Cyperus esculentus L. var. ***leptostachyus*** Boeck., YELLOW NUTSEDGE, YELLOW NUTGRASS. Perennial herb with annual plants, clonal, stolon-bearing and tuber-forming (with ramets), lacking rhizome, fibrous-rooted, ± rosetted, 1-stemmed at base, unbranched, erect, in range 20–92 cm tall; shoots with 3–10 green, ascending basal leaves (older ones withered) and several ascending to spreading, leaflike inflorescence bracts forming a reproductive canopy at tip of stem, leaf sheaths covering stem base, glabrous; each basal leaf precociously forming a shallowly buried stolon from its axillary bud, stolons horizontal and radiating from buried base of stem (in sand 80–100 mm belowground), unbranched and piercing leaf sheath, slender, 30–750+ × 1.3–2 mm, white aging orangish brown, flexible (remaining so when dried), with membranous scales (leaves), with internodes (6–)35–40(–50) mm long, the leaves alternate distichous, = sheaths, sheath of stolon scales closed 2–6 mm, at maturity 6–20 mm long, acute to acuminate at tip, parallel-veined having purplish red veins and with veins converging at tip; tuber terminal on stolon (shoot tuber), subspheroid, in range mostly 3–16 × 3–11.5 mm diameter, white, with acute tip, having condensed nodes at base with encircling, thin, closed sheaths of future basal leaves covering the spheroid solid stem, the outer, oldest leaf often split into triangular segments and with purplish red veins, dead, and somewhat papery on surface of tuber, often with sand grains adhering to surface, with or without adventitious roots while still attached to stolon. **Stem (culm):** 3-angled, to 450 mm long, 3–5.5 mm diameter, white at base to green and with concave faces above leaf sheaths, tough, smooth; solid. **Leaves:** alternate tristichous, simple with sheath; sheath closed, closed portion to 70 mm long, to 10.5 mm wide, whitish to pinkish with wide membranous margins approaching blade, parallel veins often purple-red along part of length; ligule absent; blade ascending, linear and V-shaped folded along midrib, mostly 130–380 × 5–10.5 mm, the widest at base, tough, entire, long-tapered to tip, parallel-veined with midrib slightly sunken on upper surface and raised on lower surface, glossy, especially on upper surface. **Inflorescence:** leafy paniclelike and umbel-like arrays, terminal, with spikelets formed along rachis (< 20 spikelets) on ascending to erect, axillary branches (rays), array with 4–11 primary rays, the longest axes (> 100 mm long) also having 1–several secondary branches below the sessile spikelets, eventually each primary and secondary branch with a visible rachis having spikelets radiating at 75–90° (divaricate), each primary ray subtended by an inflorescence bract (terminal spikelet clusters bractless) and also a sheathing bract (prophyll), glabrous; inflorescence bracts alternate tristichous but slightly twisted, mostly ascending, unequal, leaflike but sheathless and fused to axis, linear, to 420 × 10 mm, the widest at base, successively shorter and narrower from base to tip of array, 2(–4) inflorescence bracts >> reproductive canopy, green bracts leaflike, V-shaped, entire, smooth, reduced upward eventually to a scalelike, triangular, membranous base + a linear green tip, the green tip short and threadlike for the tiniest primary ray or lowest spikelets of a branch; primary ray axes (including rachis) to 185 mm long (rachis 5–24 mm long), lower branches ascending and upper ones erect, compressed front-to-back and often forming lateral edges, with pulvinus at base and a prophyll above pulvinus, pulvinus bulbous and white, primary prophyll several–24 mm long, sheath closed entire length, the larger ones strongly 2-keeled, membranous, truncate with 1–2 short teeth, many-veined with green veins above changing to red then deep purple or black at pulvinus, truncate at tip with 1–2 short teeth and not splitting, prophylls of upper branches reduced, whitish-membranous with lighter

pigmented veins; bract subtending secondary branches with reduced scalelike bract, a 2-order prophyll, and smaller a pulvinus. **Spikelet:** typically = 2 or 3 order of inflorescence, (1–)several–21-flowered, compressed and oblong or narrowly lanceoloid, in range (3.5–)6–21 × 1.5–2 × 0.8 mm, with alternate distichous bractlets (floral scales) subtending sessile flowers; **glumes** (bracts subtending spikelet) 2, yellowish brown with conspicuous veins, lower glume with membranous ovate base ca. 1.6 mm long and sometimes with linear blade, lower glume reduced upward, upper glume broader and sheathing, broadly ovoid-rectangular, ca. 2 mm long, somewhat truncate to broadly notched at tip; spikelet with irregular, green pulvinus on upper side where spreading 75–90° but lacking at tip where spikelet ascending to erect, axis (rachilla) internodes ca. 0.8 mm long, 2-ridged; bractlet ± appressed, overlapping to midpoint of next bractlet, ± ovate, in range 2.5–2.9 mm long, closely 2-keeled from base and merging at or just below tip, with 3 green veins along keels, yellowish brown between keel and margins but narrowly membranous on margins, obtuse and minutely pointed at tip, lateral veins on each side of keels ca. 5, red to reddish brown, glabrous, deciduous. **Flower:** bisexual; **perianth** absent; **stamens** 3, free, exserted from bractlet; filaments flat-linear, ca. 3 mm long, translucent; anthers basifixed, dithecal, 1.5–1.6 mm long (including sterile appendage at tip), light yellow, the appendage narrowly tapered and whitish, longitudinally dehiscent; pollen light yellow; **pistil** 1, ca. 4 mm long; ovary superior, 3-angled ellipsoid-oblanceoloid, ca. 0.7 mm long, green, 1-chambered with 1 ovule; style translucent aging brownish, 3-branched at or just above 1 mm, the branches exseted, ascending or later coiled, ± equal, threadlike. **Fruit:** achene (seldom present), 3-sided obovoid, in range ca. 1.3 × 0.5 mm, brown, slightly beaked at tip, finely textured. Late June–late August.

Naturalized. Perennial herb to date only collected in range from a sandbar in Calleguas Creek near California State University Channel Islands. *Cyperus esculentus* is botanically a very interesting clonal plant that seldom produces fertile fruits; it reproduces reliably and asexually from tubers, which in the typical European form are consumed (nutsedge), and tubers are the reason why this becomes a noxious weed when found in agricultural fields. The plant grows from a tuber (or seed within an achene), and produces numerous basal leaves. Without a resting stage, the axillary bud for each leaf forms and immediately becomes a slender horizontal stolon, so that the young vegetative plants has a set of radiating stolons. Each stolon potentially forms from its growing tip a subspheric tuber covered by thin, closed leaf sheaths surrounding a solid core (stem). The plant flowers but generally does not produce viable fruits, and that plant behaves like an annual and its stolons die, but a new cohort of annual plants is produced the next spring from asexual tubers. Some plants are connected during year two via a stolon, which can produce adventitious root. *Cyperus rotundus* is a closely related species that also clones via stolons and tubers and should be expected in range; this species has purple spikelets and black achenes.

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