

Tetragonia tetragonoides
Aizoaceae
New Zealand Spinach

Tetragonia tetragonoides is an annual herb that grows to heights of up to 0.5 m. Plants have numerous stems that spread to heights greater than 3 dm. Leaves are 2-5 cm, with triangular and ovate blades. Inflorescences include 1-3 flowers, which are 5 mm across with 4-5 spreading sepals. This species is native to the southern hemisphere; it is a widespread littoral and estuarine species of the Pacific region from South America to Japan and southeast China (including Norfolk and Lord Howe Islands), New Zealand, the Kermadec Islands, New Caledonia, Hawaii, and other Pacific Islands. Prescott (1984) considered this species to be native to New Zealand and Australia. In South America, *T. tetragonoides* is found naturally on both the southeastern and southwestern coasts from central Chile and Uruguay southward to about 45 degrees south (Taylor 1994), and is widely naturalized in temperate and subtropical parts of the world as an escape from cultivation. It is common in California on sand dunes, bluffs, and the margins of coastal wetlands below 100m.

Although typically littoral and estuarine throughout most of its natural range, *T. tetragonoides* is also found in salty soils in some subcoastal and inland areas in Australia, where it is commonly found after rains in burned, cleared, or drought affected parts of northern New South Wales and southern and central Queensland (Everist 1981). Herbarium specimens in Australia have been used to confirm that *T. tetragonoides* is a serious weed in wheat crops in Queensland, causing wheat to be stunted, presumably due to competition for water (Gray 1997). The fruits of *T. tetragonoides* are dispersed by water and can remain viable for more than a month in salt water (Taylor 1994).

T. tetragonoides was one of the first Australian plants used as food by Europeans from Captain Cook and Sir Joseph Banks onwards, being boiled and eaten like spinach, and some inland populations of this species in Australia may be due to introductions from the coast for use as a vegetable. Cook also used the plant as an antiscorbutic both in New Zealand and Australia (Grey 1997). Low (1989) suggests that *T. tetragonoides* became the first Australian food plant to be cultivated overseas, the seeds being taken to Kew Gardens by Banks in 1771. Seeds were later distributed from Kew to Europe and North America. Cooper and Gambie (1991) report that this species contains certain alkaloids, saponins, and tetragonin, a yeast growth regulator. It also exhibits carbonic anhydrase activity, which apparently has opposing effects to sulphonamide drugs. More recently, this species has been shown to contain cerbrosides, compounds which have anti-ulcerogenic properties. It has been used in traditional medicine in eastern Asia for the treatment of esophageal and stomach cancer (Grey 1997).

High levels of soluble oxalate have been reported for *T. tetragonoides* in Australia, and this species has also been reported to contain alkaloids and significant amounts of saponin (Hurst 1942) and nitrates (McBarron 1977). Levels of oxalates and nitrates are especially high in young succulent plants, and concentrations of oxalates may reach levels

toxic to livestock (Everist 1981, McBarron 1977). However, as Everist (1981) points out, livestock rarely eat these plants when they are young and succulent, leaving it until stems are dry and presumable low in oxalates.

References

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