

PURSLANE

Botanical name: *Portulaca oleracea* (Portulacaceae)

Location specific common names: te boi (Kiribati), Katuli (Tuvalu), pigweed, little hogweed, duckweed, parsley, red root, verdolaga. *P. lutea* has rounder, fleshier leaves and *P. australis*, te mtea (Kiribati) or pigface, has longer, fleshier leaves than the others. All three species are edible.

Plant Characteristics: Purslane has smooth, reddish, mostly prostrate stems and green, succulent leaves, with yellow flowers. It is a fast-growing annual, thrives without fertiliser and tolerates drought and salt. Like some other *xerophytes* (plants that thrive in dry conditions) it employs an unusual photosynthetic strategy: although it uses mostly the “C4” photosynthetic pathway, when drought-stressed it switches to an alternative pathway: crasulacean acid metabolism (CAM). When this pathway is used, the leaves trap carbon dioxide at night, converting it to malic acid, and during the day the malic acid is converted to glucose. Hence leaves harvested in early morning have 10 times the malic acid of leaves harvested in late afternoon, and taste more tangy.

Uses: The leaves are tasty and nutritious. They contain some oxalate, which is reduced by cooking. Nevertheless, levels are low (similar to spinach) and purslane can be eaten raw, for example in salads. It can be cooked by stir frying or steaming. It is renowned for its **Medicinal** applications: It contains the highest levels of desirable omega-3 fatty acids of any plant analysed (for example, 0.01 mg/g of eicosapentaenoic acid, EPA). These are essential for human growth, development, maintaining immunity and lowering disease risk. It also contains numerous other beneficial phyto-compounds (including polyphenols, sterols, anthocyanins, carotenoids) and is used in various countries for an astonishing range of medical/health purposes. These include, among others, application against diabetes, cancer, heart disease, inflammation, fever, oxidative stress, low density lipoprotein cholesterol, high blood pressure, Alzheimer’s disease, bipolar syndrome, colitis, microbial pathogens, liver toxins, and it can stimulate lactation. Indeed, the name *Portulaca* means “to carry milk”.

Availability: Purslane probably originated in India. It is remarkably adaptable and is now flourishes in all but the coldest climates worldwide. It is common on most atolls of Kiribati and Tuvalu, often growing unplanted on unused land.



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Propagation methods: It can be propagated by seed and cuttings. One plant can produce up to a quarter of a million seeds, which can remain viable for up to 40 years. Once established in a particular area, it will return year after year as long as it is allowed to flower and produce seeds.

If hand planting, just spread the seeds on the soil surface, rather than bury them, as they require light to germinate. Place stem cuttings on the ground, water and they will take root.

How to grow: As purslane does not like wet (or cold) conditions, water sparingly until the plants are established. They grow best in sunny situations.

Threats: Shade weakens purslane and makes it more susceptible to pests and diseases such as aphids (which can be removed by spraying with soapy water) and fungi (especially in wet seasons).

Harvesting: Any of purslane's succulent leaves can be used for eating. The older leaves will taste more sour than the younger leaves.

Post harvest and storage: The leaves should be washed with clean water and stored in a cool, shady place, and ideally eaten soon after picking.

Project findings/nutritional value: Purslane is a wild, edible, nutritious food. Samples were collected in Tuvalu and Kiribati. Purslane is particularly high in magnesium. The level of 41,000 ppm found in the sample collected at Chevalier College, Abemama, Kiribati is the highest magnesium level we have found in plants we have analysed back to 2007. This plant is also an excellent zinc accumulator, similar to cassava leaves. The high omega-3 fatty acid content of purslane was noted above. About two handfuls of leaves/stems (100 grams) per person for a meal serving will provide useful nutrition. Purslane is notable for:

Magnesium: This mineral is important in bone formation, energy production, and nerve and muscle function. Furthermore, it has anti-inflammatory effects, and magnesium deficiency is a risk factor for obesity, metabolic syndrome and diabetes.

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

Iron: Important for healthy blood and energy.

Carotenoids: Purslane leaves are a good source of pro-vitamin A: other studies have found levels around 1320 international units/100g fresh weight. This is important for vision, immunity and bone health.

This table presents selected mineral nutrients in leaves of purslane growing on coralline soil in the front garden of a house in the town centre on Funafuti Atoll, Tuvalu in August 2014. The other plants were growing nearby. 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).

	Fe	Mn	B	Cu	Zn	Ca	Mg	K	N
Purslane	70	5	50	14	103	16900	22000	31000	3.3
Ceylon spinach	31	9	33	11	92	21000	14800	36000	3.5
Ofenga	33	19	26	14	61	23000	17700	7000	3.4
Hedge panax	33	56	38	6	71	25000	6700	12000	2.7
Chaya	76	19	19	9	42	16100	5500	16400	5.1
Cabbage	40	23	12	2	20	5700	1450	29000	2.8

Fe: iron; Mn: manganese; B: boron; Cu: copper; Zn: zinc; Ca: calcium; Mg: magnesium; K: potassium; N: nitrogen
Analyses conducted by Waite Analytical Services, University of Adelaide, South Australia

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Compiled by G. Lyons, G. Dean, R. Kiata, Layout by S.Tukidia.

