

*Cosmos bipinnatus* Cav., GARDEN COSMOS. Annual, taprooted, 1-stemmed at base, with a pair of spreading to ascending branches at each node, ascending to erect, in range 30–60+ cm tall; shoots with feathery cauline leaves, nearly glabrous, not aromatic. **Stems:** cylindric, to 10 mm diameter, striped on young growth alternating green and whitish to rose, with short hairs especially near base of young internodes, becoming glabrescent. **Leaves:** opposite decussate, finely 1–3-pinnately dissected with several–7 pairs of opposite lateral primary lobes, petiolate to ± sessile with pairs fused across node, stipules absent; petiole partially sheathing, channeled, to 40 mm long, with fine hairs in channel; blade rhombic to broadly ovate in outline, 30–70(–130) × 30–55(–100) mm, primary lobes diverging at 45°, typically 3-lobed with segments alternate; axis ridged, segments separating paired lobes gradually shorter, with raised midvein in channel; ultimate segments linear-oblongate or linear to narrowly oblong or elliptic, 3–40 × 1–2(–4) mm, asymmetric at segment base being closer to inner margin, folded upward from midrib, entire, midrib raised on lower surface, lower surface midrib in fresh condition having elongated, convex epidermal cells and scattered, minute glands. **Inflorescence:** heads, in terminal, cymelike arrays with 1–several heads, head radiate, with 8 showy ray flowers and many disc flowers, bracteate, glabrous; bract subtending peduncle leaflike = reduced cauline leaf; peduncle 60–110 mm long, sometimes with bract above midpoint (= bract of a future peduncle); bracts subtending involucre 8 (calyculus), ± pseudowhorled with fused bases, spreading to radiating, narrowly ovate to lanceolate with acuminate tips, (6.5–)9–15(–18) × 2.2–2.6(–4.5) mm, glossy green, narrowly membranous except at tip, parallel-veined; **involucre** hemi-cylindric, ± 12 mm diameter, phyllaries 8 in 1 series, overlapping and fused 1 mm at base, narrowly ovate with spreading, acute tips, 10–11 × 4–6 mm, pale green (tinged purple) with translucent, wide-membranous margins, aging erect and brownish in fruit, basal tube thickened, papillate-fringed at tip; receptacle flat, with bractlets subtending disc flowers (paleae), palea erect, flat to ± keeled, oblongate with tail-like tip (caudate), 7–11 × 1.5–2.4 mm, tip 4–4.5 mm long, membranous becoming scarious with faint veins and a yellow tip, the tip exerted above flower bud. **Ray flower:** sterile, bilateral, 21–26 mm across; **calyx (pappus)** absent; **corolla** weakly 3-toothed or 5-toothed; tube strongly flattened front-to-back, trapezoidal, 4.3–5 × 1.5–2 mm, whitish aging with purplish veins, with scattered, inconspicuous hairs; limb spreading, lanceolate to elliptic or oblong, 23–25(–40) × 10–14(–26) mm, brilliant red-purple or deep purplish red (white or rose pink) above and rose and lighter beneath, with many parallel veins, upper surface ± velveteen, on lower surface 3(4) veins raised as ribs, veins with inconspicuous hairs; **pistil** vestigial, flattened front-to-back, < 0.8 mm long. **Disc flower:** bisexual, radial, 1.3–1.5 mm across, 8–9 mm long; **calyx (pappus)** absent (minutely 1-pointed or 2-pointed); **corolla** 5-lobed, 5.5–7 mm long; tube cylindric, 2 mm long, white, with scattered, inconspicuous hairs; throat 3.5–4.7 mm long, expanded to 1 mm wide at orifice, white, turning to yellowish at top above constriction, 5-veined; lobes erect to ascending, deltate, 1 mm, vivid to golden yellow, thick-margined and papillate on thickened inner surface, with a triangular, colorless patch at base or tapering almost to tip; **stamens** 5, fused to base of corolla throat; filaments ± 2 mm long, white, glabrous at base and tip, hairy over mid-section with transparent, ± club-shaped hairs; anthers fused into cylinder surrounding style, partially exerted at anthesis, basifixed, dithecal, ± 2.7 mm long, deep purple to brown, arrow-shaped at base, with erect terminal appendages, the

appendages cordate-ovate,  $\pm 0.6 \times 0.5$  mm, transparent yellow, acute at tip, longitudinally and inwardly dehiscent; pollen golden to strong yellow; **pistil** 1; ovary inferior, narrowly gourd-shaped to club-shaped with a cylindric beak truncate at tip, 1.3–2.5 mm long, off-white, with upward-pointed barbs on beak and upper ovary, 1-chambered with 1 ovule; **nectary** collarlike at base of style, 0.2 mm long, amber-colored; style exerted ca. 2 mm, 6–8 mm long, whitish becoming yellow above midpoint, 2-branched, the branches ascending becoming strongly recurved,  $\pm 1$  mm long, golden yellow, papillate on back side, with ring of hairs below acuminate stigma. **Fruits:** cypselae, club-shaped + cylindric beak, 8–13+  $\times$  1.5 mm (beak 2–4 mm long), brown, slightly curved, sometimes weakly 4-sided, finely warty (hair bases) with upward-pointing barbs on beak and fruit tip. Late July–mid-September.

Naturalized. Annual grown in many local gardens but discovered escaped along a creek bank in Lower Santa Ynez Canyon of SMM in late July, 2006. The form of *Cosmos* collected was a small specimen growing in shade with deep red-purple flowers, but taller, erect specimens with either white or rose pink ray flowers can be expected. The fruit has two awns, and hence it has a dispersal mechanism to attach to bird feathers, as do its relatives in the genus *Bidens*.

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