

*Helminthotheca echioides* (L.) Holub, BRISTLY OXTONGUE. Annual or biennial herb, thick-taprooted, rosetted, 1(–several)-stemmed at base, branched throughout, ascending or erect (decumbent), 20–150 cm tall; shoots bristly with hirsute, rigid, and grapplelike hairs, the grapplelike hairs erect, 0.5–1.5 mm long, with 2–4 terminal hooks, the bristlelike hairs rigid and sharp-tipped, 1–2.3 mm long, with bulbous bases, old leaves rough; latex ± milky. **Stems:** low-ridged becoming cylindrical at base, to 9 mm diameter, with numerous ridges descending from each leaf, tough, mostly with grapplelike hairs but sparsely bristly along ridges; solid, pith white. **Leaves:** helically alternate, simple, petiolate (basal leaves) and sessile with clasping (fused to stem, amplexicaulous; cauline leaves), without stipules; petiole to 85 mm long, < blade, V-shaped to semicircular and winged in ×-section; blade of basal leaves oblanceolate, 100–370 × 25–80(–100) mm, long-tapered at base and grading into petiole, entire to remotely short-dentate to dentate on margins, acute at tip, pinnately veined with only midrib raised on lower surface, rough, hirsute and bristly, the bristles mostly along veins and on margins, the roughness due to scattered bulbous bases of bristly hairs becoming enlarged and wartlike; blade of cauline leaves oblanceolate to oblong or lanceolate to elliptic, 35–200 × 10–75 mm, cordate at base or tapered and then flaring into basal lobes, the basal lobes to 13 mm wide, clasping or sometimes fused to stem, coarsely toothed or shallowly lobed to inconspicuously dentate on margins or entire approaching inflorescence, obtuse to acute at tip, pinnately veined with only midrib raised on lower surface, dull, rough. **Inflorescence:** heads, in open, terminal and axillary cymelike arrays, head ligulate, 22–36 mm across, 25–70+ flowered, bracteate, very bristly with stiff hairs; axes striped with bristly hairs along shallow ridges; bract subtending lateral branch leaflike, narrowly triangular or lanceolate to elliptic-oblong with clasping base fused to axis, > 25 mm long, with short prickles on margins and along lower midrib; peduncle 10–50 mm long increasing 2× mm in fruit, hollow; bracts subtending involucre (3)5 (calyculus) in 1 whorl, leaflike, erect to ascending, unequal, ovate, 9–20 × 4–9 mm increasing slightly and spreading in fruit, green aging whitish and purplish, rounded to cordate at ± sessile base, entire often curved inward or outward, acute to acuminate and sometimes recurved at bristly tip, with grapplelike hairs on outer (lower) surface and hirsute to bristly on inner (upper) surface; **involucre** ± urn-shaped (concealed by subtending calyculus), 14–17 × ± 8.5 mm, of 3 distinct series of strongly heteromorphic bracts; outer phyllaries 8–13 in 2 series, inconspicuous when tightly appressed to inner phyllaries, awl-shaped to narrowly lanceolate, 2–5 mm long, with outer series of 3–5 ± opposite the larger inner series of 5–8 phyllaries; inner phyllaries 5 or 8, narrowly lanceolate, 10–12 × 2.3–3 mm, the widest at midpoint, strongly ridged or keeled at base, overlapping along narrowly to broadly membranous margins, acute at tip, exposed surfaces short-hairy, at anthesis upper portion purplish and having a hispid, raised midrib with an appendage 1–2 mm from acute phyllary tip, the appendage erect, 3–6.5 mm long, tapering to a bristle, each inner phyllary in fruit enclosing the ovary of a peripheral flower; receptacle flat, without bractlets (paleae), shallowly pitted, short-hairy in a polygonal pattern with ovary attachment in center of each polygon. **Ligulate flower:** bisexual, bilateral, 2–3 mm across; **calyx (pappus)** mostly of 20–25 feathery (plumose), flattened scales in 1 series, at anthesis 6–7 mm long, whitish, peripheral flowers with pappus fused at base, 1–1.5 mm long; **corolla** 5-lobed, 16–20 mm long; tube cylindrical, 5.6–7.2 × 0.5 mm, white, with scattered white hairs above midpoint; throat 0.5–1 mm long, yellow, with

yellowish hairs; limb ± strap-shaped, 10–14 × 2–3 mm, bright yellow, with 5 minute teeth at truncate tip, glabrous, faintly veined, the lower surface of outermost limbs with a broad, deep rose stripe below the middle 3 lobes and a narrower and shorter deep rose stripe below each lateral lobe; **stamens** 5, fused to corolla tube at base of throat, with anthers completely exerted; filaments = corolla throat, colorless or light yellow; anthers fused into cylinder surrounding style, basifixed, dithecal, 3.5–4 mm long, bright yellow, acutely lobed at base, acute to obtuse at tip, longitudinally dehiscent; pollen yellow; **pistil** 1, dimorphic with the peripheral pistils different from central ones; ovary inferior, beaked, the peripheral ones enclosed by phyllary ± kidney-shaped or arched, short-hairy or sometimes also densely short-pilose on exposed face, of the central flowers compressed-obovoid to ellipsoid, at anthesis 0.9–1.4 × 0.5–0.7 mm, greenish white, 5-veined, finely transverse ridged, glabrous; ovary capped with short inversely conic beak, at anthesis 0.3–0.5 mm long, green, with pale yellowish green to whitish **nectary gland** between base of pappus and style but lacking nectar; style exerted 2.5–4 mm beyond anthers, ± 13 mm long, whitish on portion below anthers, partly or completely yellow within anther column, deep purple or blackish beyond anthers or partially with anther column, upwardly barbed on exerted portion, 2-branched, the branches spreading becoming recurved, slender, 1.2–2 mm long, stigmatic along concave inner face. **Fruits:** cypselae in hemispheric cluster rimmed by horizontally spreading inner phyllaries, cluster 25–30 mm across, dimorphic; of peripheral flowers (± enclosed by inner phyllaries) fruit body slightly crescent-shaped, 2.8–3 mm long, light brown, short-hairy, with beak 4–5 mm long and pappus 2–3 mm long; of central flowers mummylike, compressed-oblong or compressed-lanceoloid, 2.5–2.8 × 1–1.1 mm, not ribbed, with many transverse ridges, chestnut brown, the beak slender, 4–5 mm long, flexible becoming fragile, with silvery white pappus, the pappus of subequal plumose scales, widely spreading to recurved, 4–7.5 mm long, scales free or fused at base in sets of 2–4, the free portion above midpoint barked with long, fine hairs but not plumose. Mid-December–mid-October.

Naturalized. Annual weed, common and widespread throughout the range, appearing in disturbed roadside and other ruderal sites and grassy habitats. The common name of *Helminthotheca echioides* is oxtongue, which perfectly describes the rough feeling of the leaf blades. The tops of the plant are very bristly or rough, and sometimes are almost spinescent when the organs have dried. *Helminthotheca echioides*, formerly known as *Picris echioides*, has a distinctive whorl of bracts (calyculus), which resembles a series of outer phyllaries, and formerly was treated as outer phyllaries. This species has two forms of fruit dispersal; the majority of cypselae are wind-borne by pappus elevated on a beak, for long-distance dispersal, whereas the outer five (eight) have diminutive pappus and then days after drop to the base of the plant enclosed by an inner phyllary.

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