

A NEW SPECIES OF EUPATORIUM (ASTERACEAE) FROM CALIFORNIA

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Eupatorium (Asteraceae, Eupatorieae) is a highly diverse and widespread group of well over 1000 taxa. Numerous species are found in the American tropics, and the genus is well represented in the floras of more northerly areas of the globe, including North America. However, California is relatively depauperate in members of this large and complex genus, with only two native species recorded by Munz (1959). Consequently, the existence of a new, highly distinct, and narrowly endemic member of the genus in the state is of considerable interest.

Eupatorium shastense Taylor & Stebbins, sp. nov.; a *E. occidentale* differt foliis basi opposita, folia caulina alterna. Capitulum plerumque solitarium, terminale. Flores albae. (Fig. 1)

Perennial herb from woody, enlarged or occasionally rhizomatous base. Stems clustered, 1.5–4.5 dm long, puberulent to pubescent, often with some glandular hairs above. Leaves opposite at base, alternate above; the juvenile orbicular, entire to slightly dentate; the adult ovate, obtuse to truncate at base, acute to acuminate at tip, coarsely serrodentate, often ciliate on margins with short hairs 0.3–0.9 mm long, glabrous to puberulent on laminar surfaces. Petioles 4–6 mm long, blades 15–31 mm long, 11–20 mm wide. Capitula mostly solitary (1–3) at ends of branches, often subtended by a small leaf-like bract, 12–16 mm diameter when pressed. Phyllaries 9–13, green, often ribbed at base, in two series, glabrous to pubescent. Phyllaries glabrous to pubescent, 9–14 mm long, 1.1–2.5 mm wide. Flowers all tubular, 30–60 per capitulum. Corollas 5–8 mm long, white. Style branches clavate, elongate, 3–5 mm long, with short stigmatic lines; appendage elongate, papillate. Achenes brown to black, puberulent to pubescent, 3.0–5.5 mm long, 5-nerved. Pappus of 20–40 whitish barbellate bristles. Chromosome number $n = 17$.

TYPE: CA, Shasta Co., 1.6 km E of Squaw Creek, T35N R2W (MDM), 762 m. *Stebbins & Ehrendorfer 5968*, 20 Jun 1959, Holotype (UC). Isotypes: MO, NY, GH, DAV.

Additional specimens examined: CA, Shasta Co., Shasta Lake, McCloud Arm opposite Bailey Cove, 487 m, on North Gray Rocks, *Stebbins and Gajewski 5949*, 18 Oct 1959 (UC, DAV); Devil's Rock, S28 T35N R2W, 670 m, along Low Pass Creek, *Stebbins 6177*, 9 Sep 1967 (DAV); N face Hirz Mt., S7 T35N R3W, 1066 m, *Taylor 2409, 2410*, 1 Jul 1972, chromosome voucher 2430, 1 Jul 1973 (DAV).

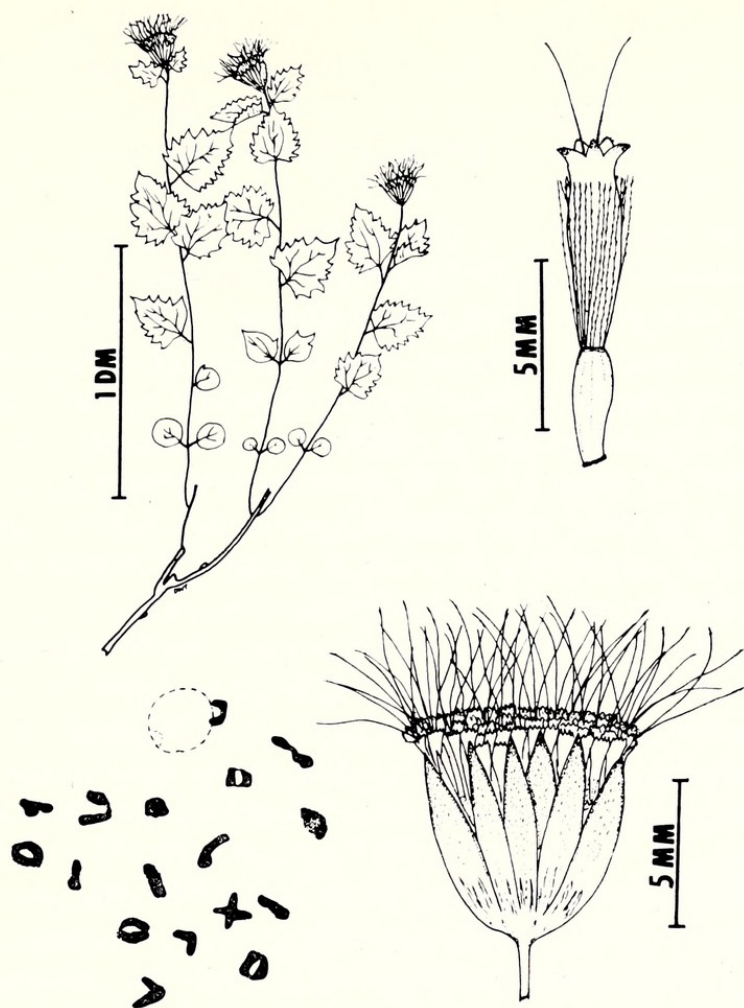


FIG. 1. *Eupatorium shastense*. Upper left: habit of plant. Upper right: detail of corolla. Lower left: camera lucida drawing of chromosome voucher $\times 3100$. Lower right: detail of single capitulum.

Eupatorium shastense is obviously related to the more widespread *E. occidentale* Hook., because these two taxa are similar in a number of vegetative characters. Both have numerous clustered stems that arise from an enlarged woody base and have very similar foliage and canopy architecture. Heteroblastic leaf development is typical of nearly all individuals of *E. shastense* observed, but this character is either absent or of rare occurrence for *E. occidentale*. The most striking differences separating these two species are characters of the capitulum. *Eupatorium shastense* has a solitary, terminal capitulum (occasional individuals possess a single subtending pair), whereas *E. occidentale* typically has >18 capitula in a terminal corymbose cluster. The capitula of *E. shastense* are larger in most dimensional characters than those of *E. occidentale*, and the corollas of *E. shastense* are invariably white whereas the corollas of all *E. occidentale* we have observed are tinged with purple. *Eupatorium shastense* differs significantly at the 0.05 level of probability (based on *t* statistic comparisons) from *E. occidentale* for the following characters:

capitula per branch, capitulum width when pressed, and corolla width when pressed. The large, solitary heads of *E. shastense* are somewhat reminiscent of several species of *Brickellia*, but the 5-nerved achenes and chromosome number of $n = 17$ of the former show that this resemblance is superficial.

Eupatorium shastense is a strict calcicole, being restricted to nearly vertical limestone cliffs of the Hosselkus formation from 450 to 1200 m between the Pit and McCloud river drainages in Shasta County. Plants of *E. shastense* establish on these cliffs wherever there is sufficient soil or organic matter lodged in cracks or on ledges to support their growth. *Eupatorium occidentale* and *E. shastense* are sympatric at all populations of the latter known to us. Ecologically, the two taxa occupy different habitats at a given site. *Eupatorium occidentale* occurs as an understory herb in rocky sites in a dense woodland dominated locally by *Pseudotsuga menziesii*, *Pinus ponderosa*, *Quercus chrysolepis*, and *Q. garryana* var. *breweri*. Plants of *E. occidentale* are absent from the vertical cliffs that are occupied by *E. shastense*. Elsewhere, *E. occidentale* is often a plant of cliff-faces, but it is not a strict calcicole. At all populations studied, no individuals of *E. shastense* have been found in the seemingly more favorable habitats in the surrounding woodland occupied by *E. occidentale*.

The Hirz Mountain population of *E. shastense* was surveyed during the summers of 1972–1975. The population during this period was stable and consisted of less than 100 individuals. Other known populations of the new species are similarly small. Individuals in small size-classes were observed in sufficient numbers on Hirz Mountain to suggest a stable population size.

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