

Moringa

This article is about the genus *Moringa*. *Moringa* is also the common name of a particular species, *Moringa oleifera*.

Moringa, native to parts of Africa and Asia, is the sole genus in the flowering plant family **Moringaceae**. The name is derived from *murungai/muringa*, the Tamil/Malayalam word for drumstick. It contains 13 species from tropical and subtropical climates that range in size from tiny herbs to massive trees.

The most widely cultivated species is *Moringa oleifera*, a multipurpose tree native to the foothills of the Himalayas in northwestern India^[4] and cultivated throughout the tropics.^[5] *M. stenopetala*, an African species, is also widely grown, but to a much lesser extent than *M. oleifera*.

Moringa species grow quickly in many types of environments.

1 Nutritional content

Much of the plant is edible by humans or by farm animals. The leaves are rich in protein, vitamin A, vitamin B, vitamin C, and minerals.^[5] A 100-g portion of fresh moringa leaves has 9.3 g protein, 434 mg calcium, 404 mg potassium, 738 µg vitamin A, and 164 mg vitamin C.^[6]

Feeding the high-protein leaves to cattle has been shown to increase weight gain by up to 32% and milk production by 43 to 65%.^[7] The seeds contain 30 to 40% oil that is high in oleic acid, while degreased meal is 61% protein.^[8] The defatted meal is a flocculant and can be used in water purification to settle out sediments and undesirable organisms.^[9]

2 Farming worldwide

Moringa cultivation is on the rise in Honduras and all across South America. Claims are made that it is a profitable means of combating deforestation, but *Moringa* species are not native to the forests of the New World. As of 2012, support for *Moringa* farmers is being offered by the Honduran federal government through the Secretary of Agriculture and by private foreign investment firms. The plant's market potential is widespread given its easy growth and high nutrient content. As described below, the plant is valued for its leaves and high-



Moringa oleifera (seedpods), Maui, Kahului

protein seeds. It can also be made into defatted meal. *M. oleifera* silviculture is being promoted as a means to combat poverty and malnutrition.^[7]

M. oleifera is being cultivated in poverty-stricken nations, such as Niger, as a primary source of food and nutrients,^[10] and a source of income through sales due to widespread and global marketability.^[11]

In Haiti, moringa is planted as a windbreak and to reduce soil erosion. The trees provide many products from oil to soil amendments (fertilizers) and tisanes made from the leaves.

In Mexico, Reserva Las Estacas, in Morelos, includes the cultivation of moringa.^{[12][13]}

3 Biodiesel

Moringa is considered a potential oilseed feedstock for biodiesel.^[14] Its main advantage is that biofuel produced from it is not in direct competition with food, as the plant produces both biofuel feedstock (seeds) and food (leaves) independently.^[14] *Moringa* seeds contain 30 to 40% oil that is high in oleic acid.^[14] Its biodiesel has better oxidative stability than biodiesel made from most other feedstocks.^[14] Leaves and seeds can be harvested from mature trees without damaging them.

4 List of species

- *Moringa arborea* Verdc. (Kenya)

- *Moringa borziana* Mattei
- *Moringa concanensis* Nimmo
- *Moringa drouhardii* Jum. – bottle tree (southwestern Madagascar)
- *Moringa hildebrandtii* Engl. – Hildebrandt’s moringa (southwestern Madagascar)
- *Moringa longituba* Engl.
- *Moringa oleifera* Lam. (syn. *M. pterygosperma*) – horseradish tree (northwestern India)
- *Moringa ovalifolia* Dinter & Berger
- *Moringa peregrina* (Forssk.) Fiori ^[15]
- *Moringa pygmaea* Verdc.
- *Moringa rivae* Chiov.
- *Moringa ruspoliana* Engl.
- *Moringa stenopetala* (Baker f.) Cufod. ^{[16][17]}

5 References

- [1] Angiosperm Phylogeny Group (2009). “An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG III” (PDF). *Botanical Journal of the Linnean Society* **161** (2): 105–121. doi:10.1111/j.1095-8339.2009.00996.x. Retrieved 2013-07-06.
- [2] “Genus: *Moringa* Adans.”. *Germplasm Resources Information Network*. United States Department of Agriculture. 1996-09-17. Retrieved 2011-09-26.
- [3] "*Moringa* Adans.”. *TROPICOS*. Missouri Botanical Garden. Retrieved 2009-12-30.
- [4] Olson, Mark (2010). “Moringaceae Martinov. Drumstick Tree Family”. *Flora of North America*. 1993+. Flora of North America North of Mexico. **7**: 167–169.
- [5] Janick, Jules; Robert E. Paull (2008). *The Encyclopedia of Fruit & Nuts*. CABI. pp. 509–510. ISBN 978-0-85199-638-7.
- [6] “West African Food Composition Table”. Retrieved 2012-11-01.
- [7] “The Moringa Tree *Moringa oleifera*”. Trees for Life International. Retrieved 2009-12-29.
- [8] Schill, Susanne Retka (2008-05-14). “Multidimensional Moringa”. *Biodiesel Magazine*. Retrieved 2011-09-26.
- [9] Schwarz, Dishna (June 2000). “Water Clarification using *Moringa oleifera*”. *Technical Information W1e* (Gate Information Service). Retrieved 2011-09-26.
- [10] Ginny Stein (12 July 2012). “Miracle Tree helps in Niger’s food crisis”. Australia: The World Today/ABC News. Retrieved 13 August 2013.
- [11] Annette Frost (3 July 2012). “Moringa: The Tree of Life”. The Huffington Post. Retrieved 13 August 2013.
- [12] Reserva Las Estacas, Morelos, Mexico (in Spanish)
- [13] Agrin, A.C., a civil association related to Reserva Las Estacas
- [14] Schill, Susanne Retka. “Multidimensional Moringa”. *Biodiesel Magazine*. Retrieved 7 September 2013.
- [15] Dadamouny, M.A. (2009). “Population Ecology of *Moringa peregrina* growing in Southern Sinai, Egypt.”. *M.Sc.* Suez Canal University, Faculty of Science, Botany Department. Retrieved 2009-12-26.
- [16] “Subordinate Taxa of *Moringa* Adans.”. *TROPICOS*. Missouri Botanical Garden. Retrieved 2009-12-30.
- [17] Dadamouny, M.A., Zaghoul, M.S., & Moustafa, A.A. (2012). “Impact of Improved Soil Properties on Establishment of *Moringa peregrina* seedlings and trial to decrease its Mortality Rate.”. *Case Study*. Egyptian Journal of Botany, NIDOC. Retrieved 2012-07-03.

6 External links

- Mark Olson’s Moringa Home Page: Photos and information on all 13 species
- Mark Olson’s Moringa blog - information on frequently asked Moringa questions
- The Magic Tree: Info about moringa in different languages
- Purdue University: Moringa oleifera
- Trees for Life Moringa Site

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