

A NEW COMBINATION IN *CHORIZANTHE ROBUSTA* C. PARRY
(POLYGONACEAE: ERIOGONOIDEAE) FROM CALIFORNIA

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ABSTRACT

A new combination, *Chorizanthe robusta* var. *hartwegii*, based on *C. douglasii* var. *hartwegii* Benth. in DC., is proposed. The plant is a highly restricted endemic known only from three populations near Scotts Valley in the Santa Cruz Mountains of Santa Cruz Co., California, where it is found only on bare patches of exposed bedrock in isolated annual grasslands. It differs from the var. *robusta* in its consistently erect habit and rose-pink rather than white involucre lobes.

KEY WORDS: Polygonaceae, taxonomy, *Chorizanthe*, California.

INTRODUCTION

In a recent revision of the annual species of *Chorizanthe* (Polygonaceae: Eriogonoideae), Reveal and Hardham (1989) showed that the pink-involucered expression from the Santa Cruz Mountains termed *C. pungens* Benth. var. *hartwegii* (Benth. in A. DC.) Goodman in the more recent monographic and floristic literature was undescribed. They named the plant *C. pungens* var. *hartwegiana* Rev. & Hardham. As for the var. *hartwegii*, they considered it to be an erect, rose-pink-involucered expression of *C. robusta* C. Parry, an otherwise white-involucered plant of coastal or near coastal central California.

In an effort to discern the significance of var. *hartwegii*, the senior author attempted, but failed, to relocate the plant. Without adequate material, no differentiation was proposed and var. *hartwegii* was placed in synonymy. However, even as the revision was being published, the junior author of the present paper was studying the long-lost plant in the field and recognizing its distinctiveness from *C. robusta*.

An examination of the new material proved the taxon occurred in "dry mountain pastures" as stated by Hartweg, and confirmed the just proposed suggestion that the plant indeed belonged to the *Chorizanthe robusta* complex rather than to *C. pungens*. The new observations also provided evidence that the unusual involucre color and the erect habit are consistent features.

Preliminary transplant studies seem to indicate that the degree of pink colorization of the involucral lobes is related to light intensity. All plants in the wild occur only in full sun and consistently have rose-pink involucre. This coloring is more intense than that of the pink-flowered *C. pungens* var. *hartwegiana* which occurs in great abundance on sand deposits to the west, and is comparable to that of *C. douglasii* to the south in Monterey County. By contrast, involucre of the var. *robusta* are white, regardless of light intensity.

TAXONOMY

Chorizanthe robusta C. Parry var. *hartwegii* (Benth. in A. DC.) Reveal & Morgan, comb. nov., based on *C. douglasii* Benth. var. *hartwegii* Benth. in DC., Prodr. 14: 26. 1856. — TYPE: dry mountain pastures near Santa Cruz, Santa Cruz Co., California, 1847, Hartweg 1935 (holotype: K!; isotypes: BM, BR, CGE, G, GH, K, MO, OXF!). — *Chorizanthe pungens* Benth. in A. DC. var. *hartwegii* (Benth. in A. DC.) Goodman, Ann. Missouri Bot. Gard. 21: 37. 1934.

Erect villous annual herbs (0.5) 1-3 dm high and (0.1) 1-2.5 dm across; leaves mostly basal, oblanceolate, the blades 1.5-5 cm long, 3-7 (10) mm wide, villous, tapering to a villous petiole 1-4 (7) cm long; inflorescences cymose with the secondary branches not suppressed except in the terminal clusters of involucre; bracts 2, opposite, similar to the leaves at the lower nodes only more reduced, 2-5 cm long and 2-5 (7) mm wide, short petiolate, becoming linear-oblanceolate to linear and acuminate above, aciculate; involucre solitary, the tube cylindrical, 3-angled but 6-ribbed, 2.5-3.5 mm long, pubescent with long villous hairs, the margins thin, rose-pink and restricted to the basal portion of the teeth, the teeth spreading, the uncinat awns of two sizes, the larger ones 0.7-1.3 mm long with the anterior one mostly 1-1.3 mm long, these alternating with the smaller ones 0.3-0.7 mm long; flowers slightly exerted beyond the involucre, cylindric, 2.5-4 mm long, the tube white, the lobes pink to rose, pubescent without along the midribs with the hairs typi-

cally extending beyond the apex, on pedicels 0.2-0.4 mm long, the tepals monomorphic, oblanceolate to narrowly oblong, mostly rounded and erose apically, united about a quarter of their length; *stamens* 9, included, the filaments 2-3.5 mm long, glabrous, the anthers 0.6-0.8 mm long, oblong, red or maroon; *achenes* light brown, 3.5-4 mm long.

Dry rocky to sandy outcrops in annual grassland islands in the Santa Cruz Mountains near Scotts Valley, Santa Cruz Co., California, from 750-800 ft elev; flowering from (Apr) May-Jun (Jul).

Specimens Examined: UNITED STATES. CALIFORNIA: Santa Cruz Co.: S of "Cupcake Hill," beyond W end of Casa Way, Scotts Valley, 28 Apr 1989, *Morgan 1562* (MARY); S slope of "Reservoir Ridge" between Tabor Drive and Glenwood Drive, Scotts Valley, 3 May 1989, *Morgan 1585* (CAS, MARY); N of Casa Way, Scotts Valley, 24 May 1989, *Morgan 1619* (MARY); "Santa's Village meadow," N of Navarra Drive, Scotts Valley, 7 Jun 1989, *Morgan 1650* (MARY); Santa Cruz Mountains, 13 Jul 1882, *Pringle s.n.* (F, G, LE, MIN, MPU, NY, PENN, US, VT, WU).

Three populations of *Chorizanthe robusta* var. *hartwegii* are known. All are located within about one and a half kilometers of each other in fragmented islands of annual grassland extending over some three hundred acres. Mixed evergreen woodlands occur on three sides with urban development to the south. All three sites are located near the northern end of Scotts Valley and are wholly or primarily within the city limits.

The westernmost population is the largest and consists of several thousand individuals in a roughly triangular-shaped area of approximately 40 acres. It is found to the west of Glenwood Drive within and just outside the city limits of Scotts Valley, and extends from Casa Way northward along the foot of a low escarpment. This population, herein termed the Casa Way population, may be differentiated into three subpopulations on the basis of the substrate and associated species.

The southeastern subpopulation, immediately north of Casa Way, is the most distinctive. Plants of var. *hartwegii* are associated with bare patches of Santa Cruz Mudstone in the midst of gentle, grassy slopes. There is no "soil" on these mudstone barrens, the surface being covered with a thin layer of finely pulverized, whitish mudstone. The var. *hartwegii* occurs with *Arenaria californica*, *Lasthenia chrysostoma*, *Trifolium grayi*, *T. depauperatum*, *Lepidium nitidum*, *Hemizonia corymbosa* and a few other less obvious annual herbs. In early spring, these patches stand out conspicuously from the surrounding grasslands because of the yellow *Lasthenia*; later in the spring this is replaced by the duller yellow of the *Hemizonia* and the rose-pink of the *Chorizanthe*.

The southeastern subpopulation occurs on exposed bedrock outcrops of the Purisima Formation that slopes to the west. Associated species include *Arenaria douglasii*, *Trifolium albopurpureum*, *Gilia clivorum*, *Lomatium caruifolium*, *Calochortus luteus*, *Clarkia purpurea*, *Corethrogyne filaginifolia*,

Trichostema lanceolatum, *Silene gallica*, *Filago gallica* and *Vulpia*.

The northern subpopulation extends along the eastern base of an escarpment of Purisima Sandstone. The var. *hartwegii* is growing on loose sand at the foot of the slope in association with *Trichostema lanceolatum*, *Lotus purshianus*, *Corethrogyne filaginifolia*, *Navarretia atractyloides*, *Erodium botrys*, *Filago gallica* and *Vulpia*.

The second population consists of less than a thousand individuals scattered over an area of approximately one acre. It is found on a relatively bare, south-facing slope composed of Santa Cruz Mudstone located north of Vine Hill School on the east side of Glenwood Drive. This colony is herein termed the Vine Hill population. The var. *hartwegii* is associated with *Corethrogyne filaginifolia*, *Lotus purshianus*, *Erodium botrys*, *Silene gallica*, *Filago gallica*, *Gastridium ventricosum*, *Bromus mollis* and *Vulpia*. Unlike the Casa Way population which is no longer grazed, the Vine Hill population currently is lightly grazed by horses.

The easternmost population is on a mudstone-based "flower field" dominated by *Lasthenia chrysostoma*, *Trifolium grayi*, *T. depauperatum*, *T. albopurpureum*, *Orthocarpus densiflorus*, *Lepidium nitidum*, *Lupinus nanus*, and other annual herbs. The Polo Ranch population, as it is termed here, consists of approximately one thousand individuals with the majority concentrated on a three acre site, in close association with *Arenaria californica*. At present, this colony is heavily grazed by horses during the late spring and summer, but without any apparent detriment to the long-term survival of the var. *hartwegii* or the other native annuals.

Three related entities occur near the known colonies of *Chorizanthe robusta* var. *hartwegii*. All of these are on sands derived from the Santa Margarita Formation and are associated with chaparral rather than grassland. The most common is *C. pungens* var. *hartwegiana* which is found on deep moving sand about one kilometer north of var. *hartwegii*. About four kilometers to the west (in addition to large populations of *C. pungens* var. *hartwegiana*) is the less common *C. diffusa* Benth. in A. DC. To the south is the rare var. *robusta*, about five kilometers distant from the nearest population of var. *hartwegii*.

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