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ERYNGIUM PENDLETONENSIS (APIACEAE), A NEW SPECIES FROM SOUTHERN CALIFORNIA

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Abstract

Eryngium pendletonensis (Apiaceae) is a new species from Camp Pendleton Marine Corps Base, San Diego County, CA. It occurs in seasonally moist grasslands, swales, and vernal pools on coastal slopes and mesas and is distinguished from other species of Eryngium sect. Armata in having a combination of flower bracts with thickened margins, pinnately divided leaves, and short, central primary stem axes.


Eryngium pendletonensis K. L. Marsden & M. G. Simpson, sp. nov.—Type: USA, California, San Diego Co., Camp Pendleton Special 1-DMATC series V795S ± 10°, Camp Pendleton Marine Corps Base, bluffs just south of Las Pulgas Creek (Red Beach), 15 m (50 feet) north of the Harrier Pad at Red Beach, disturbed grassland habitat on an eroding coastal bluff, 33°17’09”N, 117°27’17”W, 30 m (100 feet) elevation, 13 Jun 1992, K. L. Marsden 13V1924 (holotype: SD 142272; isotypes: BCMEX, CAS, DAV, LA, MO, RSA, SDSU, UC, UCR, UCB, US).

Differt a Eryngio pinnatisecto indumentis minus scabris, habitibus prostratis, axibus primariibus brevioribus (1–6 cm), et floribus capitulorum paucioribus.

Plants herbaceous perennials, 0.5–2 dm tall; growth apparently colonial, several individuals often clumped together giving the appearance of one plant, clumps up to 5 dm in diameter; roots fasci- culated, adventitious, arising from a short, erect rootstock; rootstock (a caudex) brown, as wide as long, 5–10 mm, giving rise to basal leaves at apex, slightly thickened relative to aerial stems; aerial stems a central primary axis (continuous with rootstock) plus (0–)1(–2) lateral primary axes arising from apex of rootstock (Fig. 1); central primary axis erect, 1–6 cm long at maturity (Fig. 5); branching of primary axes dichasial, at apex giving rise to two cauline leaves, a terminal pedunculate head, and (1–)2 secondary axes; dichasial pattern repeated up to 6 times in secondary and subsequent axes (Fig. 1); all aerial axes ribbed, ribs scaberulous; leaves basal and cauline; basal leaves arising from apex of rootstock, sheathing, crowded; first 3–7 leaves typically linear to acicular, unlobed, with transverse sepa; later leaves pinnately to bipinnate-ly divided (Figs. 2B, 3A), 8–25 cm long, oblanceolate in outline, sepalate only in petiole region, ascending at first, drooping with maturity, withering or senescing prior to or at the onset of flowering; leaf lobes mostly narrowly elliptic to lanceolate, often apiculate at maturity; cauline leaves opposite, resembling basal leaves but not sepalate, size diminishing with distance from rootstock; inflorescence a pendunculate, congested head (Fig. 2C), inflorescence bracts absent, flowers 9–19 per head, head size (including number of flowers) diminishing with distance from rootstock; peduncles 2–3 cm long; flowers bisexual, actinomorphic, erect, sessile, 3–4 mm long (Fig. 2D); flower bracts (Figs. 2C, D, 4) 5–21 mm long (decreasing in size from 1. Current address: U.S. Fish and Wildlife, 2730 Loker Ave. West, Carlsbad, CA 92008.

Fig. 1. Diagram of Eryngium pendletonensis growth habit. Note that axes actually have a sprawling, not erect, habit.
base to apex of head), sessile, narrowly triangular to lanceolate, flat to conduplicate, apically acuminate-spinose, margins entire, thickened, abaxial surfaces mostly with very sparse to dense, minute scabrosity, especially along the veins, with white membranous basal sheaths at lower third, sheaths open, wrapping around the ovary, margins sometimes overlapping; perianth dichlamydeous, imbricate; calyx aposepalous, approximately 2 mm long, green; sepals oblong to ovate, 1-veined, with widely scarious margins, each apex with an apiculate process (Fig. 2E, F); corolla apopetalous; petals ca. 1 mm long, white, membranous, delicate, caducous, 1-veined, surface folded along central vein such that abaxial surfaces face one another (reduplicate); apex incurved to near petal base, ending in 2 elongate appendages; folded surfaces forming fimbriate lobes at mid-region (Fig. 2E, F); androecium uniseriate; stamens 5, apostemonous, whorled, antisepalous; filaments incurved early in development, extended and ca. 2.1 mm long at maturity; anthers yellow, narrowly oblong, thecae angled in cross-section, basifixed, longitudinally dehiscent; ovary inferior, 1–1.2 mm long, obovoid, slightly angled, covered with overlapping, hyaline scales persistent in fruit; carpels and locules 2; placentation apical-axile; ovules 1 per carpel; stylopodium low, 2-lobed; styles 2, ascending; stigmas terminal, obscure; fruits oblance-ovoid, prismatic, 5-angled and ribbed; scales lanceolate to lance-ovate, acuminate,
variable in size (Fig. 2G); cotyledons linear. Chromosome number: 2n=16 II (counted at metaphase I of microsporogenesis; equivalent to 2n=32; see Strother & Nesom 1997).

Paratype. Near Oceanside, southern California, 16 Apr 1902, G. B. Grant, s.n., (DS 129228).

Distribution, habitat, phenology, and rarity. Eryngium pendletonensis is a narrow endemic to San Diego County, CA, in ca. 25 square kilometers (9 square miles) of Camp Pendleton Marine Corps Base (ranging within 33°21'04"–33°33'11"N; 117°23'27"–117°31'40"W), where it occurs along exposed coastal bluffs (Fig. 2A) and grasslands. Clay soils of the Huerhuero series (Bowman 1973) are the substrate type. The vegetation type of the surrounding area is disturbed native grassland or sparse Coastal Sage Scrub. Common associates include Artemisia californica Less., Dudleya blochmaniae (Eastw.) Moran, Hemizonia fasciculata (DC.) Torrey & A. Gray, Lasthenia californica Lindley, Chlorogalum parviflorum S. Watson, Linanthus dianthiflorus (Benth.) E. Greene, Isocoma menziesii (Hook. & Arn.) G. Nesom, Grindelia camporum E. Greene var. bracteosum (J. Howell) M. A. Lane, Sisyrinchium bellum S. Watson, Brodiaea filifolia S. Watson, Juncus bufonius L., Nasella pulchra (A. Hitchc.) Buckworth, Vulpia myuros (L.) C. Gmelin, Avena barbata Link, and Bromus spp.

Plants flower from April to June. Flowering is diurnal and is roughly synchronous within a population. Heads remain largely intact in fruit. Small beetles, flies, native bees, and wasps have been observed visiting the flowers.

Factors contributing to the rarity of Eryngium pendletonensis include its narrow habitat specificity and small geographic range. The species has a patchy distribution and can be locally abundant within subpopulations. Although no population trend data are available, ongoing military training activities pose a threat to this species. Populations that occur on the coastal bluffs are especially at risk.

**Fig. 4.** Eryngium pendletonensis flower bracts. A. Outer flower bract, side view, adaxial at left. B. Outer flower bract, adaxial side facing. C. Inner flower bract, flattened to show scarious base, adaxial side facing. D. Outer bract cross-section at mid-region, showing thickened margins.

**Fig. 5.** Primary axis length (in centimeters) of E. pendletonensis (sample size = 42 individuals) and E. pinnatisectum (sample size = 23 individuals). Means = ○; ranges = ±; bars = ±1 standard deviation of the mean.


1. Bracts and bractlets very rigid, margins gen entire, prominently thickened
   2. Lf unlobed, margin gen sharply serrate to irregularly cut
   3. Lf pinnately to bipinnately lobed

4. Bracts and bractlets very rigid, margins gen entire
   5. Lf unlobed, margin gen sharply serrate to irregularly cut
   6. Lf pinnately to bipinnately lobed

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6. Pl erect, silvery, primary stem axis 7–32 cm; n&c SNF ................. *E. pinnatisectum*
6' Pl sprawling, greenish, primary stem axis 1–6 cm; SCo. ................. *E. pendletonensis*
4' Bracts and bractlets ± flexible, margin gen sharply toothed, not thickened

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LITERATURE CITED


