

*PENTACHAETA AUREA* SUBSP. *ALLENII* (ASTERACEAE), A NEW SUBSPECIES  
FROM ORANGE COUNTY, CALIFORNIA

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ABSTRACT

*Pentachaeta aurea* Nutt. subsp. *allenii* Keil is described as new. It is apparently endemic to southwestern Orange Co., California. Lamina tips of ray corollas of living specimens of the plants are pale yellow in early morning but turn brilliant white after 1–2 hr in sunshine; laminae of subsp. *aurea* are solid yellow.

Key Words: Asteraceae, Limestone Canyon Wilderness Park, Orange County, *Pentachaeta aurea* subsp. *allenii*.

During fieldwork preparation for a book on the wildflowers of Orange County and the Santa Ana Mountains, Mr. Robert Allen encountered an unfamiliar member of the Asteraceae. After examining his photograph and specimens that he had collected, I determined that the plants represent a distinctive subspecies of *Pentachaeta aurea*.

*Pentachaeta aurea* Nuttall subsp. *allenii* Keil, subsp. nov.—Type: U.S.A. CA, Orange Co., Lomas de Santiago, Limestone Canyon Wilderness Park, Limestone Canyon, on gentle south-facing hillside with *Castilleja exserta*, *Linanthus dianthiflorus*, *Erodium* spp., and introduced *Bromus* grasses; the area burned extensively in 1998; 12 Apr 2003, Robert L. Allen s.n. (holotype OBI; isotypes CSUF, RSA, UC).

Laminis flosculorum radiorum bicoloratis duabus tertiis partibus distalibus albis et modo tertia parte proximale aurea a subsp. *aurea* distinguitur.

Annual, 20–35 mm. *Stems* slender, erect, pale reddish brown, glabrous; *branches* ascending, overtopping main stem. *Leaves* alternate, linear, entire, 2–5 cm, 1–1.4 mm wide, distally diminishing to linear bracts, surfaces glabrous, margins inconspicuously villous-ciliolate with fine, septate hairs. *Capitulescence* corymbiform; peduncles elongated, slender, terminating main stem and branches, distally slightly expanded and thinly villous, otherwise glabrous. *Capitula* radiate; receptacles epaleate, slightly convex, glabrous; *involucres* narrowly campanulate, glabrous; *phyl-laries* graduated in 3–4 series, the outer oblong, 3–5 mm, the inner linear  $\pm$  8 mm, each with scarious margins about equal in width to the green, medial zone, the green center exceeding the scarious margins by 0.5–1 mm, tapering to an awn-like tip. *Ray florets* 30–45, fertile; *corollas*

11–14 mm; *tubes* 2.5–3 mm, whitish or reddish tinged, with reddish veins; *laminae* narrowly elliptic, distally narrowed, minutely 3-lobed, bicolored, the proximal third yellow, the distal two thirds white (drying cream), reddening in age; *style branches* 1.5 mm, linear, slightly exerted from corolla tube. *Disk florets* many, fertile; *corollas* tubular, 4.5–6.5 mm, of variable length within a capitulum; *tube* 0.5–1 mm, scarcely differentiated externally from throat; *throat* 2.5–4 mm; lobes  $\pm$  lanceolate, 1.5 mm; tube and lower throat pinkish to light purple, upper throat and lobes yellow; *anthers*  $\pm$  1.5 mm, retained deep within corolla throat, not tailed, with short, awn-like terminal appendages; *style branches* linear, 2–2.5 mm, appendages narrowly cylindric, 1–1.7 mm, hispidulous; stigmatic portion  $\pm$  1 mm, wider than appendages, smooth. *Ray and disk cypselae* similar, clavate, slightly stipitate at base, 1.5 mm,  $\pm$  1.5 mm diameter, terete, with 4–6 narrow lobes, dark brown, puberulent with short, ascending white trichomes; *pappus* of 4–6 stiff bristles, these slightly enlarged at base, 3–4 mm, widely spreading at maturity, minutely barbed, brownish.

DISTRIBUTION, HABITAT, AND PHENOLOGY

*Pentachaeta aurea* occurs in southwestern California and northwestern Baja California (Lane 1993; Van Horn 1973). It is known from the coast to the lower elevations of the Transverse and Peninsular ranges. In California it ranges from southeastern Los Angeles County and southwestern San Bernardino County south through Orange, western Riverside, and western San Diego Counties.

Subspecies *allenii* is known only from southwestern Orange County where its range is nested within that of subsp. *aurea*. It was photographically documented from a coastal site at Dana



Point in 1983 by Fred Roberts (Robert Allen, Research Associate, Rancho Santa Ana Botanic Garden, personal communication), about 20 mi southeast of the type locality. Mr. Allen relocated and photographically documented a very small population at Dana Point in the spring 2003 and 2004, and Fred Roberts took vouchers. However, in early 2006, nearly the entire Dana Point headlands was bulldozed to make way for a housing development, including the spot where the plants had been growing.

The habitat at the type locality is a grassland dominated by introduced Mediterranean grasses with a mixture of native and introduced forbs. The plants were in full bloom in mid-April.

#### BIOLOGY

In features other than their bicolored ray laminae, plants of subsp. *allenii* fall well within the range of variability of *P. aurea*. The white tips of the ray laminae of subsp. *allenii* apparently change color in response to sunlight. Gene Jones and Robert Allen noted that the lamina tips of living specimens of the plant were pale yellow in early morning but turned brilliant white after 1–2 hr in sunshine (Robert Allen, personal communication). The original photo Mr. Allen sent me showed the brilliant white lamina tips, but in herbarium specimens these are cream-colored. Van Horn (1973) noted that rays of *P. aurea* range from pale yellow to burnt orange (rarely white). He indicated that his report of a white-rayed form of *P. aurea* was based upon a specimen collected in 1910 at a train depot near El Toro (*Payne s.n.*, UC). Van Horn noted that rays of the dry specimen appeared very pale yellow and probably were white when collected. El Toro is about halfway between the type locality and Dana Point. Robert Allen (personal communication indicated that the white distal region of the rays of the Dana Point plants is

overall smaller than in the plants from Limestone Canyon. Nesom (2006) treated *Pentachaeta* for the *Flora of North America North of Mexico*. Nesom's description of *P. aurea* made no mention of white or bicolored ray laminae.

#### RARITY

*Pentachaeta aurea* subsp. *allenii* is known only from southern Orange County. The type locality is on land managed by The Nature Conservancy. Protection status of other populations is unknown. The El Toro population is probably no longer extant, and the Dana Point population has probably been extirpated. In view of the development history of Orange County, any plant known from only a few localities should be considered for listing by appropriate private and public agencies.

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