

Noni

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For other uses, see [Noni \(disambiguation\)](#).

Great morinda, Noni



Leaves, flowers, and fruit of *Morinda citrifolia*

Scientific classification

Kingdom: [Plantae](#)
Division: [Magnoliophyta](#)
Class: [Magnoliopsida](#)
Order: [Gentianales](#)
Family: [Rubiaceae](#)
Genus: [Morinda](#)
Species: *M. citrifolia*

Binomial name

Morinda citrifolia
[L.](#)



Fruit of *Morinda citrifolia* in [Honolulu](#)

Morinda citrifolia, commonly known as **great morinda**, **Indian mulberry**, **beach mulberry**, **Tahitian noni**, **cheese fruit**^[1] or **noni** (from [Hawaiian](#)) is a tree in the family [Rubiaceae](#). *Morinda citrifolia* is native to [Southeast Asia](#) but has been extensively spread throughout the [Indian subcontinent](#) and [Pacific islands](#) as far as [French Polynesia](#) of which [Tahiti](#) is the most prominent growing location.

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[[edit](#)] Growing habitats

Noni grows in shady forests as well as on open rocky or sandy shores. It reaches maturity in about 18 months and then yields between 4-8 kg of fruit every month throughout the year. It is tolerant of [saline](#) soils, drought conditions, and [secondary soils](#). It is therefore found in a wide variety of habitats: [volcanic](#) terrains, [lava](#)-strewn [coasts](#), and clearings or [limestone](#) outcrops. It can grow up to 9 m tall, and has large, simple, dark green, shiny and deeply veined leaves.

The plant [flowers](#) and fruits all year round and produces a small white flower. The fruit is a [multiple fruit](#) that has a pungent odor when ripening, and is hence also known as *cheese fruit* or even *vomit fruit*. It is oval and reaches 4-7 cm in size. At first green, the fruit turns yellow then almost white as it ripens. It contains many [seeds](#). It is sometimes called starvation fruit. Despite its strong smell and bitter taste, the fruit is nevertheless eaten as a [famine food](#)^[2] and, in some [Pacific islands](#), even a staple food, either raw or cooked.^[3] [Southeast Asians](#) and [Australian Aborigines](#) consume the fruit raw with salt or cook it with [curry](#). The seeds are edible when roasted.

The noni is especially attractive to [weaver ants](#), which make nests out of the leaves of the tree. These ants protect the plant from some plant-parasitic insects. The smell of the fruit also attracts [fruit bats](#), which aid in dispersing the seeds.

[[edit](#)] Nutrients

Nutritional information for noni fruit is reported by the College of Tropical Agriculture, [University of Hawaii](#) at [Mānoa](#) who published analyses of fruit powder and pure juice.

[[edit](#)] Macronutrients

Analyzed as a whole fruit powder^[4], noni fruit has excellent levels of [carbohydrates](#) and [dietary fiber](#), providing 55% and 100% of the [Dietary Reference Intakes](#) (DRI), respectively, in a 100 g serving. A good source of [protein](#) (12% DRI), noni pulp is low in total [fats](#) (4% DRI)].

These macronutrients evidently reside in the *fruit pulp*, as noni *juice* has sparse amounts of macronutrients^[5].

[[edit](#)] Micronutrients

The main micronutrient features of noni pulp powder include exceptional [vitamin C](#) content (10x DRI) and substantial amounts of [niacin](#) (vitamin B3), [iron](#) and [potassium](#)^[6]. [Vitamin A](#), [calcium](#) and [sodium](#) are present in moderate amounts.

When noni juice alone is analyzed and compared to pulp powder, only vitamin C is retained at a high level, 42% of DRI.

Nutrient analyses for a major brand of noni juice (Tahitian Noni Juice, TNJ) were published in 2002 by the Scientific Committee on Food of the European Commission on Health and Consumer Protection^[7] during a test for public safety of TNJ. TNJ ingredients include noni [purée](#) and juice concentrates from [grapes](#) and [blueberries](#).

For antimicrobial purposes, TNJ must be subjected to the high temperatures of [pasteurization](#) which essentially nullifies most of the nutrient content of the natural purée.

Excepting vitamin C content at 31% of DRI in each 100g, TNJ has limited nutritional content. 100g of juice provides 8% of the DRI for carbohydrates, only traces of other macronutrients and low or trace levels of 10 essential vitamins, 7 essential [dietary minerals](#) and 18 [amino acids](#).

Although the most significant nutrient feature of noni pulp powder or juice is its high vitamin C content, this level in TNJ provides only about half the vitamin C of a raw [navel orange](#)^[8]. Sodium levels in TNJ (about 3% of DRI) are multiples of those in an orange. Although the potassium content appears relatively high for noni, this total is only about 3% of the [Recommended Dietary Allowance](#) and so would not be considered excessive. TNJ is otherwise similar in micronutrient content to a raw orange^[9].

[[edit](#)] Phytochemicals

The history of published medical research on noni [phytochemicals](#) numbers only around a total of 120 reports which began appearing in the 1950s. Just since 2000, over 100 publications on noni have been published in medical literature (reviewed in August 2007), defining a relatively young research field. Noni research is at a preliminary stage, as it is mainly still in the laboratory as [in vitro](#) or basic animal experiments.

Noni fruit contains phytochemicals for which there are no established DRI values. Examples:

- [lignans](#) - a group of [phytoestrogens](#) having biological activities shown by in vitro experiments^{[10][11][12]}
- oligo- and [polysaccharides](#) – long-chain sugar molecules that serve a [prebiotic](#) function as [dietary fiber](#) fermentable by [colonic bacteria](#), yielding [short chain fatty acids](#) with numerous potential health properties not yet defined by scientific research on noni
- [flavonoids](#) – phenolic compounds such as rutin and asperulosidic acid, common in several [Rubiaceae](#) plants
- [iridoids](#) - secondary metabolites found in many plants
- trisaccharide fatty acid [esters](#), "noniosides" - resulting from combination of an alcohol and an acid in noni fruit
- free [fatty acids](#) - most prominent in noni fruit are [caprylic](#) and [hexanoic](#) acids, responsible for unique pungent (cheese-like) aroma of ripe noni fruit^[13]
- scopoletin – may have antibiotic activities; research is preliminary
- [catechin](#) and epicatechin^[14]
- [beta-sitosterol](#) – a plant [sterol](#) with potential for anti-[cholesterol](#) activity not yet proven in human research
- damnacanthal – a potentially toxic [anthraquinone](#), putatively an inhibitor of [HIV](#) viral proteins
- [alkaloids](#) – naturally occurring amines from plants. Some internet references mention xeronine or proxeronine as important noni constituents. However, as no reports on either of these substances exist in published medical literature, the terms are scientifically unrecognized. Further, chemical analysis of commercially processed *juice* did not reveal presence of any alkaloids.^[15]

Although there is evidence from in vitro studies and laboratory models for [bioactivity](#) of each of the above phytochemicals, the research remains at best preliminary and too early to conclude anything about human health benefits provided by noni or its juice. Furthermore, these phytochemicals are not unique to noni, as nearly all exist in various plant foods.

Laboratory experiments demonstrated that dietary noni juice increased physical endurance in mice.^[16] A [pilot study](#) in distance runners showed increased endurance capacity following daily intake of noni juice over three weeks, an effect the authors attributed to increased antioxidant status.^[17]

[\[edit\]](#) Uses



Wild noni growing in [Kuliouou Valley](#), Hawaii

Although noni's reputation for uses in [folk medicine](#) extends over centuries^[18], no medical applications as those discussed below have been verified by modern science.

In [China](#), [Samoa](#), [Japan](#), and [Tahiti](#), various parts of the tree (leaves, flowers, fruits, bark, roots) serve as tonics and to contain [fever](#), to treat [eye](#) and [skin](#) problems, [gum](#) and [throat](#) problems as well as [constipation](#), [stomach](#) pain, or [respiratory](#) difficulties.^[*citation needed*] In [Malaysia](#), heated noni leaves applied to the [chest](#) are believed to relieve [coughs](#), [nausea](#), or [colic](#).^[*citation needed*]

The noni fruit is taken, in [Indochina](#) especially, for [asthma](#), [lumbago](#), and [dysentery](#).^[*citation needed*] As for external uses, unripe fruits can be pounded, then mixed with [salt](#) and applied to cut or broken [bones](#).^[*citation needed*] In Hawaii, ripe fruits are applied to draw out [pus](#) from an infected boil. The green fruit, leaves and the root/rhizome have traditionally been used to treat menstrual cramps and irregularities, among other symptoms, while the root has also been used to treat urinary difficulties.^[18]

The bark of the great morinda produces a brownish-purplish [dye](#) for [batik](#) making; on the [Indonesian](#) island of [Java](#), the trees are cultivated for this purpose. In [Hawaii](#), yellowish dye is extracted from its root in order to dye cloth.^[19] The fruit is used as a shampoo in Malaysia, where it is said to be helpful against [head lice](#).^[*citation needed*]

There have been recent applications also for the use of oil from noni seeds.^[*citation needed*] Noni seed oil is abundant in [linoleic acid](#) that may have useful properties when applied topically on

skin, e.g., anti-inflammation, acne reduction, moisture retention.^{[20] [21] [22]}

In [Surinam](#) and some other countries, the tree serves as a wind-break, as support for [vines](#) and as shade for [coffee](#) trees.

[\[edit\]](#) See also

- [Noni juice](#)

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[[edit](#)] Further reading

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