
Rediscovery and Assessment of *Stenogyne sherffii* Degener (Lamiaceae)

Warren L. Wagner

Department of Botany, MRC-166, National Museum of Natural History, Smithsonian Institution,
Washington, D.C. 20560, U.S.A. wagner.warren@nmnh.si.edu

Stephen G. Weller

Department of Ecology and Evolutionary Biology, University of California, Irvine,
California 92717, U.S.A. sgweller@uci.edu

ABSTRACT. *Stenogyne sherffii* O. Degener from the Ko'olau Mountains, O'ahu, Hawaiian Islands, was treated as synonymous with the more common species from the Wai'anae Mountains, *S. kaalae* Wawra, in the most recent revision of the genus by Weller and Sakai in 1990. A single population of about five plants of this entity was rediscovered in 1994. A plant was propagated from a stem cutting in the greenhouse at the University of California, Irvine. Comparison to plants of *S. kaalae* grown in the same greenhouse and herbarium material shows that the rare Ko'olau plants are distinct in several characters, especially subentire vs. serrate leaves. We here recognize this taxon as a subspecies of *S. kaalae* because of the clear species synapomorphy of very dark maroon corolla color and the geographical separation of the two taxa.

Stenogyne Bentham is an endemic Hawaiian genus of vines in the Lamiaceae consisting of 21 species (Weller & Sakai, 1990; Wagner & Weller, 1991), with greater diversity on younger than on older islands. Hawai'i (8 species) and Maui (9 species) have the greatest diversity, while lower diversity occurs on Moloka'i (3 species), Lana'i (2 species), O'ahu (2 species), and Kaua'i (3 species). The reduced lower corolla lip, exserted stamens, abundant nectar production, lack of floral odor, and long falcate corollas of some *Stenogyne* species provide circumstantial evidence for pollination of *Stenogyne* by honeycreepers (Weller & Sakai, 1990). In the Hawaiian genus *Phyllostegia* Bentham, with which *Stenogyne* and *Haplostachys* (A. Gray) Hillebrand share a common ancestor, the presence of a sweet floral fragrance among some species and the expanded lower corolla lip and predominant white coloration indicate pollination by insects (Weller & Sakai, 1990).

After the publication of the treatment of *Stenogyne* by Weller and Sakai (1990), J. Obata rediscovered a small population of the plant described by Degener

(1943) as *S. sherffii* from the northern Ko'olau Mountains, O'ahu. Subsequently, we have propagated it from a stem cutting in the greenhouse at the University of California, Irvine. For comparative purposes we have also grown *S. kaalae* Wawra, which occurs at a number of localities in the Wai'anae Mountains, O'ahu (with a single collection made in 1852 from Nu'uau Pali in the southern Ko'olau Mountains). The plants described as *Stenogyne sherffii* are closely allied to *S. kaalae*, and this taxon was included with *S. kaalae* by Weller and Sakai (1990: 838) based on study of the type. Our greenhouse study shows that the Ko'olau Mountain plants differ in several characters, although the relationship to *S. kaalae* is very close. The morphological distinctions coupled with the geographical separation of about 30 km support recognition of the Ko'olau plants as a subspecies of *S. kaalae*.

Stenogyne species on younger islands of Maui and especially Hawai'i are more polymorphic than the species on the older islands of O'ahu and Kaua'i (Weller & Sakai, 1990). Similar patterns of greater polymorphism within species on the younger islands occur in a number of other genera including *Cyrtandra* J. R. Forster & G. Forster (Gesneriaceae), *Labordia* Gaudichaud (Loganiaceae), *Lysimachia* L. (Primulaceae), *Melicope* J. R. Forster & G. Forster (Rutaceae), *Myrsine* L. (Myrsinaceae), and *Phyllostegia* (Lamiaceae). Extinction of intermediate forms and evolution of novel forms on older islands, as well as increasing isolation resulting from erosion and dissection of habitats, are likely explanations for the greater ease in delimiting species on the older Hawaiian Islands. These factors could explain the patterns of variability seen in *Stenogyne* and other genera, where more narrowly distributed, less polymorphic species are found on the older islands. *Stenogyne sherffii* is an example of a species where geographic isolation has led to

well-defined, through modest, differentiation from *S. kaalae*. In contrast, differences among populations found on the island of Hawai'i may be of greater magnitude, but lack consistency on a geographic basis. Lack of consistency in the distribution of characters prevents recognition of infraspecific taxa within these species and provides the rationale for use of a broadly defined species for many of the *Stenogyne* taxa found on the island of Hawai'i.

Comparison of several closely related taxa of *Stenogyne* illustrates patterns of variation related to island age that require different taxonomic approaches and demonstrate why species-level recognition is given in most of these cases, while subspecies level is used for *S. sherffii*. *Stenogyne macrantha* Benth and *S. scrophularioides* Benth, two polymorphic species from the island of Hawai'i, are very distinct in some areas in both vegetative and floral characters, but show considerable morphological overlap in other areas. Populations that are intermediate may result from areas of secondary contact or represent the extremes of variation in a recently diverged ancestral species. Without extensive study, these hypotheses cannot be differentiated, and at present recognition of two broadly defined species captures the essence of variation in these entities. In contrast, differentiation is geographically and ecologically well marked for a morphologically distinct pair of species from East Maui; the extinct *S. haliakalae* Wawra, which occurred at lower and drier elevations on the south slopes of Haleakala, and *S. rotundifolia* A. Gray, a species still common at higher, wetter elevations on the north slopes of Haleakala. A third pattern of variation is exemplified by *S. purpurea* H. Mann and *S. kealiae* Wawra, both endemic to Kaua'i. These species differ only in vegetative characters, but rare and narrowly distributed *S. kealiae* occurs sympatrically with the widespread *S. purpurea*, and therefore they are considered distinct species. *Stenogyne sherffii* and *S. kaalae*, which like *S. kealiae* and *S. purpurea* on Kaua'i differ only in vegetative characters, are completely allopatric in the same habitat type. The minor, strictly vegetative differences and the allopatric distribution of *S. sherffii* and *S. kaalae* provide the justification for subspecific recognition.

KEY TO THE SUBSPECIES OF *STENOGYNE KAALAE*

- 1a. Leaf margins inconspicuously serrulate, the blades 8–12 cm long, 2–3.5 cm wide, coriaceous; stems glabrous; pedicels 2–5 mm long
..... subsp. *sherffii*
- 1b. Leaf margins serrate, the blades 4.2–7.7 cm long, 1.7–2.9 cm wide, thin and membranous;

stems usually pubescent; pedicels 4–7 mm long
..... subsp. *kaalae*

Stenogyne kaalae* Wawra subsp. *sherffii (O. Degener) W. L. Wagner & Weller, comb. et stat. nov. *Stenogyne sherffii* O. Degener, Brittonia 5: 58. 1943. TYPE: Hawaiian Islands [U.S.A.], O'ahu: [Ko'olau Mountains], Kawaiiloa, Pe'ahinai'a trail, 28 Apr. 1940, O. Degener & Ordoñez 12999 (holotype, NY; isotype, NY).

Scandent vines, climbing or sprawling and rooting at the nodes; stems 2.5–6 m (in cultivation), quadrangular, glabrous. Leaves glossy, coriaceous, lanceolate, the blades 8–12 cm long, 2–3.5 wide, antrorsely strigulose along the adaxial midvein, otherwise glabrous, margins inconspicuously serrulate, apex acute to weakly acuminate, base cuneate, petioles 1–2 cm long. Flowers (3)5 per verticillaster, sometimes some of them on a peduncle up to 2–5 mm long, pedicel 2–5 mm long, retrorsely strigulose; calyx nearly radially symmetrical, narrowly campanulate, 9–15 mm long at anthesis, green or tinged purple, glabrous, the teeth linear-lanceolate, 5–8 mm long; corolla very dark maroon, hispidulous externally, the hairs weakly antrorse, the margins and inner surfaces glandular puberulent, the tube mostly straight, curved slightly at the throat, 11–12 mm long, upper lip 9–10 mm long, lower lip 2–3 mm long. Nutlets 4 mm long, fleshy, dark purple.

Distribution. Known only from the Pe'ahinai'a Trail in the northern part of the Ko'olau Mountains, O'ahu, from only two collections (1940 and 1994). Apparently there is only a single extant population with perhaps five individuals (J. Obata, pers. comm.).

Specimen examined. HAWAIIAN ISLANDS [U.S.A.], O'ahu: Ko'olau Mountains, Pe'ahinai'a Trail, 1994, Obata s.n. (US), cultivated in 1997 from Obata s.n. (BISH, F. K, US).

Acknowledgments. We appreciate the helpful comments by R. Shannon and two anonymous reviewers on the manuscript, and John Obata for providing us with cuttings to propagate in the greenhouse.

Literature Cited

Degener, O. 1943. *Stenogyne sherffii*, a new mint from Hawaii. Brittonia 5: 58–59.

Wagner, W. L. & S. G. Weller. 1991. Resurrection of a Kaua'i *Stenogyne*: *S. kealiae*. Pacific Sci. 45: 50–54.

Weller, S. G. & A. K. Sakai. 1990. *Stenogyne*. Pp. 831–843 in W. L. Wagner, D. R. Herbst & S. H. Sohmer, Manual of the Flowering Plants of Hawai'i. Univ. Hawaii Press and Bishop Museum Press, Honolulu.