

AMARANTH

Botanical name: *Amaranthus spp.* (Amaranthaceae)

Location specific common names: te mota (Kiribati), mota (Tuvalu), moca, tubua, aupa, bhaji, bayam

Plant Characteristics: Amaranth is a small to medium-sized annual bushy plant with a distinct taproot, diamond shaped leaves and feather-like seed heads. Numerous species exist, many selected and grown for grain, leaves or for their ornamental value, although some are classed as weeds. *A. tricolor* is a popular species for leaf production. Amaranth grows well on coralline atoll soils, especially with composting.

Uses: Young leaves of most species are edible but some produce large tender leaves and are grown specifically for leaf consumption. Leaves are best prepared lightly steamed; older leaves require longer steaming or they can be added to moist dishes like soups, curries and stews. Uncooked amaranth leaves should not be consumed as the oxalate content reduces the bioavailability of iron, zinc, calcium and magnesium; cooking reduces the oxalate level. Tender stem tips are better peeled before cooking.

Medicinal: Amaranth leaves are used in many countries to treat inflammation, fever, digestive tract disorders (including diarrhoea, dysentery, ulcers), and reduce risk of heart disease and diabetes by lowering high blood pressure, high low-density-lipoprotein cholesterol and blood sugar level. Scientific studies provide evidence to support these effects.

Availability: Amaranth can be grown year-round in most tropical and subtropical locations. It is reported to be the most popular leafy vegetable in Fiji, but is not yet marketed in Kiribati or Tuvalu.

Propagation methods: New plants are produced from seeds, which are very small; young seedlings transplant readily.

How to grow: Amaranth is well suited to growing in large pots or garden beds with a well-drained loam and compost mix. It will grow in full sun, but afternoon shade encourages good leaf production. Soils of poorer fertility and insufficient water produce slower growing, smaller leaved plants with thinner stems, which flower earlier.



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Threats: This plant is relatively pest/disease resistant; however, leaf eating insects such as grasshoppers are occasional pests and may become a problem.

Harvesting: Plant growth is promoted by regular harvesting. The tips, usually back to the 5th newest full leaf and fresh looking older leaves can be picked and loosely packed in moist paper. Harvesting in the cooler hours of the day prevents drying/wilting. Once a tip has been harvested the plant will continue to grow and produce one or more new tips suitable for picking in a few weeks.

Post harvest and storage: Leaves should be washed carefully with water of drinking quality or clean seawater. They can be bundled with their stems trimmed and stood upright in a small amount of clean fresh water. If covered with a clean plastic bag and kept cool, they should store for a day or two. If placed in an airtight container in a refrigerator they can last for up to a week. Leaves are firm and can be stored frozen.

Project findings/Nutritional value: Samples were collected in Kiribati and Samoa (see table below). Amaranth is a nutritious all-rounder, being a good source of protein, carotenoids and most minerals, particularly zinc, calcium and magnesium. About two handfuls (100 grams) per person for a meal serving will provide useful nutrition.

Protein: This is important in forming muscle, cell membranes, enzymes, blood components, antibodies, DNA and RNA. The mean nitrogen analyses of our samples indicated a good protein level of around 19%.

Carotenoids: Lutein is important for eye health (e.g. reducing risk of cataracts), and beta-carotene (pro-vitamin A) is important for vision, immunity and bone health.

Zinc: Important for immunity, growth, carbohydrate metabolism, and DNA and protein formation. Humans have around 600 different Zn-containing enzymes/proteins.

Magnesium: This mineral is important in bone formation, energy production, and nerve and muscle function.

Calcium: The most important mineral for the growth and maintenance of bones and teeth. Calcium is also important for cellular physiology.

This table compares selected mineral nutrients and carotenoids in leaves of amaranth and sweetpotato grown together at Lotofaga, Upolu, Samoa in 2012 and English cabbage (average of samples bought from Honiara market, Solomon Islands and Nukualofa market, Tonga in 2012) (concentration in mg/kg dry weight, except N: % dry weight). The amaranth sample collected on Tabiteuea North atoll, Kiribati was higher in Zn and Mn and lower in N, P & K than the Samoa sample.

	Mn	Zn	Ca	Mg	K	P	S	N %	lutein	alpha carotene	beta carotene
Amaranth	58	64	15500	18800	45000	6400	4400	5.3	462	8	350
Sweetpotato	75	23	5500	4600	15900	3600	3200	4.6	457	10	317
Cabbage	23	20	5700	1450	29000	3750	3750	2.8	5	0	2

Mn: manganese; Zn: zinc; Ca: calcium; Mg: magnesium; K: potassium; P: phosphorus; S: sulphur; N: nitrogen
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