

Technical Bulletin #92:

Chaya – High Nutrition Perennial

Chaya grows easily in Cambodia

Chaya (*Cnidoscolus chayamansa* or *C. aconitifolius*) is a perennial plant that grows easily throughout Cambodia. Many people know it by the name “spinach tree”. If left alone, a Chaya plant can grow to be a small tree about 4-5m high. By pruning the plant, it grows to be a bushy shrub about 1.5-2m high. This is what many people do when they grow Chaya as a “living fence” around their gardens and elsewhere on their land.



Chaya is rich in essential nutrients

Chaya leaves are an excellent source of a number of essential nutrients for a healthy, balanced diet. In fact, Chaya is more nutritious than many green leafy vegetables such as spinach, Chinese cabbage and amaranth. The leaves are very high in protein, calcium, iron and vitamins A and C. The precise nutritional value of Chaya depends on the cultivar. The following table summarizes the range of nutrition values found in a 100g serving of Chaya, and the percentages of recommended daily intakes of key nutrients.

Nutritional Values for Chaya (100g serving)			
	Actual Quantities	% Daily Value	Why Eat Chaya?
Protein	6.2 - 7.4 g	12-15%	Protein builds muscles. One serving of Chaya has the same amount protein as an egg.
Calcium	200 - 330 mg	20-33%	Calcium builds strong bones. Chaya has more calcium than any other vegetable.
Iron	9.3 - 11.4 mg	42-52%	Iron is good for healthy blood and more energy. Chaya has two times the iron as spinach.
Vitamin A	1,357 IU	27%	Vitamin A prevents night blindness and protects the body against infections.
Vitamin C	165 - 205 mg	275-342%	Vitamin C builds strong bones, protects against infections and helps the body absorb iron.
Sources: Nature's Solution to Malnutrition. www.MiraclesInAction.org (accessed 13 May 2013). Pacific Islands Farm Manual, Tropical Perennial Vegetable Leaflet No. 4, August 1994.			

Building Chaya into your diet

Young leaves and the thick, tender stem tips are the parts of the Chaya plant that people eat, although the older leaves can also be cooked and eaten.

- In general, Chaya leaves are boiled in the same way as spinach.

- The leaves have a bland taste so they can be easily added to many foods such as soups, mixed vegetable dishes and omelets without changing the taste of these dishes.
- Add pre-cooked, finely chopped Chaya to *bobor* to enrich it with protein and vitamins, as a complementary food for infants from 6 to 24 months of age.
- Stir frying Chaya leaves with onions, garlic and chili peppers is another way to make an easy, nutritious dish.
- Or add chopped, cooked Chaya leaves to rice just before it finishes cooking, to add nutrients to this staple dish.

Always cook Chaya leaves. Do not eat uncooked leaves. Raw Chaya leaves contain hydrocyanic glucoside, a toxic substance that can make you sick. However, cooked leaves are safe to eat – by cooking the leaves the toxic substance is released as a harmless gas. Young, tender leaves are safe when they have been boiled or fried for at least 5 minutes. Older, tougher leaves should be boiled for 10-15 minutes. For many dishes that cook quickly, it is important to pre-cook the Chaya leaves before using them. This is not necessary when using Chaya leaves in a soup or other dish that cooks for a longer period.

When you boil Chaya leaves, much of the vitamin C ends up in the cooking water. Do not throw this away as it is a good source of nutrients. Add the cooking water to soups. Or, drink it like a tea. Because the leaves have been boiled, the liquid is safe to use or drink.

Cultivating, harvesting and pruning Chaya

Chaya is very easy to grow. It is propagated from stem cuttings, not seeds. Cut woody sections of Chaya stems that are 20-30 cm long and contain 2-3 nodes. These cuttings can be taken from the top or bottom portion of the stem, although cuttings from the top portion tend to have fewer problems with rotting during the rooting process. Remove leaves and air dry the cuttings in the shade for 3-4 days. This will allow the cut ends to seal and make them less susceptible to rotting.



Plant the cuttings in 10-12 cm of soil, either in pots or nursery containers, or directly in the ground. Be sure that 1-2 nodes on the cutting stem are beneath the soil. The cuttings – either in the ground or in containers – should be in an area that gets plenty of sun. Water the cuttings to keep the soil moist until roots form, but do not waterlog the plants.

Cuttings are ready to transplant when mature leaves are produced. Transplanting is best done at the beginning of the rainy season to promote high survival and good growth. Water the seedlings thoroughly before transplanting, and place them in planting holes that are deep enough to allow the roots to hang vertically. Add compost in the planting hole to provide needed nutrients for good establishment. Pack soil firmly around the transplanted seedling and place rice straw or other mulch around the plant to reduce the loss of soil moisture and help to control weeds.

To form a dense hedge or living fence, Chaya seedlings should be spaced about 60 cm apart. For commercial production, rows of Chaya should be planted 1-2 m apart, with 60 cm between plants in a row.

The first edible leaves are generally produced within 3-5 months of transplanting seedlings. The early growth of young Chaya plants is slow, but after the first year the plants can be pruned, resulting in rapid new growth. No more than 50% of the total leaves should be removed when harvesting in order to ensure continuous vigorous plant growth.

Most people prune Chaya to a height of 1.5-2m to make it easy to harvest leaves. Continuous harvesting of tender shoots and young leaves will help maintain the plant at a convenient height. Periodically, the plant should be cut back to a height of 50 cm to promote the production of new growth. The pruned branches can be used as mulch around the base of plants.

Chaya is a drought-resistant plant, even in sandy soils. It grows well in both sunny and shady conditions, making it a good species for agro-forestry systems. Fertilizer is not necessary although plants will have more leaf growth if they are fertilized and watered. Chaya is resistant to most insects and plant diseases although it can be affected by bugs, broad mites, spider mites and aphids and it is a host of CCMV (Cassava Common Mosaic Virus).

Other uses for Chaya

Chaya, as mentioned, makes a very good living fence – to go around home gardens or elsewhere on your property. It also provides the needed shade for coffee trees and other species used in agro-forestry systems. Some of the other uses of Chaya include:

- Compost made with pruned Chaya branches will be high in nitrogen and can be used to fertilize vegetable gardens.
- Dried or fresh Chaya leaves and branches make good fodder for chickens, and help to increase egg production.
- Growing Chaya at health centers is a good way to teach people about the nutrition benefits of using Chaya in family meals. Leaves can be harvested to give to families to take home and try. Also, cuttings can be made from plants for people to transplant and grow at home.

Cambodia HARVEST

No. 46 Street 310 | Sangkat, Beong Keng Kang 1
Khan Chamkamorn | Phnom Penh, Cambodia
Tel: 855 (0) 23 996419

This bulletin is made possible by the support of the American People through the United States Agency for International Development (USAID). The content is the sole responsibility of Fintrac Inc. and does not necessarily reflect the views of USAID or the United States Government.