade building in Singapore (Theatres on the Bay) is often called "The Durian" by locals,^[68] and "The Big Durian" is the nickname of Jakarta, Indonesia.^[69]

A durian falling on a person's head can cause serious injuries because it is heavy, armed with sharp thorns, and can fall from a significant height. Wearing a hardhat is recommended when collecting the fruit. Alfred Russel Wallace writes that death rarely ensues from it, because the copious effusion of blood prevents the inflammation which might otherwise take place.^[43] A common saying is that a durian has eyes and can see where it is falling because the fruit allegedly never falls during daylight hours when people may be hurt which is untrue as people have died from durian falling on their heads especially young children.^{[70][71]} A saying in Indonesian, *ketiban durian runtuh*, which translates to "getting hit by a durian", is the equivalent of the English phrase "windfall gain".^[72] Nevertheless, signs warning people not to linger under durian trees are found in Indonesia.^[73] Strong nylon or woven rope netting is often strung between durian trees in orchards, serving a threefold purpose: the nets aid in the collection of the mature fruits, deter ground-level

Phosphorus	39 mg	6%
Potassium	436 mg	9%
Sodium	2 mg	0%
Zinc	0.28 mg	3%

Other constituents	Quantity
Water	65 g

Link to Full Report from the (<https://ndb.nal.usda.gov/ndb/foods/show/2425?fgcd=&man=&facet=&count=&max=35&sort=&qlookup=durian&offset=&format=Full&new=&measureby=>)USDA National Nutrient Database

Units
µg = micrograms • mg = milligrams
IU = International units
*Percentages are roughly approximated using US recommendations for adults.



Durio zibethinus. Chromolithograph by Hoola Van Nooten, circa 1863



Singapore's Esplanade building, nicknamed "The Durian"



Pusat Sains Negara, Kuala Lumpur

scavengers, and prevent the durians from falling onto people.

A naturally spineless variety of durian growing wild in Davao, Philippines, was discovered in the 1960s; fruits borne from these seeds also lacked spines.^[10] Since the bases of the scales develop into spines as the fruit matures, sometimes spineless durians are produced artificially by scraping scales off immature fruits.^[10] In Malaysia, a spineless durian clone D172 is registered by Agriculture Department on 17 June 1989. It was called "Durian Botak" ('Bald Durian').^[25] In Indonesia, Ir Sumeru Ashari, head of Durian Research Centre, Universitas Brawijaya reported spineless durian from Kasembon, Malang. Another cultivar is from Lombok, Nusa Tenggara Barat, Indonesia.

Animals such as Sumatran elephants and tigers are known to consume durians.^[50]

One of the names Thailand contributed to the list of storm names for Western North Pacific tropical cyclones was 'Durian',^[74] which was retired after the second storm of this name in 2006. Being a fruit much loved by a variety of wild beasts, the durian sometimes signifies the long-forgotten animalistic aspect of humans, as in the legend of Orang Mawas, the Malaysian version of Bigfoot, and Orang Pendek, its Sumatran version, both of which have been claimed to feast on durians.^{[75][76]}

Folk medicine

In Malaysia, a decoction of the leaves and roots used to be prescribed as an antipyretic. The leaf juice is applied on the head of a fever patient.^[3] The most complete description of the medicinal use of the durian as remedies for fevers is a Malay prescription, collected by Burkill and Haniff in 1930. It instructs the reader to boil the roots of *Hibiscus rosa-sinensis* with the roots of *Durio zibethinus*, *Nephelium longan*, *Nephelium mutabile* and *Artocarpus integrifolia*, and drink the decoction or use it as a poultice.^[77]

Southeast Asian traditional beliefs, as well as traditional Chinese medicine, consider the durian fruit to have warming properties liable to cause excessive sweating.^[78] The traditional method to counteract this is to pour water into the empty shell of the fruit after the pulp has been consumed and drink it.^[41] An alternative method is to eat the durian in accompaniment with mangosteen, which is considered to have cooling properties. Pregnant women or people with high blood pressure are traditionally advised not to consume durian.^{[27][79]}

The Javanese believe durian to have aphrodisiac qualities, and impose a set of rules on what may or may not be consumed with it or shortly thereafter.^[41] A saying in Indonesian, *durian jatuh sarung naik*, meaning "the durian falls and the sarong comes up", refers to this belief.^[80] The warnings against the supposed lecherous quality of this fruit soon spread to the West — the Swedenborgian philosopher Herman Vetterling commented on so-called "erotic properties" of the durian in the early 20th century.^[81]

Environmental impact

The increased demand for durians in China has prompted a shift in Malaysia from small-scale durian orchards to large-scale industrial operations, with forests being cleared to make way for large durian plantations.^[82]

See also

- Breadfruit
- Jackfruit
- List of delicacies
- List of durian diseases and pests

Notes

- a. ^ Wallace makes an almost identical comment in his 1866 publication *The Malay Archipelago: The land of the orang-utang and the bird of paradise*.^[44]
- b. ^ The traveller Wallace cites is Linschott (Wallace's spelling for Jan Huyghen van Linschoten), whose name appears repeatedly in Internet searches on durian, with such citations themselves tracing back to Wallace. In translations of Linschoten's writings, the fruit is spelled as *duryoen*.^[83]

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