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NEW SUBSPECIFIC COMBINATIONS FOR SOUTHERN
CALIFORNIA PLANTS

Robert F. Thorne

Plant geographers and floristic taxonomists in recent years have become more insistent that monographers define their categories more accurately than they have in the past. Instead of accepting passively the infraspecific rank, usually variety or subspecies, available in the taxonomic literature, authors of floras are deciding from their own, often considerable knowledge of the plants involved what the appropriate infraspecific category should be and making needed combinations. Among such recent authors who have thus chosen to make their own combinations are Munz (1958, 1974), Keck (1958), Calder and Taylor (1965), Hultén (1967, 1968), and Taylor and MacBryde (1978). Understandably they had become impatient with the inability of the botanical taxonomic community to reach general agreement on the definition of taxa. Zoological taxonomists without undue rancor or polemics seem to have rather early achieved general agreement upon the use of subspecies for their geographically significant infraspecific category.

The variety (*varietas*) through most of early botanical taxonomic history has been the infraspecific term generally used to represent all infraspecific ranks from near-species or major race with great geographic and ecologic significance (subspecies) to minor genetic variants, perhaps in many instances controlled by a single gene, that occur haphazardly throughout the range of the species (*forma*). Because the variety thus lacks specificity and because it is so strongly linked in the minds of many plantmen with cultivated varieties (*cultivars*), an increasing majority of plant taxonomists throughout the world prefers to join its zoological brethren in adopting the subspecies as the significant infraspecific category. Most geographers and floristicians (a useful term I have coined as an abbreviation for floristic taxonomists) heartily endorse this promising trend and hope it will become universal among plant monographers. Unfortunately, there are many tradition-bound botanists who cling to *varietas* and abjure subspecies or who pay the subspecific category lip-service but never, or seldom ever, use the rank, which they apparently equate with some super-infraspecific taxon barely below the species and more important than the geographic variety or race. Such a categorical level is occasionally recognizable, and zoological taxonomists call it a super-subspecies, permissible by Article 4 of our International Code (Stafleu, 1972) as a supplementary rank as, for example, superorder. Most of us during our botanical careers do not expect to meet such supersubspecies; hence, prefer to make daily use of the con-

venient and well-defined subspecies for the genetically-based infraspecific category with geographic and ecologic as well as morphologic significance. Hultén (1967) considered the subspecific concept as the best answer "to the actual conditions in nature." After many years of field work throughout the world, I must agree with him.

Those of us working with western American floras are especially fortunate because rather early in the modern taxonomic era California botanists like H. M. Hall, F. E. Clements, E. B. Babcock, G. L. Stebbins, Jr., J. C. Clausen, D. D. Keck, P. A. Munz, L. Abrams, C. B. Wolf, and many other experimental taxonomists, monographers, and field botanists considered the subspecies the significant infraspecific category and used it widely. There are, therefore, already available in the western American botanical literature validly published subspecific combinations for most carefully studied western species possessing recognizable geographic races.

During the preparation of "A Flora of the Santa Ana Mountains, California" (Lathrop and Thorne, 1978), which immediately follows this paper, it was considered desirable to treat all major infraspecific taxa, i.e., morphologically distinct races at least partially isolated geographically or ecologically, as subspecies. Genetic variants without well-defined geographic ranges are treated as varieties and listed in parentheses or brackets to emphasize their lack of phytogeographic importance. Formas are omitted as unworthy of taxonomic mention.

In the preparation of the annotated check-list of vascular plants of the Santa Ana Mountains we found that validly published subspecific names were available for most species with recognizable geographic races. This paper includes the 21 species lacking validly published subspecific names. Several monographers have kindly consented to make necessary combinations in genera they have been studying, Gary Wallace for *Comarostaphylis*, David Dunn for *Lupinus*, and Richard Straw for *Diplacus*. R. Mitchel Beauchamp had planned to make a number of subspecific combinations for his forthcoming "Flora of San Diego County, California." He has generously agreed to make in this paper the necessary combinations for several of the subspecies common to both San Diego County and the Santa Ana Mountains, which barely reach San Diego County and are mostly in Orange and Riverside counties. I have made the remaining combinations and supplied the basonyms and information on phytogeographic areas and morphological differences for all the taxa here considered.

The included subspecies are treated in the order in which they are listed in the immediately following flora, the families arranged alphabetically within classes or subclasses. Though a phylogenist, I feel strongly that floras and herbaria should be arranged for the most part alphabetically for ease and speed of use and reference. Up-to-date phylogenetic systems are

ideal teaching tools and highly suitable for taxonomic text books and other pedagogic works but have little value in local floras.

Cupressaceae

Cupressus guadalupensis Wats. subsp. *forbesii* (Jeps.) Beauchamp, n. comb. (based on *C. Forbesii* Jepson, Madroño 1:75. 1922). The Tecate or Forbes Cypress is a small tree of mountain chaparral found mostly in four large groves in the Sierra Peak area of the northern Santa Ana Mts., the Guatay and Otay Mts. and Mount Tecate of the San Diego County-Baja California border area, and El Cañon de Pinitos of northern Baja California. The subsp. *guadalupensis*, restricted to the north end of Guadalupe Island, is a larger tree with more bluish-green foliage than the mainland subspecies, with slightly glaucous seeds, and with usually a few more scales on the staminate cones. The type of subsp. *forbesii* is from Cedar Canyon near Dulzura in San Diego County.

Boraginaceae

Heliotropium curassavicum L. subsp. *oculatum* (Heller), Thorne, n. comb. (based on *H. oculatum* Heller, Muhlenbergia 1:58. 1904). This subspecies, with type locality along the Russian River in Sonoma County, ranges from coastal northern California to Baja California and inland to the Great Valley and east to the Mojave and Colorado Deserts. It has larger flowers and broader, more spatulate leaves than the more tropical, maritime subsp. *curassavicum*.

Pectocarya linearis (R. & P.) DC. subsp. *ferocula* (I. M. Johnston) Thorne, n. comb. (based on *P. linearis* var. *ferocula* I. M. Johnston, Contr. Arnold Arbor. No. 3:95. 1932). This subspecies, with type locality on Santa Cruz Island, ranges from Monterey County to Baja California and from the islands off the coast to the cismontane slopes of the mainland. It is also known from Argentina and Chile. It apparently does not overlap in range with the subsp. *linearis* of central Chile. It has less heteromorphous nuts with well-dissected margins and shorter, less conspicuous teeth than the subsp. *linearis*.

Ericaceae

Comarostaphylis diversifolia (Parry) Greene subsp. *planifolia* (Jeps.) G. Wallace, n. comb. (based on *C. diversifolia* var. *planifolia* Jepson, Fl. Calif. 3:29. 1939). This subspecies is restricted to Santa Cruz, Santa Rosa, and Santa Catalina Islands and to the coastal Santa Ynez and Santa Monica Mountains, from Santa Barbara County to Los Angeles County. Jepson's type is from Swain Canyon, Santa Catalina Island. The more

austral subsp. *diversifolia* ranges from the lower end of San Juan Canyon, Orange County, in the Santa Anas through the mountains of San Diego County into northern Baja California. Subsp. *planifolia* has more ovate, flatter leaves only slightly revolute at the margins, more ample racemes, broader and larger bracts, and longer pedicels than subsp. *diversifolia*.

Fabaceae

Lupinus albifrons Benth. ex Lindl. subsp. *eminens* (Greene) D. Dunn, n. comb. (based on *L. eminens* Greene, *Erythea* 1:125. 1893). This subspecies, with type locality in the Santa Ynez Mts. of Santa Barbara County, ranges through the interior foothills and canyons from Corvallis, Oregon, to Baja California. It differs from subsp. *albifrons* in flower and fruit characteristics.

Lupinus densiflorus Benth. subsp. *austrocollium* (C. P. Sm.) D. Dunn, n. comb. (based on *L. densiflorus* var. *austrocollium* C. P. Smith, *Bull. Torrey Bot. Club* 45:200. 1918). This subspecies is apparently restricted to chaparral, grasslands, and other dry places, from Orange County to western Riverside and San Diego counties, with type from the city of San Diego. The calyx is more nearly straight and less inflated than in the more northern var. *palustris* (Kell.) C. P. Sm.

Lupinus excubitus Jones subsp. *hallii* (Abrams) D. Dunn, n. comb. (based on *L. Hallii* Abrams, *Bull. Torrey Bot. Club* 37:151, fig. 2. 1910). This lupine is characteristic of grasslands and grassy openings in chaparral and oak woodlands below the pine belt, ranging from Ventura and San Bernardino counties, with type locality in Reche Canyon, to northern Baja California. A larger and coarser plant, its flowers are considerably larger than those of subsp. *excubitus* of the interior and desert ranges of southern California.

Hydrophyllaceae

Phacelia cicutaria Greene subsp. *hispida* (Gray) Beauchamp, n. comb. (based on *P. ramosissima* Dougl. var. *hispida* Gray, *Proc. Am. Acad.* 10:319. 1875). This subspecies, with type from Mount Wilson in the San Gabriel Mts. of Los Angeles County, is common in dry, rocky places in cismontane southern California from San Luis Obispo County to Baja California. The more northern subsp. *cutaria* of the Sierran foothills has more dissected leaves, less dilated calyx lobes, paler corollas, and larger seeds than this subspecies.

Phacelia suaveolens Greene subsp. *keckii* (M. & J.) Thorne, n. comb. (based on *P. Keckii* Munz & Johnston, *Bull. Torrey Bot. Club* 51:298. 1924). This subspecies is one of the few taxa endemic to the Santa Ana Mts., where it is restricted to chaparral between 1220 and 1525 m on or near

Santiago Peak, the highest mountain in the range. Its type locality is "along the trail from Glen Ivy to Santiago Peak" at 1600 m. It has a narrower corolla and smaller, narrower capsule than the more northern subsp. *suaveolens*.

Hypericaceae

Hypericum formosum H. B. K. subsp. *scouleri* (Hook.) Thorne, n. comb. (based on *H. scouleri* Hooker, Fl. Bor. Amer. 1:111. 1830). This western subspecies, with type locality near the Columbia River, ranges from British Columbia to Wyoming, Utah, and southern California. Its sepals are broader, blunter, and less glandular than the subsp. *formosum* of southern Mexico north to New Mexico and Arizona.

Malvaceae

Malacothamnus fasciculatus (Nutt.) Greene subsp. *laxiflorus* (Gray) Thorne, n. comb. (based on *Malvastrum thurberi* Gray var. *laxiflorum* Gray, Proc. Am. Acad. 22:291. 1887). This taxon, with loosely paniculate inflorescence and somewhat bicolored leaves, ranges below 1800 m from Ventura County and Cajon Pass south through the Santa Anas, mostly north of the subsp. *fasciculatus*. The type locality is unknown.

Plantaginaceae

Plantago hirtella H. B. K. subsp. *galeottiana* (Dcne. in A. DC.) Thorne, n. comb. (based on *P. galeottiana* Dcne. in A. DeCandolle, Prod. 13(1):726. 1852). This subspecies, with type from 2500 m, Real de Monte, Mexico, reaches north from central Mexico, mostly along the coast to Washington and inland to Arizona.

Ranunculaceae

Ranunculus cymbalaria Pursh subsp. *saximontanus* (Fern.) Thorne, n. comb. (based on *R. Cymbalaria* Pursh var. *saximontanus* Fernald, Rhodora 16:162. 1914). This more austral subspecies is known from British Columbia and Alberta south to Baja California and Puebla, Mexico. It is more robust and the achenes are less strongly ribbed on the faces and less prominently beaked than the circumboreal subsp. *cymbalaria*. Fernald considered it "a pronounced geographic variety."

Rosaceae

Cercocarpus betuloides Nutt. subsp. *blancheae* (C. K. Schneid.) Thorne, n. comb. (based on *C. betulaeifolius* Nutt. ex Hook. var. *Blancheae* C. K.

Schneid. Mitt. Deuts. Dendr. Ges. 14:127, in part. 1905). This subspecies is largely restricted to the larger California islands, with type from Santa Catalina Island, and to a limited coastal region from the Santa Monica Mts. to Santa Barbara County. It has considerably larger leaf-blades with longer petioles, less pubescent leaves and floral tube, and shorter tails (styles) on the achenes than our more inland subsp. *betuloides*.

Rubus leucodermis Dougl. ex T. & G. subsp. *bernardinus* (Greene) Thorne, n. comb. (based on *Melanobatus bernardinus* Greene, Leaflets Bot. Obs. & Crit. 1:244. 1906). This southern California subspecies of the Western Raspberry ranges from Mt. Pinos through the Transverse Ranges to the Palomar Mts. of San Diego County, usually on cool, shaded, montane slopes and cienegas, springy flats, and stream banks. The type is from Mill Creek Falls in the San Bernardino Mts. The pedicels and hypanthia are glandular-hispid rather than tomentose as in subsp. *leucodermis*.

Saxifragaceae

Ribes californicum H. & A. subsp. *hesperium* (McClat.) Thorne, n. comb. (based on *R. hesperium* McClatchie, Erythraea 2:79. 1894). This gooseberry, with type from the San Gabriel Mts., is found in various plant communities but especially in chaparral in canyons below 650 m in the mountains from Santa Barbara County through the San Gabriels to the Santa Anas. The more northern subsp. *californicum* of Mendocino to Monterey counties has somewhat less pubescent leaves and less strigose sepals.

Scrophulariaceae

Diplacus aurantiacus (Curt.) Jeps. subsp. *australis* (McMinn) R. M. Beeks, n. comb. (based on *D. australis* McMinn, Madroño 11:58-62, fig. 12. 1951). The San Diego *Diplacus*, with type locality at Descanso Grade, San Diego County, is largely restricted to disturbed hillsides and mountain slopes, mostly in chaparral, from the Santa Anas to the Sierra San Borja of Baja California. Its corollas are somewhat less orange than those of the more northern subsp. *aurantiacus*, Orange Bush-Monkey Flower, which reaches Santa Barbara County, and its leaves are only slightly impressed-veiny.

Styracaceae

Styrax officinale L. subsp. *fulvescens* (Eastw.) Beauchamp, n. comb. (based on *S. californica* Torr. var. *fulvescens* Eastw., Bot. Gaz. 41:286. 1906). This subspecies of the California Snowdrop Bush has a highly disjunct range from Mendocino and Butte counties and the central Sierran slopes of

the Great Valley to the Santa Ynez Mts., the type locality, of Santa Barbara County, the eastern San Gabriels, San Bernardinos, Santa Anas, and Palomars to the Mesa Grande of San Diego County. It differs from the more northern subsp. *redivivum* (Torr.) Thorne, n. comb. (based on *Darlingtonia rediviva* Torrey, Proc. Amer. Assoc. Advancem. Sci. 4:190-192. 1851), which ranges from Siskiyou to Alameda and Fresno counties, in its broader, rounder leaves, heart-shaped at the base, much denser stellate tomentum, and prevalence of rufous hairs, especially on the calyx. Both taxa seem to be only subspecifically distinct from the Mediterranean *S. officinale* L. Although recently studied by Gonsoulin (1974), who recognized the two California taxa as only varieties of *S. officinale*, the whole complex needs a thorough biosystematic investigation. Howard (1974) has reminded us that Linnaeus intended the gender of *Styrax* to be neuter.

Cyperaceae

Scirpus cernuus Vahl subsp. *californicus* (Torr.) Thorne, n. comb. (based on *Isolepis pygmaea* Kunth var. *californica* Torrey, Bot. Wilkes Exp. 17:476. 1874). The Pacific coastal subspecies of this subcosmopolitan species ranges from British Columbia to Baja California in moist soils. As pointed out by Beetle (1944), the American plants are "characterized by generally shorter, stouter, often somewhat curved and densely clumped culms" as compared with the European populations.

Liliaceae

Lilium humboldtii Roehl & Leichtl. subsp. *ocellatum* (Kell.) Thorne, n. comb. (based on *L. Bloomerianum* Purdy var. *ocellatum* Kellogg, Proc. Calif. Acad. 5:88, pl. 4. 1873). This southern subspecies of the Humboldt Lily ranges from Santa Barbara County and its Channel Islands, the type locality being on Santa Rosa Island, to the San Jacinto, Santa Ana, and Palomar Mts. It is considerably larger and more scabrous on its parts than the Sierran subsp. *humboldtii*. It has more numerous and broader leaves in the whorls, longer and more divaricate peduncles, and remarkably purplish bulb scales.

Poaceae

Distichlis spicata (L.) Greene subsp. *stricta* (Torr.) Thorne, n. comb. (based on *Uniola stricta* Torrey, Ann. Lyc. N.Y. 1:155. 1824). This inland subspecies is found in alkaline soils away from the coast and is widely distributed from Minnesota and Montana to Texas and Mexico. Its spikelets are somewhat less congested and with somewhat more florets than the subsp. *spicata* of coastal salt marshes.

Summary

The desirability of careful definition of infraspecific categories is stressed, especially for use by plant geographers and floristic taxonomists (floristicians). The increasing botanical use of subspecies throughout the world for the significant infraspecific taxon denoting major geographic or ecologic races is cited and the reasons for its much increased popularity over varieties are listed. For use in the immediately following flora of the Santa Ana Mountains, California, subspecific combinations are published by five taxonomists for 21 species in 16 families.

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