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A NEW SPECIES OF BUTTON-CELERY (*ERYNGIUM*, APIACEAE) FROM CALIFORNIA

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ABSTRACT

Eryngium montereyense D.W. Taylor & R.E. Preston, **sp. nov**., is described from the Monterey Bay region of central coastal California. The new button-celery occurs in vernal pools at Fort Ord National Monument, which until recently was inaccessible for botanical survey. The new taxon differs from the parapatric *E. armatum* of coastal prairie in its smaller size, prostrate habit, lobed linear leaves, and vernal pool habitat.

Eryngium L. is the largest genus in the Apiaceae, consisting of about 250 species (Calviño et al. 2008). The North American species are included within *Eryngium* subg. *Monocotyloidea* Wörz emend. Calviño & Downie, members of which are found primarily in semi-aquatic habitats (Calviño et al. 2008). Currently, 13 species and 16 terminal taxa are known to occur in California, most of which are found in vernal pools and associated grasslands and swales (Preston et. al. 2012).

Vernal pools of the California Floristic Province are seasonal wetlands largely centered on Pleistocene alluvial terraces in the Great Central Valley or in other low elevation (<1500 meters) geomorphic settings yielding depressions with restricted drainage throughout the Province, including in Baja California (Solomeshch et al. 2007). In the California flora, vernal pools support speciose endemic lineages, including *Eryngium* (Apiaceae) and many other genera scattered across phylogenetically distant higher plant families, e.g. *Downingia* (Campanulaceae), *Lasthenia* (Asteraceae), *Plagiobothrys* (Boraginaceae), *Pogogyne* (Lamiaceae), *Navarretia* (Polemoniaceae), *Juncus* (Juncaceae), and Poaceae tribe Orcuttieae (*Orcuttia*, *Tuctoria*, and *Neostapfia*).

During the course of field surveys at Fort Ord National Monument, the first author recognized that the diminutive *Eryngium* plants growing in vernal pools and swales were different from *Eryngium armatum* (S. Wats.) Coult. & Rose, which was growing in adjacent grasslands. He brought the specimens to the attention of the second author, who concurred that these plants represent an undescribed species.

ERYNGIUM MONTEREYENSE D.W. Taylor & R.E. Preston, **sp. nov**. **TYPE**: **USA. California.** Monterey Co.: Fort Ord, N of and along Eucalyptus Road 0.4 road mi E of junction with Watkins Gate Road, situated roughly equidistant between Leary Hill and Merrill's Hill, 27 May 2016, *D.W. Taylor 21690* (holotype: JEPS131680, isotypes: CHSC, RSA) (Fig. 1).

Figure 1. *Eryngium montereyense*, holotype, *Taylor 21690* (JEPS).

Allied with *Eryngium armatum*, *E. pinnatisectum*, and *E. pendletonensis*, with which it shares the character of entire capitular bracts with thickened margins and mid-ribs, but different in its decumbent habit, linear basal leaves that are entire or with short teeth, and smaller capitules.

Perennial herb from a rootstock bearing fasciculate, thickened, black fibrous roots. **Stem** main axis 10–15 mm long, dichasium diffusely branched, with 8–15 branches, branches weak, spreading, decumbent or mostly so, entirely glabrous, 10–15 cm long. **Leaves** basal septate throughout, the basalmost somewhat sheathing, filiform, 2–3 mm diameter, entire or with few short teeth, teeth 4–8 mm long (Fig. 2); subsequently distal basal leaves up to 16 mm long, with lamina linear, < 5 mm wide, distally expanding up to 8 mm wide, pinnate, with short linear teeth; prophylls opposite, to 5 cm long, petioles poorly differentiated from the blades, coarsely serrate with teeth 4–9 mm long, teeth with spinulose tips, distally with bony, achlorophyllous, thickened margins. **Capitules** 9–12 mm diameter, 5–12 flowered; bracts entire, margins thickened, bony and achlorophyllous, the abaxial midrib scaberulous-papillate, each subtending a single flower, 5–9 mm long, 1.5–2.5 mm wide proximally, flat to moderately conduplicate, with basal scarious lateral extensions that wrap around the ovary, these to 0.5 mm wide in the inner whorls. **Flowers** bisexual, actinomorphic, sessile, 3–4 mm long; sepals green, lance-ovate, ca. 2 mm long, the apex apiculate; stamens 5, filaments ca. 1 mm long, anthers white, 0.5 mm long; petals white, oblanceolate, 0.5-1 mm long and up to 0.5 mm wide; stylopodium brownish, 2-lobed; styles 2, ≤ to the sepals in length, 1.4–1.8 mm long, stigmas terminal; ovary inferior, beset with imbricate hyaline scales persistent in fruit. **Fruit** 1.5–3 mm, mericarp 1.25–2 mm, 1–1.5 mm wide, scales colliculate, glabrous or pubescent with short stiff hairs, distally lance-attenuate, proximally abruptly reduced, conical (Fig. 3).

Figure 2. *Eryngium montereyense*, detail of basal leaves in plants in cultivation. Photo by Dean Taylor, 02 November 2016.

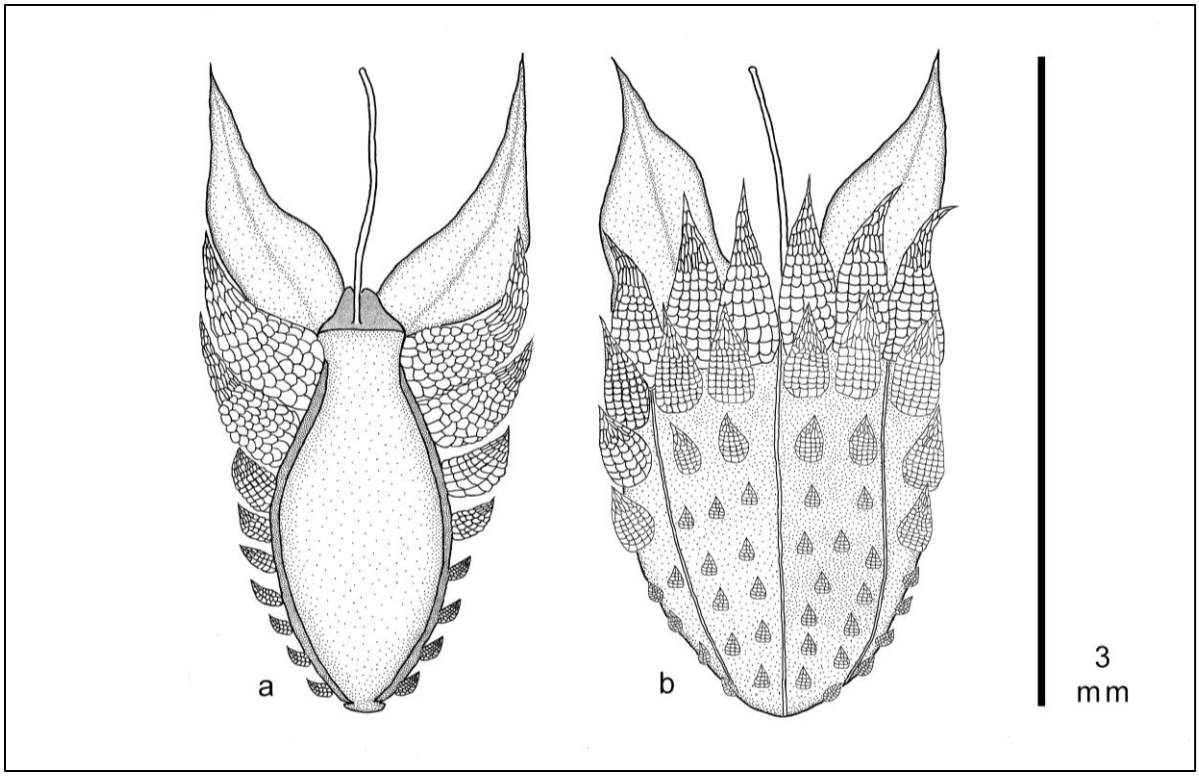

Figure 3. Mericarp of *Eryngium montereyense*. a. Adaxial view. b. Abaxial view. Drawn from *Preston 3233.*

Additional specimens examined. California. Monterey Co.: Fort Ord: Machine Gun Flats, 5 May 2009, *Solomeshch s.n.* (DAV); Mary's Valley, 8 May 2009, *Solomeshch s.n.* (DAV); Henniken Flats, 7 Jun 1987, *Yadon s.n.* (PGM); grown from seed collected 0.3 mi NE of the jct Eucalyptus Rd and Parker Flats Cut-Off, 23 Jun 2019, *Preston 3233* (DAV).

Etymology. *Eryngium montereyense* is named to indicate the geographic limitation of the taxon, mirroring the etymology of *E. pendletonense* Marsden & Simpson, another coastal narrow endemic. We suggest the common name "Fort Ord button-celery" for this species.

Geographic distribution. The geographic range of *Eryngium montereyense* is confined to a range extent of approximately 50 km^2, with an area of occupancy of no greater than 1 km^2, entirely within the confines of the Fort Ord National Monument. In this region, there are about 60 vernal pools, approximately 34 acres in total (U.S. Army Corps of Engineers 1996; U.S. Fish and Wildlife Service 2005). Various unpublished consultant reports list *Eryngium* from 6 pools, mostly unvouchered.

Eryngium montereyense becomes the third narrow endemic to be discovered on the former military base, following *Agrostis lacuna-vernalis* Peterson & Soreng (Peterson et al. 2011) and *Chorizanthe minutiflora* Morgan, Styer, & Reveal (Morgan et al. 2014). Given that previously botanical surveys at Fort Ord were limited by restricted access and because sizeable areas of the current Fort Ord National Monument remain access-restricted by unexploded munitions, further field work on this site has the potential to discover additional undescribed taxa.

Conservation status. *Eryngium montereyense* is rare, known from only two or three occurrences at Fort Ord National Monument. Based on this level of rarity, the species warrants a NatureServe Ranking (Faber-Langendoen et al 2012) of G1/S1 (Critically Imperiled at the Global and State level) and a California Rare Plant Rank of 1B.1 (Rare and Endangered in California and

elsewhere, seriously threatened in California) (California Natural Diversity Database 2022). Potential threats include activities associated with explosive ordinance removal and decreased rainfall associated with climate change.

Habitat. *Eryngium montereyense* occurs in seasonally moist wetland swales and vernal pools vegetation (Figs. 4, 5). Limited information is available about vernal pools in the Central Coast region, but vernal pools at Fort Ord are on marine sediments, and some have been degraded from military activities and overgrazing (Keeler-Wolf et al. 1998). Dominant species observed in vernal pools at Fort Ord include *Eleocharis macrostachya*, *Plagiobothrys tenellus*, and *Lasthenia conjugens* (Tannourji 2009). Uplands in the vicinity, which grow on a nutrient-poor substrate of consolidated inland marine sand, include grasslands, coast live oak woodlands, and maritime chaparral of *Arctostaphylos pumila*, *A. hookeri* var. *hookeri*, *A. pajaroensis*, and *A. montaraensis* (Griffin 1978).

Taxonomic relationships. The California species of *Eryngium*, together with *E. petiolarum* of Oregon and southern Washington, comprise *Eryngium* sect. *Indiana* Wolff subsect. *Armatum* Wolff. Wolff (1913) was ambiguous about whether to treat subsect. *Armatum* as a section or subsection. Sheikh (1978) concluded that recognition of sect. *Armatum* was warranted, although he never published the rank change. Subsequently, Calviño et al. (2008, 2010) found that neither sect. *Indiana* nor subsect. *Armata* are monophyletic, and support for infrageneric ranks in *Eryngium* will require additional data.

Figure 4. Habitat of *Eryngium montereyense* at type locality on Fort Ord National Monument. Photo by Dean Taylor, 27 May 2016.

Figure 5. *Eryngium montereyense* in situ at type locality. Photo by Dean Taylor, 27 May 2016. Individual plants are marked with a red "X".

Eryngium montereyense is similar to three other species, *E. armatum*, *E. pendletonense* and *E. pinnatisectum*, all of which are characterized by unlobed capitular bracts with thickened, spineless margins (Preston et al. 2012). *Eryngium armatum* is the most widespread of the four species, being distributed along coastal California from Humboldt County to San Diego County, where it grows in grasslands and meadows on coastal bluffs and terraces. *Eryngium pinnatisectum* occurs on vernally wet clay or adobe soils along swales and streambanks in the central and northern Sierra Nevada foothills. *Eryngium pendletonense* grows on exposed coastal bluffs and grasslands on clay soils, with adjacent vegetation consisting of disturbed native grasslands and coastal scrub, in northern San Diego County (Marsden & Simpson 1999). Like *E. montereyense*, *E. pendletonense* is restricted to a small area within a military base (Camp Pendleton).

In the first edition Jepson Manual treatment of *Eryngium* (Constance 1993), *Eryngium montereyense* would key to *E. pinnatisectum.* In the second edition Jepson Manual treatment (Preston et al. 2012), *E. montereyense* would key to *E. pendletonense* on the basis of pinnately-lobed leaves and decumbent habit. A modified key to differentiate between these four species is provided below. An additional character useful to differentiate *E. montereyense* from these other taxa is inflorescence head size: *E. montereyense* capitules are smaller (≤ 13 mm), with substantially fewer flowers, compared to those of the other three species (15–50 mm).

Key to *Eryngium* species (modified from Preston et al. 2012)

1. Capitular bracts lobed or unlobed, margins not thickened, at least outer generally with spines ..... **E. aristulatum** et al.
1. Capitular bracts unlobed, margins thickened (these non-green and hardened), marginal spines 0.

2. Leaf generally unlobed, margin sharply serrate to irregularly cut, not pinnatifid; Coastal California ..... **E. armatum**
2. Leaf pinnately to bipinnately lobed.

3. Plant erect, silvery; main stem branched 7–32 cm distal to rosette; n & c Sierra Nevada Foothills ..... **E. pinnatisectum**
3. Plant decumbent, ± green; main stem branched 1–6 cm distal to rosette; coastal California.

4. Basal leaves pinnate with long linear lobes to bipinnate; capitules ≤ 40 mm; mature styles > sepals; South Coast (San Diego Co.) ..... **E. pendletonense**
4. Basal leaves pinnate with short linear to lanceolate lobes; capitules ≤ 13 mm; mature styles ≤ sepals; Central Coast (Monterey Co.) ..... **E. montereyense**

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