

## *Tetragonia* L.

***Tetragonia tetragonioides*** (Pallas) Kuntze, NEW ZEALAND SPINACH. Annual, fleshy, taprooted, several-stemmed at base, mat-forming, regularly branching from main axis to form weaker axillary shoots, prostrate to decumbent, typically < 30 cm tall; shoots green, glabrous, glistening and appearing crystalline from water-storing epidermal papillae (vesicles) on all exposed surfaces. **Stems:** weakly angled, > 5 mm diameter, with a low ridge descending from each leaf and extending for 1–2 internodes, tough and fibrous. **Leaves:** helically alternate, simple, petiolate, without stipules; petiole typically 10–20(–30) mm long, winged; blade triangular to rhombic-ovate or ovate, in range 8–70 × 6–50 mm, typically fleshy but on lower axillary shoots less so or thin, becoming thin and brown when senescent, truncate, tapered, or weakly arrow-shaped with rounded angles at base, entire, inrolled to the lower side and somewhat wavy on margins, acute at tip, pinnately veined with principal veins slightly sunken on upper surface and conspicuously raised on lower surface, lower surface lighter colored and with larger to vesicular papillae. **Inflorescence:** cyme, axillary, typically 1-flowered but sometimes with 1 or 2 additional sessile flowers arising from the lateral horns of the fleshy, receptaclelike hypanthium, lacking bracts, glabrous; peduncle 0.5–2 mm long, compressed and expanding to flower base. **Flower:** bisexual, bilateral, when perianth spreading ca. 3–4 × 4–6 mm across; hypanthium cuplike, fused to ovary to above midpoint and opposite tip of ovary chambers, bumpy with 4–8 unevenly-spaced, short mounds, green and papillate; **sepals** 4–5, arising from edge of hypanthium, fleshy, spreading at anthesis, arching inward over pistil before and after anthesis, not overlapping, unequal, ± 1.5 mm long, the widest sepal somewhat semicircular (hemi-oblate), 4 mm wide, the other sepals acute-ovate, 1–2.8 mm wide, upper surface greenish yellow and minutely papillate, lower surface green and conspicuously papillate; **petals** absent, petaloid staminodes absent; **stamens** 10–15, free, attached 0.3–0.5 mm from top of hypanthium, sometimes in groups of 2 or 3 and alternate with the smaller sepals, others opposite the larger sepal and irregularly arranged; filaments equal, ± 0.8 mm long, yellow; anthers dorsifixed, dithecal, 0.6 mm long, each sac ellipsoid to slightly kidney-shaped, light yellow aging deep pink to brownish, longitudinally dehiscent; pollen pale to light yellow; **pistil** 1, ovary hemi-inferior, ± ellipsoid, 2 × 3 mm wide, green, domed and papillate with very large papillate vesicles above each chamber, 4–9-chambered, each chamber with 1 ovule attached to top; styles 4–9, linear, 0.7–1 mm long, erect but above midpoint arching outward, green becoming purplish, conspicuously papillate. **Fruit:** nutletlike, indehiscent, 1-seeded per chamber, compressed inversely bell-shaped to compressed top-shaped, 6.5–12 × 8 × 12 mm, generally with 4–6 short horns, hard after surface (hypanthium) dries, with persistent sepals and stigmas; endocarp hard, brown. **Seed:** teardrop-shaped (lacrimoid) and completely filling chamber, ± 3 × 1.5 mm, white to brown when ripe. Late March–early August.

Naturalized. Annual occasionally found along coastal strand, e.g., at La Jolla Cove and near Malibu Lagoon, prostrate and forming dense, heavy mats on rocky, stable sand. *Tetragonia tetragonioides*, New Zealand spinach, is edible as a vegetable; it has fleshy, triangular leaves that tend to curl under. The hypanthium (“floral cup”) is fused to the ovary, and the hemi-inferior ovary develops into a brown, multi-seeded dry fruit with short

horns beneath the persistent, shriveled calyx. Close scrutiny reveals that a solitary flower may form 1 or 2 sessile flowers from the horns, and thus can resemble a several-flowered cyme.

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