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## PHILIPPINE MEDICINAL PLANTS

**Family** • Arecaceae

# Nipa

**SASA**

*Nypa fruticans* Wurmbr.

**NIPA PALM**

Shui ye

| Scientific names                                      | Common names       |
|---|--------------------|
| <i>Cocos nypa</i> Lour.                               | Anipa (Ibn.)       |
| <i>Nypa arborescens</i> Wurmbr. ex H.Wendl.           | Lasa (Tag.)        |
| <i>Nypa fruticans</i> (Wurmbr.) Thunb.                | Nipa (S.-Fil.)     |
| <i>Nypa littoralis</i> Blanco                         | Pawid (Tag.)       |
| <i>Nypa fruticans</i> Wurmbr.                         | Pawid (Tag.)       |
| <i>Nypa fruticans</i> var. <i>neameana</i> F.M.Bailey | Pinog (It.)        |
|   | Pinok (Ibn.)       |
|   | Saga (Sbl.)        |
|   | Sasa (Pamp., Tag.) |
|   | Tata (Ibn.)        |
|   | Nipa palm (Engl.)  |

*Nypa fruticans* Wurmbr. is an accepted name [The Plant List](#)

### Other vernacular names

BANGLADESH: Golpata.

CHINESE: Lu bi, Zhu zi, Shui ye.

FRENCH: Palmier des marais, Palmier des marécages, Palmier nipa, Palmier d'eau.

GERMAN: Attapalme, Mangrovenpalme, Nipapalme, Nypa-Palme.

ITALIAN: Palma delle paludi.

JAPANESE: Nippa yashi, Nippayasi.

PALAUAN: Toechel.

POHNPEIAN: Parem.

RUSSIAN: Nipa

THAI: Chaak, Lukchaak.



### **Gen info**

The nipa palm is one of the most important economic Philippine crops. It differs from most palm in the lack of an upright stem, trunkless, developing inflorescences at 1 meter height. The leaves are commonly use for thatching. Leaflets are used for making hats, baskets, mats, raincoats, wrappings for suman. The midribs are used for making brooms; the petioles for fuel.

### **Botany**

Nipa is a monoecious palm, with stout, subterranean, trunkless and thornless rootstock. Leaves are at the ends of the rootstocks, large, rosette and compound, 5 to 10 meters long, arising from the stout underground stem (rhizome). Leaflets are numerous, rigid, lanceolate, up to 1 meter long, 2 to 7 cm centimeters wide. Male inflorescence is brown, erect, up to 1 meter high. Female inflorescence is stout, 1 meter high or less. Fruit is globose, nodding, up to 30 centimeters in diameter. Carpels are numerous, dark-brown, striate, smooth, 10 to 14 centimeters long, compressed, obovate. Seeds are hard, white, and as large as a hen's egg.

### **Distribution**

- Along tidal streams in brackish swamps and muddy banks throughout the Philippines.
- Gregarious over large areas of favorable habitats.
- Also occurs in India, through Malaya to tropical Australia.

### **Constituents**

- Fermented nipa sap contains high amount of ethanol, together with higher alcohols, esters, diacetyl, and acetoin.
- Proximate analyses of husk showed moisture ( $65.14 \pm 0.04\%$  DM), fat ( $1.5 \pm 0.13\%$  DM), crude protein ( $2.00 \pm 0.64\%$  DM), fiber ( $2.47 \pm 0.09\%$  DM), ash ( $4.20 \pm 0.14\%$  DM), carbohydrate ( $24.63 \pm 0.17\%$  DM). The seeds contained moisture ( $41.96 \pm 0.28\%$  DM), fat ( $0.94 \pm 0.01\%$  DM), crude protein ( $1.27 \pm 0.01\%$  DM), fiber ( $2.50 \pm 0.19\%$  DM), ash ( $2.7 - 0.11\%$  DM), and carbohydrate ( $51.0 \pm 1.71\%$ DM). (19)
- Toxicant composition of husk yielded (mg/100g DM) hydro cyanide ( $0.63 \pm 0.02$ ), oxalate ( $6.50 \pm 0.025$ ), and phytate contents ( $4.03 \pm 0.09$ ). Seeds yielded  $0.08 \pm 0.01$ ,  $9.90 \pm 0.08$  and  $8.50 \pm 0.64$  mg/100g DM of hydrocyanide, oxalate, and phytate, respectively. (19)
- Mineral analysis yielded potassium of  $147.28 \pm 0.65$  mg/100g DM for the husk and  $128.52 \pm 0.6$  mg/100g DM for the seeds. Vitamin A content was higher in the seeds than the husk. (19)

## Properties

- Sap is highly fermentable.
- Fresh sap has a sweet and fruit-like odor.

## Parts used

Roots, shoots, sap, and leaves.

## Uses

### Edibility

- Young seeds are edible.
- Nipa is a source of alcohol, sugar and vinegar.
- The fermented juice, tuba, is extensively used as beverage.

### Folkloric

- Decoction of fresh leaves used for indolent ulcers.
- In **Malaya**, the juice of young shoots, with coconut milk, used as a drink for treating herpes.
- Ash of roots and leaves used for headaches and toothaches.
- Fresh leaves, in cataplasm or lotion form, used for treatment of ulcers.
- The fermented sap diluted with water used as eyewash in eyelid and conjunctival inflammations.
- In traditional Malay medicine, nipa palm vinegar used for diabetes.
- In **Bangladesh**, used as a tonic and stimulant for debility.

### Others

- Leaves are one of the most commonly used material for thatching.
- Leaflets are used for making hats, raincoats, baskets, bags, mats, *suman* wrappers.
- Midribs used for making brooms.
- Petioles used for fuel.
- Nipa is a source of alcohol ([sasa lambanog](#)), vinegar and sugar.



## Studies

- **Zinc Corrosion Inhibition:** Study showed *Nypa fruticans* leaves extract and DPC (diphenyl carbazone) inhibit the corrosion of zinc comparatively, possibly through the protonation of the hydrogen evolution process or formation of a soluble complex on zinc surface by molecules of *N. fruticans* or DPC. (5)
- **Antioxidant Capacity:** Evaluation for antioxidant capacity showed total phenolic and flavonoid content of immature fruits were higher than mature fruits. The immature fruits showed a high DPPH radical scavenging activity and antioxidant capacity, even higher than BHT and mature fruits. (6)
- **Ethanol Production from Sap:** Study evaluated the production of ethanol from the sap. With its incredibly high sugar-rich sap yield, researchers estimated 15,000 to 20,000 liters of biofuel yield per hectare (compared with sugar cane at 5000-8000 liters, and corn at 2,000 liter), on a continuing basis, year-round, for up to 50 years.
- **Biology and Sap Yield Estimate:** An April-May 2009 survey done in the Philippines to study the biology of nipa with emphasis on potential for alcohol production showed the estimates of sap yield to be much lower than the ones reported in literature. (10)
- **Biofuel Energy:** Study evaluated the optimum bacterial concentration for fermentation to produce high concentration of bio-fuel. Results showed the highest yield of bio-ethanol (8.98%) was produced with 7.5% of starter concentration and 6 days of incubation time. (9)
- **Phenolics and Flavonoid Content / Antioxidant Capacity:** Study evaluated endosperm extracts of ripe and unripe fruits for total phenolics, flavonoid content, and antioxidant capacities. Endosperm

extract of unripe fruits (EEU) exhibited the highest phenolics ( $135.6 \pm 4.5$  GAE/g), flavonoid content ( $68.6 \pm 3.1$  RE/g), and antioxidant capacity. The extract also showed radical scavenging activity by DPPH assay and high antioxidant capacity by phosphomolybdenum method and ferric reducing antioxidant power values. Chlorogenic acid, protocatechuic acid, and kaempferol were the major phenolic compounds. (12)

• **Anti-Diabetic / Antioxidant / Nipa Palm Vinegar:** Study evaluated the antidiabetic and antioxidant activities of nipa palm vinegar in normal and STZ-induced diabetic rats. Results showed an aqueous extract of NPV to possess antihyperglycemic activities comparable to metformin, while an ethyl acetate extract precipitated significant antioxidant effects attributable to its high phenolic contents. (14) Study evaluated the effect of an aqueous extract of nipa palm vinegar (NPV) on postprandial hyperglycemia. Results showed an antidiabetic effect and with delayed glucose absorption in isolated rat jejunum, suppression of postprandial hyperglycemia, weak inhibitory activity against both  $\alpha$ -glucosidase and  $\alpha$ -amylase activities. (20)

• **Antimicrobial / Midvein, Leaves and Husks:** Study evaluated various extracts of *Nypa fruticans* against *E. coli*, *K. pneumonia*, *S. aureus*, *S. epidermis* and *P. aeruginosa*. Aqueous and ethanolic extracts of midveins, leaves, and husks showed good antimicrobial activity against all the test organisms. (16)

• **Antihyperglycemic / Antinociceptive / Leaf and Stem:** Study evaluated the anti-hyperglycemic and antinociceptive potential of methanolic extract of leaf and stem. Results showed significant oral anti-hyperglycemic activity on glucose loaded mice, with maximum effect observed at 500 mg MENF/kbw, better than that observed with standard drug glibenclamide. Significant antinociceptive activity was demonstrated by MENF in acetic acid induced writhing mice model, at 600 mg/kbw was better than that obtained with aspirin. (18)

### Availability

- Wildcrafted.
- Cultivated.

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