

Xanthium L. COCKLEBUR

Xanthium spinosum L., SPINY COCKLEBUR. Annual, spinescent, taprooted, 1-stemmed at base with several principal lower branches and secondary branches arising at each node along main axis, spreading to ascending, 30–120 cm tall; monoecious; shoots at each node with a cauline leaf, a cluster of leaves on short axillary shoot, a stalked, 3-branched spine, and the inflorescence, feltlike and short-strigose, the nonglandular hairs bent 90° at base; 3-branched spine 1(2) formed lateral to petiole base of cauline leaf, if 1 with a pistillate head (bur) on other side of petiole, the stalk 2–4 mm long, greenish and short-strigose at base, light brown and sparsely short-strigose above, the sharp-tipped arms unequal to subequal, slender, (10–)15–23 mm long, central arm \geq lateral arms, light brown to light golden yellow, glabrous. **Stems:** shallowly ridged to angled aging cylindrical, to 20 mm diameter, light green with discontinuous dark green streaks, short-strigose, scattered hispid, and sparsely glandular, the glandular hairs minutely spheric and sessile or short-stalked. **Leaves:** helically alternate, simple and often deeply pinnately lobed with a pair of lobes near midpoint, petiolate, without stipules; petiole obscurely channeled (beneath hairs), 1–26 mm long, densely short-strigose; blade lanceolate to elliptic (linear), 25–110 \times 5–36 mm long, broadly to slightly tapered at base and sometimes oblique, entire or with 1(–3) pair of lateral lobes or teeth per edge, lobes acuminate at tip, pinnately veined with principal veins slightly sunken on upper surface and raised on lower surface, upper surface dark green and satiny with scattered appressed hairs and densely grayish short-strigose along veins, lower surface densely transparent-white to white and short-strigose.

Inflorescences: unisexual heads, paired or solitary at nodes lateral to petiole (sometimes only burlike pistillate heads), or in terminal, racemelike or narrowly paniclelike arrays of several staminate heads and 2+ burlike pistillate heads, terminal arrays to 60 mm long, burlike pistillate head containing 2 highly modified discoid flowers, staminate head discoid, 16–60+-flowered, bracteate, short-strigose to \pm tomentose; peduncles of heads 0–8 mm long. **Staminate head: involucre** \pm hemispheric to conic, 4–6 mm across, phyllaries 3–10 in 1–3 series, lanceolate, 0.9–1.5 mm long, green, with short-strigose hairs becoming rusty orange; receptacle domed to conic or cylindrical, with bractlets (paleae), palea subtending ovary lanceolate to oblanceolate or spatulate, 1–3 \times 0.3–0.5 mm, green, short-strigose to \pm tomentose on outer surface. **Staminate flower:** radial, ca. 1.2 mm across; **calyx (pappus)** absent; **corolla** 5(–6)-lobed, inversely conic, 2–3 mm long; tube transparent pale green, sparsely pubescent; lobes broadly deltate, 0.5 \times 0.7 mm, dark purple on margins (obvious prior to anthesis), densely short-strigose to \pm tomentose on outer surface; **stamens** 5(–6), fused to corolla tube; filaments fused into tube, \pm 1.5 mm long, expanding slightly from base upward; anthers free, fully exerted and spreading, basifixed, dithecal, linear, \pm 1.2 mm long, yellow to yellowish green, longitudinally dehiscent; pollen light yellow; **pistil** vestigial, sterile; ovary 0.1–0.15 mm long; style included in filament tube, 1.5–1.7 mm long, unbranched. **Pistillate head:** 2-flowered (concealed within involucre); **involucre** sessile, ovoid to ellipsoid, at anthesis ca. 3 \times 1.5 mm, 2-chambered with a pore at top of each chamber for exerted style, with numerous, helically alternate, flexible, hooked bristles aging rigid, densely tomentose and glandular; chamber pore 2-toothed with typically only 1 tooth elongating as a beak, the beak erect, \pm 2 mm long, sharp at tip, other tooth ca. 0.5 mm long. **Pistillate flower:** hidden except

style; **perianth** absent; **stamens** absent; **pistil** 1; ovary inferior, 1-chambered with 1 ovule; style exerted, with 2 very long branches arising through opening at top of chamber.

Fruits: 2 cypselae, enclosed in a woody, burlike, indehiscent involucre; involucre ovoid to ellipsoid, 12 × 5 mm, with 70–105 hooked bristles and typically 1 beak, tomentose and glandular, the bristles 2–3 mm long, sharp-tipped on hook; cypselae ± sausage-shaped, 8–9 × 1.8–2 mm, tipped with persistent style, dark gray-brown to brownish green, with 10–12 longitudinal grooves. Late July–early October.

Naturalized. Annual, spinescent weed occasionally encountered in waste areas near roadsides and especially agricultural fields. *Xanthium spinosum* has very sharp-tipped, three-armed spines at each node, lateral to the petiole of the cauline leaf, and commonly the blades are dark green with a contrasting gray midrib on the upper surface. This monoecious species has many unusual features of the staminate and pistillate heads, and there is inconsistency in the literature to describe these. We have interpreted the bracts of the staminate head that do not subtend a flower as phyllaries, and bractlets subtending flowers as paleae. On the pistillate bur, the hooked bristles are phyllaries but the straight spine at the tip perhaps should be treated as a palea. The bur contains two fruits (cypselae) and is adapted for dispersal by animals, but in range spiny cocklebur does not appear to be spreading at this time.

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