

298. SIMSIA Persoon, Syn. Pl. 2: 478. 1807 • Bush sunflower [For John Sims, 1749–1831, British physician and botanist]

David M. Spooner

**Annuals, perennials, or subshrubs** [shrubs], 20–400 cm. **Stems** erect or ascending [decumbent], sparingly to freely branched. **Leaves** cauline; opposite (proximal) or alternate [whorled]; petiolate (petioles often ± winged, often with expanded bases, those bases sometimes fused to form nodal “discs”) [sessile]; blades 3-nerved from bases, mostly deltate to ovate [linear], sometimes 3- [5-]lobed [pinnatifid], bases cordate to cuneate, ultimate margins entire or toothed, faces hirsute, hispid, pilose, puberulent, scabrous, or scabro-hispid [sericeous], often gland-dotted or ± stipitate-glandular to glandular-puberulent. **Heads** radiate [discoid], borne singly or in 2s or 3s, or in tight to loose, corymbiform [paniculiform] arrays. **Involucres** campanulate [ovoid-campanulate to urceolate], 5–16[–22] mm diam. **Phyllaries** persistent, [11–]13–43[–66] in 2–4 series (tightly appressed to broadly reflexed, unequal to subequal). **Receptacles** low-convex, paleate (paleae conduplicate, ± enclosing cypselae). **Ray florets** [0–]5–21[–45], styliiferous and sterile; corollas orange-yellow [lemon-yellow, pink, purple, or white]. **Disc florets** [12–]13–154 [–172], bisexual, fertile; corollas concolorous with rays (usually turning purple apically), tubes (often glandular-hairy) shorter than throats, lobes 5, ± triangular (anthers black, yellow, or yellow proximally and bronze or purple distally; style branches relatively slender, apices sometimes attenuate). **Cypselae** flattened, thin-margined [thickened, biconvex] (shoulders minute to conspicuous, faces glabrous or hairy); **pappi** 0, or fragile or readily falling, of 2 ± subulate scales [plus 4–12 shorter scales].  $x = 17$ .

Species 20 (2 in the flora): sw United States, Mexico, West Indies (Jamaica), Central America, South America.

SELECTED REFERENCE Spooner, D. M. 1990. Systematics of *Simsia* (Compositae–Heliantheae). Syst. Bot. Monogr. 30: 1–90.

1. Perennials or subshrubs (roots fusiform-thickened); ray florets 8–21, corollas light orange-yellow (abaxial faces often brown- or purple-lined, or wholly brown or purple); disc florets (26–)90–154; anthers usually yellow, rarely black . . . . . 1. *Simsia calva*
1. Annuals (rarely persisting, taprooted or fibrous rooted); ray florets 5–10, corollas orange-yellow; disc florets 13–27; anthers yellow proximally, usually purple to bronze distally . . . . . 2. *Simsia lagasceiformis*

1. *Simsia calva* (A. Gray & Engelmann) A. Gray, Boston J. Nat. Hist. 6: 228. 1850 • Awnless bush sunflower

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*Barrattia calva* A. Gray & Engelmann, Proc. Amer. Acad. Arts 1: 48. 1847

**Perennials or subshrubs**, 30–150 cm (roots ± fleshy, fusiform-thickened). **Leaves**: petiole bases dilated (pairs fused to form discs at nodes); blades ovate, 2–8 × 1.5–6 cm, sometimes 3-lobed. **Heads**

usually borne singly, sometimes in 2s or 3s. **Peduncles** 3–30 cm. **Involucres** 10–12 × 7–16 mm. **Phyllaries** 21–43, subequal to unequal. **Ray florets** 8–21; corollas light orange-yellow (abaxial faces often brown- or purple-lined, or wholly brown or purple), laminae 5–16 mm. **Disc florets** (26–)90–154; anthers usually yellow, rarely

black. **Cypselae** 3.5–5.7 mm; **pappi** 0 or to 4 mm.  $2n = 34$ .

Flowering year round. Sand to heavy clay soils, rock crevices, often limestone, prairies, thickets, oak savannas, along streams, roadsides, upland pine or pine-oak forests; 30–2400 m; N.Mex., Tex.; Mexico.

*Simsia calva* is widespread throughout central, southern, and southwestern Texas from the southern Texas Plains to the trans-Pecos mountains and into southeastern New Mexico.

*Simsia calva* is distinguished from *S. lagasceiformis* by its perennial habit, fusiform-thickened roots, petioles winged and fused at bases to form nodal discs, heads borne singly or in 2s or 3s, and anthers usually yellow, rarely black. The common name, awnless bush sunflower, is not truly appropriate. Most populations are epappose; some have minute scales, and some populations of *S. lagasceiformis* (normally pappose) are epappose.

2. *Simsia lagasceiformis* de Candolle in A. P. de Candolle and A. L. P. de Candolle, Prodr. 5: 577. 1836 (as *lagascaeiformis*) • Annual bush sunflower

*Simsia exaristata* A. Gray

**Annuals** (rarely persisting), 20–400 cm (taprooted or fibrous rooted). **Leaves:** petiole bases rarely dilated (not fused to form nodal discs), blades ovate to deltate, 2–21 × 1–16 cm, rarely 3-lobed. **Heads** in tight to loose, corymbiform arrays. **Peduncles**

0.5–10 cm. **Involucres** 8–12 × 5–10 mm. **Phyllaries** 13–19, unequal. **Ray florets** 5–10; corollas orange-yellow,



laminae 5.1–12 mm. **Disc florets** 13–27; anthers yellow proximally, usually purple to bronze distally. **Cypselae** 4.2–6 mm; **pappi** usually 2.5–4.6 mm, rarely 0. **2n** = 34.

Flowering year round (mostly Sep–Dec). Deserts, roadsides, open fields, borders of agricultural fields; 100–2200; Ariz., N.Mex., Tex.; Mexico; Central America (Guatemala).

299. HELIANTHUS Linnaeus, Sp. Pl. 2: 904. 1753; Gen. Pl. ed. 5, 386. 1754

- Sunflower, tournesol [Greek *helios*, sun, and *anthos*, flower, alluding to heads]

Edward E. Schilling

**Annuals or perennials**, (5–)20–300(–500) cm. **Stems** erect or ascending to decumbent or procumbent, usually branched distally. **Leaves** basal and/or cauline; opposite, or opposite (proximal) and alternate, or alternate; petiolate or sessile; blades usually 3-nerved (1-nerved in *H. eggertii*, *H. smithii*, and *H. maximiliani*), mostly deltate, lance-linear, lanceolate, lance-ovate, linear, or ovate, bases cordate to narrowly cuneate, margins usually entire or serrate, rarely lobed, faces glabrous or hairy, often gland-dotted. **Heads** usually radiate (sometimes discoid in *H. radula*), borne singly or in ± corymbiform, paniculiform, or spiciform arrays. **Involucres** usually ± hemispheric, sometimes campanulate or cylindrical, 5–40+(–200+ in cultivars) mm diam. **Phyllaries** persistent, 11–40(–100+ in cultivars) in 2–3+ series (subequal to unequal). **Receptacles** flat to slightly convex (conic in *H. porteri*), paleate (paleae ± conduplicate, usually rectangular-oblong, usually ± 3-toothed, sometimes entire, apices sometimes reddish or purplish). **Ray florets** usually 5–30+(–100+ in cultivars), rarely 0, neuter; corollas usually yellow. **Disc florets** (15–)30–150+(–1000+ in cultivars), bisexual, fertile; corollas yellow or reddish (at least distally), tubes shorter than campanulate throats, lobes 5, triangular (style branches slender, appendages ± attenuate). **Cypselae** (usually purplish black, sometimes mottled) ± obpyramidal, ± compressed (glabrous, glabrate, or ± hairy); **pappi** 0 (*H. porteri*), or readily falling, of 2(–3) usually lanceolate, aristate, or erose scales (at the 2 principal angles, 1–5 mm) plus 0–8 usually shorter scales (0.2–2 mm).  $x = 17$ .

Species 52, including 1 hybrid (52 in the flora): North America, Mexico; introduced in the Old World.

The identification of sunflower species has long been problematic. C. B. Heiser et al. (1969) felt that the greatest contribution of their sustained efforts to understand sunflower taxonomy was not providing an easy way to identify sunflowers but rather an explanation for why they are so difficult. Taxonomic difficulties are based on a combination of factors, notably developmental and ecologic plasticity, the frequency of interspecific hybridization, and the presence of polyploidy. L. H. Rieseberg (1991) and Rieseberg et al. (1988, 1990) have subsequently documented the presence of species of homoploid hybrid origin to add to the complexity. The keys in this treatment have been modified somewhat with observations of features that require