

The Nomenclatural and Taxonomic Status of the Hawaiian Shrub *Scaevola gaudichaudii* H. & A.¹

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IN HIS TREATMENT of the genus *Scaevola* in Hawaii, Skottsberg (1927) assigned the name *Scaevola menziesiana* Chamisso to a species that occurs on the six major Hawaiian islands, but which he apparently had not seen in nature. He cited many specimens from earlier collectors but none of his own. In reference to flower color he commented: "The corolla is said to be yellow. Fresh material of this interesting form is very desirable."

Let it suffice here to say that the first name applied to this species was *Scaevola montana* Gaudichaud, a name that had already been applied to a *Scaevola* from New Caledonia by Labillardière. Noting this earlier application of Gaudichaud's name, Hooker and Arnott assigned the name *Scaevola gaudichaudii* to Lay and Collie's collection of this taxon, and this is the correct name for the species we are dealing with.

In my recent cytological study of *Scaevola* in Hawaii, I have found that all species are characterized by the chromosome number $n = 8$. The related genus *Camphusia*, remarkable for its non-bracteate flowers suggestive of *Clermontia*, is unique in being tetraploid ($n = 16$), in having most distinctive pollen (Selling, 1947), and in other features that need not be elaborated here. The genus *Scaevola*, in the framework of this paper, is considered distinct from the latter.

In the present view of the genus *Scaevola* in Hawaii, *S. gaudichaudii* is a most interesting species on several counts. It is the only species in which the corollas are distinctly yellow. Among the other species, *S. mollis* is characterized by violet flowers, and the flowers of all others are white, or white with some degree of violet pigmentation. In addition, *S. gaudichaudii* is much

more closely adapted to dry-land habitats than is any other species, and it is the only one in which the inflorescence consists of a single flower (Fig. 1). These features clearly delineate this species, and its ecological and morphological attributes merit a more clearly expressed account than has been available heretofore.

In my work on the genus *Scaevola* in the Hawaiian Islands, all species have been studied in the field. These include the rare, nearly extinct *S. coriacea* Nutt., and the rare but locally abundant *S. kilaueae* Degener. While Degener (1933) stated that the flowers of *S. kilaueae* are yellow, this applies only to pressed specimens. The extensive population of this species just south of Kilauea Volcano on the island of Hawaii is characterized by white flowers that turn yellow upon desiccation. It is true that the yellow-flowered *S. gaudichaudii* has been collected only a few miles west of the above locality, and it is possible that there is some intergradation between these two species. However, no such intergradation is known or claimed here, although it is conceded that the two species have similarities. However, there is an even closer similarity between *S. gaudichaudii* and *S. gaudichaudiana* on the islands of Oahu and Kauai, where there is strong indication of intergradation between the two species. It is unfortunate that two similar species should carry such correspondingly similar names as to cause confusion in field and laboratory references, but such are the problems encountered in application of the International Code of Botanical Nomenclature.

My first impression upon encountering an extensive population of *Scaevola gaudichaudii* above Lahainaluna, West Maui, was that here was a very distinct species. A perusal of Hillebrand (1888) shows that this species, quite possibly the same population, had been examined and collected by early botanists. This population includes well over 100 plants at various stages of maturity, including many of consider-

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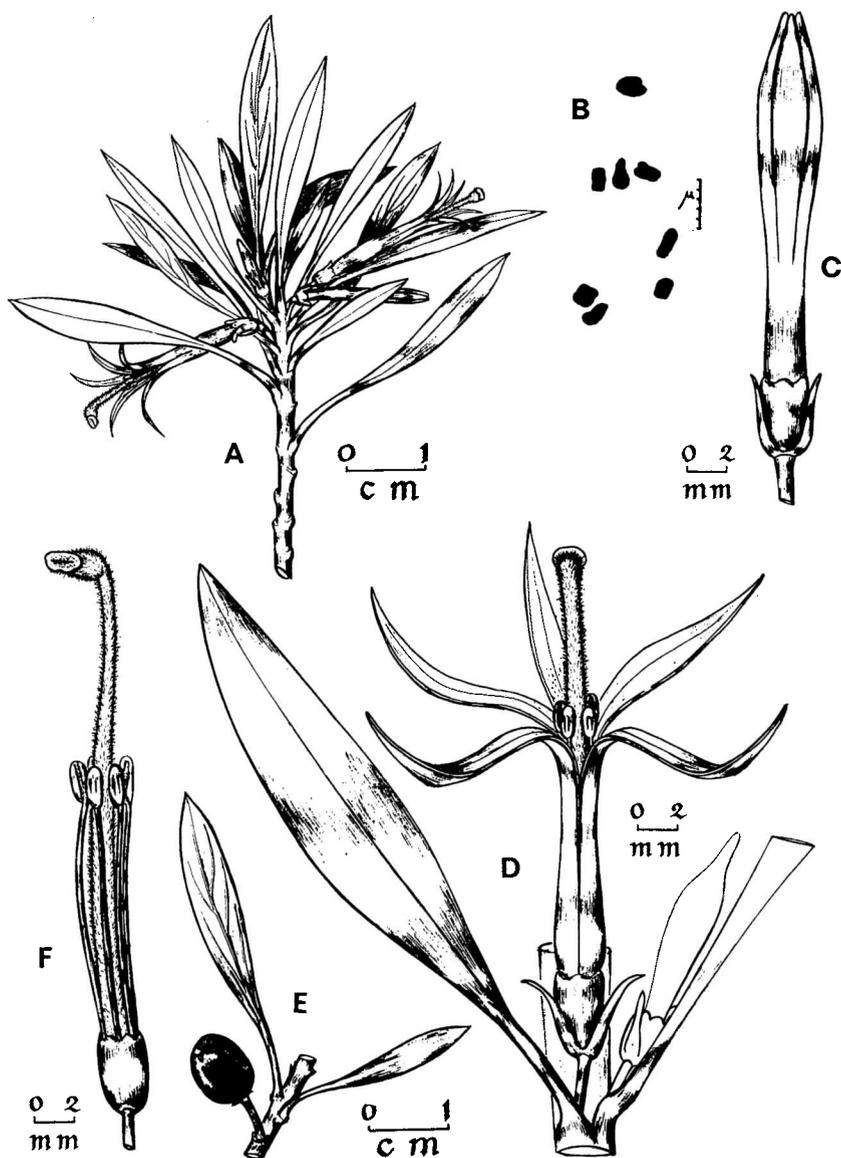


FIG. 1. *Scaevola gaudichaudii* H. & A., drawn from Gillett 2006. A, Flowering branch; B, chromosome complement ($n = 8$) at first metaphase of meiosis; C, flower just prior to anthesis; D, axillary inflorescences and flower at anthesis; E, mature fruit; and F, flower after separation of the corolla, showing receptive tissue of the stigma.

able size. The uniformity of the population is expressed in flower color (apricot yellow: Ridgway, 1912), inflorescence, leaf form, habit, and fruits. There can be no doubt that this is a distinct species and that it is not a minor variant of the related *S. gaudichaudiana*. This population is growing at elevations between 250

and 500 meters, on a unique geological formation that is marked by a gray coloration of the parent rock. The area has a relatively low rainfall and the habitat is distinctly dry-land forest in character, the associated genera including the rare indigenous genus *Gouania*. Among the upland Hawaiian *Scaevolae*, this species has the

strongest adaptation to endangered and decimated dry-land habitats. It has been collected on such habitats on all of the six major islands. However, the only recent collections are from Lahainaluna, and it is certain that the other populations have been severely decimated.

Scaevola gaudichaudii H. & A. Bot. Capt. Beechey's Voy., p. 89, 1832.

Scaevola montana Gaudichaud. Voyage autour du monde, fait par Ordre du Roi l' Uranie et la Physicienne, pp. 460-461, 1829. Not *Scaevola montana* Labillardière, 1825.

Scaevola menziesiana Chamisso. Linnaea 8:277, 1833.

Scaevola swezeyana Rock. Bull. Torrey Bot. Club 36, 1909.

Temminckia gaudichaudii De Vriese. Ned. Kruidk. Archief 2:144, 1854.

Glabrous ovoid to globose shrub 0.5-2 m high, the form expressed by divaricate, ascending branches; leaves with petioles 0.5-1.5 cm long, the glabrous blades coriaceous, lanceolate to oblanceolate, up to 4.5 cm long and 1.2 cm broad, equilateral and cuneate-attenuate at base, rounded to obtuse to acute at apex, entire to serrate at margins with 1 or 2 teeth per cm, the primary veins 1-3 per side, curved upward at margins; inflorescence borne in the leaf axil, consisting of a single flower on a pedicel 0.5 cm long, the pedicel terminated by a pair of equal, linear bracts 3-4 mm long; ovary ca. 3 mm long, surmounted by 5 rounded, glabrous calyx lobes scarcely 0.5 mm high; corolla 2-2.5 cm long, the linear lobes glabrous on outer surface, pubescent on inner surface with hairs ca. 0.5 mm long, the lobes apricot yellow with brown mid-vein and marginal veins; stamens 7 mm long, the anthers basifixed, 2 mm long, the glabrous filaments 5 mm long, erect at anthesis; style 2-2.5 cm long, equal to the corolla, densely pubescent with hairs 0.5 mm long, the stigma at early anthesis covered with a ciliate indusium that retains pollen, the stigma growing after anthesis, producing receptive tissue that presumably would permit outcrossing; the corolla, stamens, and style separating from the summit of the ovary after anthesis; fruit a glabrous, dark purple, ovoid drupe, when dry 5 mm long and 4 mm broad, the 2-celled stone

sinking in fresh water and sea water. Chromosome number is $n = 8$.

TYPE: Collected in the Hawaiian Islands by Lay and Collie of Captain Beechey's Voyage. Type not seen.

DISTRIBUTION: Upland dry ridges between 250 and 800 meters with annual rainfall of approximately 40 cm. On relatively open habitats, with *Dodonaea*, *Osmanthus*, *Gouania*, *Styphelia*, *Bidens*, *Canthium*, *Wikstroemia*, and other dry-land indigenous and exotic species. This species occurs on the islands of Kauai, Oahu, Molokai, Lanai, Maui, and Hawaii.

SPECIMENS EXAMINED:³ KAUAI: Milolii Ridge, Waimea, *St. John and Fosberg 13726, 13730, 13737*; Makaha Ridge, 1500 feet, *Judd 79*; flats back of Mana, *Rock 16039*. OAHU: Kulepiamo Ridge, Niu, 1,000 feet, *St. John 20,109*; Kawaihoa Ridge, *Degener 19,510*; Wai-lupe, ± 400 m *Russ s. n.*; Kaimuki Ridge, *Forbes 1857-0*; middle ridge, Niu Valley, *Degener 7763*; Palolo Valley, *Rock 14135*; Palama Trail, ± 300 m, *Judd 62*; Kaaawa Valley, 325 m, *Judd 60*; Kuaokala Forest Res., Waianae Mts., ± 1500 feet, *Hosaka 1293*. MOLOKAI: Pukoo ridges, *Forbes 349-MO*; Kahuaawi Gulch, *Degener 17247*. LANAI: Mahana, *Rock 8129*; Kanepuu Point, *Munro s. n.*; Kaiholena, *Munro 47*. WEST MAUI: Lahainaluna, *Forbes 310-M*; ridge above Lahainaluna, 400-800 m, *Gillett 2006*. EAST MAUI: Kealii, south slope of Haleakala, *Forbes 212-M*. HAWAII: Kahuku, Kau District, on aa lava land, ± 1500 feet, *L. W. Bryan s. n.*

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³ All specimens are in the herbarium of the B. P. Bishop Museum, Honolulu. The kindness of Dr. Pieter van Royen, Head of the Department of Botany, in making these specimens available for study is gratefully acknowledged.

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