

Centromadia pungens (Hooker & Arnott) Greene subsp. *pungens*, COMMON SPIKEWEED. Annual, spinescent (especially when dry), taprooted, with spreading, rigid branches on upper plant or throughout, initially ascending becoming mostly spreading, in range 7–45 cm tall; shoots with young leaves tufted on unexpanded axillary shoots in leaf axils, villous, hirsute (uniseriate), and sometimes scabrous, lacking glandular hairs, lacking a distinctive odor. **Stem:** cylindric, 2.3–5 mm diameter at base, pale green to whitish aging satiny tannish, with white hirsute hairs. **Leaves:** helically alternate (on axillary shoot the lowest 2 leaves appearing distichous), in range 1-pinnately lobed with 7–12 pairs of lateral lobes (basal and lower cauline leaves) and unlobed (upper cauline leaves), sessile, without stipules; blade of lower leaves linear-lanceolate in outline, in range 50–75 × 10–13 mm, 1.7–2.7 mm wide at sinuses, lateral lobes triangular to narrowly oblong or lanceolate, 0.8–10 × 0.8–2.3 mm, terminal lobe lanceolate, 7.2–11.3 × 1.8–3.2 mm, lobes acute to acuminate with short spine at tip, pinnately veined with midrib raised on lower surface, hirsute and scabrous with opaque, short conic to acuminoid hairs; blade of unlobed cauline leaves narrowly triangular to narrowly lanceolate, 8.5–23.5 × 1.4–4.2 mm, slightly clasping at base, entire or with 1–4 teeth per side and sometimes stiffly ciliate, becoming somewhat inrolled under (revolute), acute with short spine at tip, hirsute and sometimes sparsely scabrous. **Inflorescence:** heads, terminal on principal shoots and later on unexpanded shoots of canopy, head radiate, 9–15 mm across, of 11–26 ray flowers and 25–105 disc flowers, bracteate, villous and hirsute; bracts subtending involucre 11–20 (calyculus), helically alternate, spreading, leaflike, and spine-tipped (easily misinterpreted as outer phyllaries), 6.5–12 × 0.8–2.1 mm, with midvein raised on both surfaces and on lower surface whitish to midbract; **involucre** hemispheric, 6.5–11 mm diameter, phyllaries = ray flowers in 1–2 series, each phyllary folded lengthwise and enclosing a ray flower, 3.5–3.8 mm long, hirsute on outer surface along midvein, short-villous below tip on both surfaces, membranous on margins and ciliate above midpoint, with short spine at tip (cuspidate); receptacle initially flat becoming convex, 1.5–5.5 mm diameter, with bractlets (paleae) and bristlelike hairs, each palea subtending disc flower, ± folded lengthwise 3/4 length and forming a pocket enclosing disc flower (conduplicate), 3.7–5 mm long, ≥ disc flower, the triangular tip extending above pocket and commonly above corolla, ± fleshy, and sometimes with short spine, hairs surrounding palea to 1 mm long. **Ray flower:** pistillate, bilateral, ± 1.3 mm across; **calyx (pappus)** absent; **corolla** 2(–3)-toothed; tube cylindric, 1.1–1.6 × 0.4–0.5 mm, green, with inconspicuous short hairs; limb oblong, 3.7–4.2 × 1.2–1.6 mm, vivid yellow, teeth mostly obtuse, 0.2–0.3 mm long; **stamens** absent; **pistil** 1, ca. 4 mm long; ovary inferior, asymmetrically obovoid, ca. 1.5 × 0.8 mm, green (aging white then black), with short hooked attachment oblique at base, 1-chambered with 1 ovule; style 2-branched, 1.3–1.8 mm long below fork, grading from light green at base to vivid yellow below branches, the branches stigmatic, equal, 0.8–1 mm long, minutely papillate. **Disc flower:** functionally staminate (bisexual), radial, 1–1.3 mm across; **calyx (pappus)** absent; **corolla** 5-lobed, narrowly 2.5–3.3 mm long; tube ca. 0.5 mm long, pale yellow; throat 2.1–2.3 mm long, yellowish; lobes deltate to deltate-ovate, 0.5 × 0.4–0.5 mm, vivid yellow, papillate on margins; **stamens** 5, fused to top of corolla tube; filaments 0.7–1 mm long, pale yellow; anthers fused into cylinder surrounding style, basifixed, dithecal, 1.8–2 mm long, vivid to deep yellow and sometimes reddish brown on connective and narrow, sterile tip, longitudinally and inwardly dehiscent; pollen yellow; **pistil** 1, ca. 4

mm long, sterile (fertile); ovary inferior, narrowly obconic, $0.8-1 \times 0.4$ mm, with oblique attachment; style 2-branched, ca. 2 mm long below fork and yellow, the branches stigmatic, exerted, erect, 1.1–1.3 mm long, strong yellow, tapered to narrow tip, pubescent. **Fruit:** cypselae only of ray flowers or sometimes also several of disc flowers, somewhat dimorphic, loosely surrounded by phyllary or palea, lacking pappus; cypselae of ray flower \pm obovoid but straight on inner edge, with a subterminal style, $1.6-2 \times 1.8-2.1$ (sides) $\times 0.7-0.8$ mm, generally black or rarely grayish tan, \pm keeled on inner edge, the black cypselae finely textured, with an arching ridge from base of style down lateral faces to base, sometimes with 4–5 round to slightly transversely elongated bumps on outer face, sometimes wrinkled, the grayish tan cypselae very warty; cypselae of disc flower oblanceolate, $1.9-2 \times 0.6-0.8$ mm, grayish tannish with some elongated brownish cells, irregularly longitudinally ridged. Late June–early August.

Native. Annual to date known in range from one locality near Seminole Hot Springs (SMM), growing in a swale in full-sun with *Lepidium latipes*, adjacent to a clone of *Juncus balticus* var. *montanus*. *Centromadia pungens* subsp. *pungens*, as the name implies, has spine-tipped leaves and bracts (pungent). The head is surrounded by bracts (calyculus) that appear to the uninitiated observer to be spine-tipped outer phyllaries. Each phyllary encloses the ovary of a pistillate ray flower. Disc flowers initially appear bisexual, having exerted stigmas, but mostly the ovary is sterile (functionally staminate), although some heads produce occasional fruits from disc flowers. Cypselae that develop from ray flowers in our population are precociously formed before the disc flowers of the same head are shedding pollen, suggesting that perhaps they are apomictic.

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