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Some New or Otherwise Noteworthy Dicotyledonous
Plants from the Hawaiian Islands

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During the past year I have received for examination and study a large number of miscellaneous specimens of dicotyledonous plants. Most of them were collected in the Hawaiian Islands by Dr. Carl Skottsberg (formerly Director of the Botanical Garden at Gothenburg, Sweden) and his associate in the field, Dr. Folke Fagerlind, or by Mr. Otto Degener and Miss Amy Greenwell and their several associates. Dr. Skottsberg generously permits me to publish herewith my findings regarding the plants collected by him and Dr. Fagerlind. In the case of all plants collected by Mr. Degener and his associates, I have had the benefit of Mr. Degener's notes and friendly counsel and have been permitted by him to publish under joint authorship with him such entities as have proved new.

As was done for all genera studied by me in the past, large, detailed photographs of practically all the more important *exsiccatae* studied have been made. I now have a complete set of photographs taken from 1913 to date and totalling over 4,000. A duplicate set is in the Chicago Natural History Museum. References will be found in the following pages to some of these photographs.

The plants treated in this paper belong to the following families and genera: Pittosporaceae (*Pittosporum* Banks), Sapindaceae (*Dodonaea* L.), Euphorbiaceae (*Aleurites* Forst., *Euphorbia* L.), Apocynaceae (*Rauwolfia* [Plum.] L.), Labiatae (*Phyllostegia* Benth., *Stenogyne* Benth.), and Compositae (*Dubautia* Gaud., *Raillardia* Gaud., *Lipochaeta* DC., *Bidens* L.).

The following abbreviations are used for the depositories cited in this paper: Arn., Arnold Arboretum, Jamaica Plain, Massachusetts; Berl., Berlin Botanical Garden; BM, Bernice P. Bishop Museum, Honolulu; Chi., Chicago Natural History Museum (formerly Field Museum of Natural History), Chicago; Del., Delessert Herbarium, Geneva; Goth., Botanical Garden of Gothenburg; Kew, Royal Botanical Gardens, Kew; NY, New York Botanical Garden; Phila., Academy of Natural Sciences, Philadelphia; UCLA, University of California at Los Angeles.

Pittosporum

Pittosporum Hosmeri var. **Saint-Johnii** Sherff, Field Mus., Bot. Ser. 22: 413, 1941.

This rare variety has been known heretofore from a single suite of three specimens (*Saint John et al. 11,442*) from a shrub 6 ft. tall found at 4,000 ft. alt., Mt. Hualalai in the Kailua quadrangle of western Hawaii. Amy Greenwell recently obtained specimens of it from a tree 10 ft. tall, at 5,000 ft. alt., Kealakekua Ranch, Papaloa, in the same (Kailua) quadrangle, Mar. 20, 1949 (*Otto Degener distrib. no. 19,560*, Chi., NY). She noted that the young leaves were eaten by cattle.

Pittosporum amplectens Sherff, Field Mus., Bot. Ser. 22: 407, 1941.

Formerly *P. amplectens* has been known only from its type habitat in northwesternmost Hawaii. However, Greenwell recently collected a specimen of apparently the same species growing much farther south on Hawaii (*Otto Degener distrib. no. 19,209*), flowers creamy white, growing in fern country, wet open forest, alt. 3,000 m., Kahuamanoa paddock, Arthur Greenwell Ranch, Kealakekua, Feb. 10, 1948 (Chi.).

Pittosporum confertiflorum var. **microphyllum** Sherff, Am. Jour. Bot. 28: 25, 1941.

Heretofore, this variety from the island of Lanai has been known only from its type (BM) and three isotypes (Berl., Chi., Gray). A folder of additional, flowering and fruiting material recently collected by Fagerlind and Skottsberg (no. 6,402, near Munro house, south slope of main ridge, Lanai, Feb. 24, 1948; Goth.; my photograph no. 3,960) is now before me. It excels in having an abun-

presence of well-developed flowers, totalling 12-15 in each of the ample inflorescences present. The sepals are oblong-lanceolate to narrowly ovate and measure about 5-5.5 mm. long. The corolla-tubes are 12-13 mm. long and mostly 3-4.5 mm. thick. The spreading, mostly oblong to subrotund-ovate petal-limbs are about 5 mm. long.

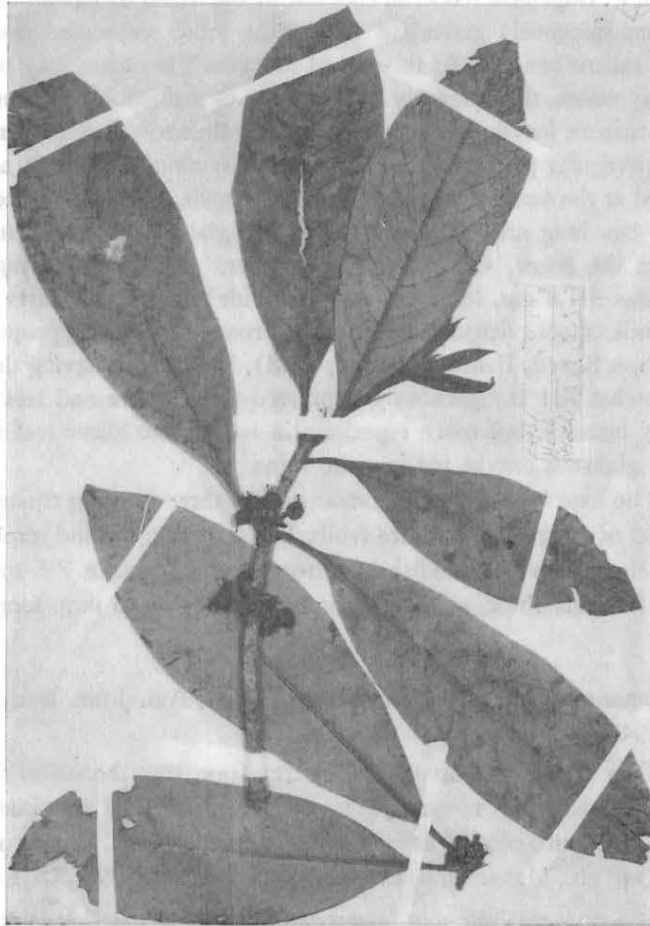


FIGURE 1.—*Pittosporum Gayanum* var. *Skottsbergii* (type).

Pittosporum Gayanum* var. *Skottsbergii, new variety (fig. 1).

Foliorum venae moderate supra depressae infra prominentes, tomento utrinque extemplo caduco vel inferne ad venas ipsas irregulariter persistente.

Leaf-veins moderately depressed above and moderately salient beneath, the tomentum on both surfaces soon disappearing or on lower surface persisting irregularly along the veins themselves.

Specimens examined: *Fagerlind and Skottsberg 6,532*, Power Line Trail above second house, Hanalei Valley, northernmost Kauai, Mar. 9, 1948 (Goth., type; my photograph no. 3,961).

In *P. Gayanum* Rock, an endemic of the island of Kauai, the leaves are conspicuously reticulate with veins much depressed above and very salient beneath. At the tips of last year's branches may be found young shoots, these densely dark-brown- or reddish-brown-tomentose. The mature leaves are glabrous or glabrate above but so beneath in only irregular patches. In *P. Gayanum* var. *waialealae* Rock, a variety found at the summit of Mt. Waialeale, Kauai, the leaves (blades only 5-10 cm. long and 2-3.5 cm. wide) are glabrous even when young. From the latter, var. *Skottsbergii* differs at once in having leaves (blades ± 1.8 dm. long and ± 6 cm. wide), indeed all parts of each juvenile shoot, densely tomentose. From the species proper (var. *typicum* Sherff, *Brittonia* 6: 333, 1948), it differs in having the leaves somewhat less conspicuously depressed-veiny above and less salient-veiny beneath, but more especially in having the lower leaf-surfaces soon glabrous except for just the veins.

The lone type specimen examined has three fruiting clusters, with a total of 19 small, immature fruits. These are rugose and scrobiculate, densely brown- or reddish-brown-tomentose, capsule 7-8 mm. long and 5-7 mm. thick, style and stigma totalling 2.5-3 mm. long.

Dodonaea

Dodonaea eriocarpa var. *lanaiensis* Sherff, *Am. Jour. Bot.* 32: 207, 1945.

This variety has been known heretofore from the island of Lanai only. Degener has recently collected a large suite of staminate specimens in south-central east Maui: *Degener 19,352*, among rocks at 1,000 ft. alt., Mahamenui, Dec. 25, 1948 (BM, Chi., NY, UCLA, etc.).

Dodonaea eriocarpa var. *pallida* f. *pallida* Degener and Sherff in Sherff, *Am. Jour. Bot.* 32: 210, 1945.

Heretofore, a single (type) collection of this form has been known, namely, *Degener 11,166 pro parte*, on arid, rocky slope, east part of Kaluaaha plateau, southeastern Molokai, July 3, 1928. Recently,

Degener and Clay collected a suite of staminate specimens in north-westernmost west Maui, just across the Pailolo Channel from the Molokai habitat: *Degener and Clay 19,350*, grassy ledges, Honokohau Valley, Dec. 19, 1948 (BM, Chi., NY, UCLA, etc.). While here, as in the above-mentioned var. *lanaiensis*, the specimens are staminate and hence without fruits, they have otherwise been found to match very closely materials of the type collection. The specimen of *Degener and Clay 19,350* allocated to the Chicago Natural History Museum was accompanied by a packet containing a lone 3-winged fruit, but whether this came from the same plant as did the other specimens I do not know.

Dodonaea eriocarpa* var. *Degeneri Sherff, Am. Jour. Bot. 32:208, 1945.

At the time that this variety was published, several suites of specimens were cited for its typical form, f. *Degeneri* Sherff (*loc. cit.*). These had all been collected in southern west Maui. Additional plants of var. *Degeneri* were cited for southwestern east Maui, but these had all been determined as a different form, f. *decipiens* Sherff. Recently, Degener and Clay collected in northwestern east Maui a large suite of specimens that, while entirely staminate and so lacking in fruits, is not separable from f. *Degeneri*: *Degener and Clay 19,348*, on ledges among pineapple fields, Kaliaiului Gulch, Makawao, east Maui, Dec. 31, 1948 (Arn., BM, Chi., Del., NY, Phila., UCLA, etc.).

Dodonaea eriocarpa* var. *typica* f. *typica, new form.

Dodonaea eriocarpa var. *typica* Sherff, Am. Jour. Bot. 32:204, 1945 (*sensu stricto*).

Dodonaea eriocarpa* var. *typica* f. *bifurculata, new form.

Styli ramuli tantum 2 non 4.
Stylar branches only 2 instead of 4.

Specimens examined: *Fagerlind and Skottsberg 6,610*, collected in open country along road to Makaha Point, Kauai, Mar. 14, 1948 (type, Goth.; my photograph no. 3,962).

Specimens of the forma *typica* are known (see Sherff, Am. Jour. Bot. 32:204, 1945) only from the islands of Hawaii and Molokai. Typically their style ends in four stigmatic branches. On Kauai, which stands at the extreme northwest of the Hawaiian

Archipelago (Hawaii standing at the opposite end and Molokai in the center), a form (f. *bifurculata*) occurs with only two stigmatic branches. Otherwise it seems inseparable from f. *typica*.



FIGURE 2.—*Dodonaea eriocarpa* var. *Skottsbergii* (type).

Dodonaea eriocarpa var. *Skottsbergii*, new variety (fig. 2).

Arbor ± 6 m. alta, ramulis ultimis hispidulis, foliis membranaceis plus minusve subnitidis oblongo-lanceolatis utrinque acuminatis lamina plerumque 8-11 cm. longa et 2-3.2 cm. lata supra fusco-viridi et secundum nervum medianum hispidula, infra vix pallidiori ad nervum medianum (non stramineum) aegre hispidula, marginibus plus minusve ciliata. Inflorescentia (tantum masculina visa) hispidula, sepalis lineari-oblongis vel ovatis 3-3.5 mm. longis.

Tree ± 6 m. tall, ultimate branchlets hispidulous; leaves membranaceous, somewhat glossy, oblong-lanceolate, at both ends acuminate, blade commonly 8-11 cm. long and 2-3.2 cm. wide, on upper surface brownish green and along median nerve hispidulous, on lower surface scarcely paler but along median nerve (this not stramineous) weakly hispidulous, at margins more or less ciliate. Inflorescence (only the staminate seen) hispidulous, sepals linear-oblong or ovate, 3-3.5 mm. long.

Specimens examined: *Fagerlind and Skottsberg 6,233*, a tree about 20 ft. tall, at about 2,000 m. alt., along truck road from Kilauea to Mauna Loa, Hawaii, Feb. 5, 1948 (type, Goth.; my photograph no. 3,963).

This variety suggests in size, shape, and color of its leaves some specimens of *D. sandwicensis*, but differs in its hispidulous, not glabrate inflorescence, its hispidulous median leaf-nerves, its larger sepals (these 3-3.5 not 1-2 mm. long), and so forth. Similarly, it may suggest *D. eriocarpa* var. *glabrescens*, but that variety has the leaves quite glabrous, their median nerves stramineous beneath, the inflorescence glabrescent, the sepals only 2-2.25 mm. long, and so forth. In the key to various elements of *D. eriocarpa* previously presented by me (Am. Jour. Bot. 32: 205, 1945), var. *Skottsbergii* would go under the first "a." From the one Hawaiian variety listed in the key, var. *Hosakana*, it can be distinguished instantly by its fewer, larger, more scattered flowers, with sepals 3-3.5 (not under 1.5) mm. long.

In naming this variety, as also in naming the new variety of *Pittosporum Gayanum* described above, it is a pleasure to commemorate the name of Dr. Carl Skottsberg, to whose indefatigable zeal and discriminating studies Hawaiian botany owes a great debt.

Aleurites

Aleurites Remyi Sherff, Field Mus., Bot. Ser. 17: 558, 1939; Am. Jour. Bot. 31: 157, pls. 1-3, 1944.

This species, as formerly stated, was definitely known only from a tree at Hilo, northeastern Hawaii, where it had been grown from a fruit brought from North Kona, Hawaii, and from North Kona itself, in western Hawaii, where it was understood to have been grown from a fruit brought from the island of Kauai. Recently, Greenwell found several young trees of this same species growing at Puu Anahulu, 16 or more miles northeast of the previously known habitat (along road between Holualoa and Kailua) in North Kona. Her specimens, collected March 14, 1949, and distributed under

Degener's distribution number 19,556, are accompanied (at Chi.) with two exceptionally sharp *kodachrome* transparencies showing selected fruiting trees photographed by Greenwell, Mar. 24, 1949.

Euphorbia

Euphorbia dentata Michx., Fl. Bor.-Am. 2: 211, 1803.

In my revision of the Hawaiian species of *Euphorbia* (Missouri Bot. Gard., Ann. 25: 1-94, pls. 1-11, 1937), this species was not included. Nor does it seem to be mentioned in the more recent literature pertaining to the flora of the Hawaiian Islands (for example, Ripperton and Hosaka, Vegetation zones of Hawaii, Haw. Agric. Exp. Sta., Bull. 89: 53, 1942). Recently, Degener has found numerous small flowering specimens of it growing as a pasture weed in Kahikinui, southern east Maui. His plants, collected Dec. 25, 1948, are numbered 19,303a (BM, Chi., NY, UCLA, etc.). They had been growing along with similarly small flowering specimens of *Euphorbia geniculata* Ort., later numbered 19,303b (BM, Chi., NY, UCLA, etc.).

Euphorbia olowaluana* var. *gracilis* f. *polycephala, new form (fig. 3).

Capitula numerosa, plerumque in ramulis lateralibus curtatis 3-5-adgregata. Cyathia numerous, commonly in clusters of 3-5 on abbreviated lateral branchlets.

Specimens examined: *Fagerlind* (*Fagerlind and Skottsberg distrib. no.*) 6,125, alt. about 2,000 m., slope of Mauna Kea above Pohakuloa, Hawaii, Jan. 29, 1948 (type, Goth.; my photograph no. 3,968); *C. N. Forbes 874-H*, Omaokoili, same vicinity, June 17, 1915 (Chi.); *J. F. Rock*, Puuwaawaa, island of Hawaii, August 1917 (BM).

In my revision of the Hawaiian species of *Euphorbia* (Missouri Bot. Gard., Ann. 25, 1937) mention was made of the Forbes and the Rock plants "and their numerous capitula," but, in the absence of seeds in the capsules found on the Forbes plant, hybridity was feared and the bestowal of a new epithet such as *polycephala* was deferred. Recently, after a lapse of more than three decades since Forbes and Rock made their collections, Fagerlind made another collection in the same part of Hawaii and obtained the same form, but in superior condition. The principal leaves are as large as in var. *gracilis* proper, which may here be designated f. ***gracilis***, new form; syn. *E. olowaluana* var. *gracilis* (Rock) Sherff, Bot. Gaz. 97: 581, 1936 (*sensu stricto*).

Moreover, a few capsules are mature and have ripe seeds, these varying as in the species proper (var. *typica* Sherff, *Brittonia* 6: 335, 1948) from grayish to brown.



FIGURE 3.—*Euphorbia olovaluana* var. *gracilis* f. *polycephala* (type).

Euphorbia kuwaleana Degener and Sherff, new species (fig. 4).

Frutex erectus usque ad 9 dm. altus, multum ramosus, cortice primum rubido-brunneo demum atro-griseo, nodis nunc numerosissimis et internodiis tantum 2-5 mm. longis nunc paucioribus internodiis 1-2 cm. longis, ramulis ultimis saepius tenuibus itaque penultimo crassiusculo dissimilibus, glabris vel interdum irregulariter patenti-hispidulis. Folia opposita, disticha, sessilia vel parce subsessilia, oblongo-ovata vel nunc late (etiam subrotunde) nunc moderate oblonga,

infra pallidiora, apice rotundata et saepe aegre emarginata, basi obliqua et plus minusve cordata, margine integra, utrinque glabra vel basi ipsa tomentulosa, principalia usque ad 2 cm. longa et 1.5 cm. lata; corpore interpitiolari (stipulato) hispidulo sub 1 mm. alto. Capitula (paucis visa) sessilia, solitarium saepe ramulum minimum terminans, involucre campanulato circ. 1.7 mm. alto inferne glabrato superne albo-tomentuloso; glandulis brunneis rotundatis reniformibusve, plus minusve patentibus, magnitudine diversis, saepius 2-4; staminibus exsertis. Capsula immatura (subglabrescens et sub 1 mm. longa), stipite patenti-hispidulo circ. 1.2 mm. longo; stylis distinctis, albo-hispidis, supra medium bifurcatis nigrisque. Semina non visa.

Erect shrub, up to 9 dm. tall, much branched, bark at first reddish brown finally dark gray, nodes now very numerous and internodes only 2-5 mm. long now fewer and internodes 1-2 cm. long; ultimate branchlets more often slender and thus unlike the rather thickish penultimate ones, glabrous or at times irregularly spreading-hispidulous. Leaves opposite, distichous, sessile or barely subsessile, oblong-ovate or now widely (even almost roundedly) now moderately oblong, paler beneath, at apex rounded and often weakly retuse, at base oblique and more or less cordate, at margin entire, on both surfaces glabrous or at the base itself tomentulose, principal leaves up to 2 cm. long and 1.5 cm. wide; interpitiolar or stipular body hispidulous and under 1 mm. tall. Heads or cyathia (only a few seen) sessile, often a solitary one terminating a diminutive branchlet; involucre campanulate, about 1.7 mm. tall, glabrate below but white-tomentulose above; glands brown, rotund or reniform, more or less spreading, diverse in size, more often 2-4; stamens exserted. Capsule immature (subglabrescent and under 1 mm. long), its stipe spreading-hispidulous and about 1.2 mm. long; styles distinct, white-hispid, bifurcate and black above their middle. Seeds not seen.

Specimens examined: *Otto Degener and Toshio Murashige 19,613*, up to 3 ft. tall, on arid volcanic cliffs at 800 ft. alt., Mauna Kuwale, Waianae, Oahu, June 12, 1949 (type, Chi., my photograph no. 3,951: isotypes, BM, Del., Kew, NY, UCLA, etc.).

In my above-cited revision of the Hawaiian species of *Euphorbia*, this species would run in the key there given to the last letter "o" on page 8. From the various entities there listed, it may be distinguished as follows: *E. multiformis* var. *tomentella* (of Oahu) has the branchlets strongly tomentulose to tomentose, leaves petiolate (petiole 2-3 mm. long), and so forth. *E. multiformis* var. *haleakalana* (of east Maui) has leaf-blades commonly cuneate-obovate. *E. Skottsbergii* (of southern Oahu) is prostrate and has slender leaf-petioles 1-3 mm. long. Its variety *kalaaloana* (of southern Oahu) and variety *audens* (of northwestern Molokai) have definitely petioled leaves, and these are often denticulate in the latter. *E. multiformis* var. *sparsiflora* (of southern Kauai) has leaves oblong-oblong-ovate, also slenderly petioled. *E. festiva* (of Oahu), a species for which, as I have shown elsewhere (*Am. Jour. Bot.* 31: 158, 1944),

the earlier name *E. Deppeana* Boiss. must be used, has most of its leaves obsolete 1-8-denticulate on each margin, the blades on a slender but short and glabrate petiole, the styles connate at base, and so forth. *E. multiformis* var. *microphylla* (of Oahu and north-eastern Molokai) has leaves mostly cuneate below and definitely slender-petioled. Mr. Degener very kindly joins me in the authorship of this species, but personally inclines to the opinion that the species and its closer congeners are better segregated under the name *Chamaesyce*.

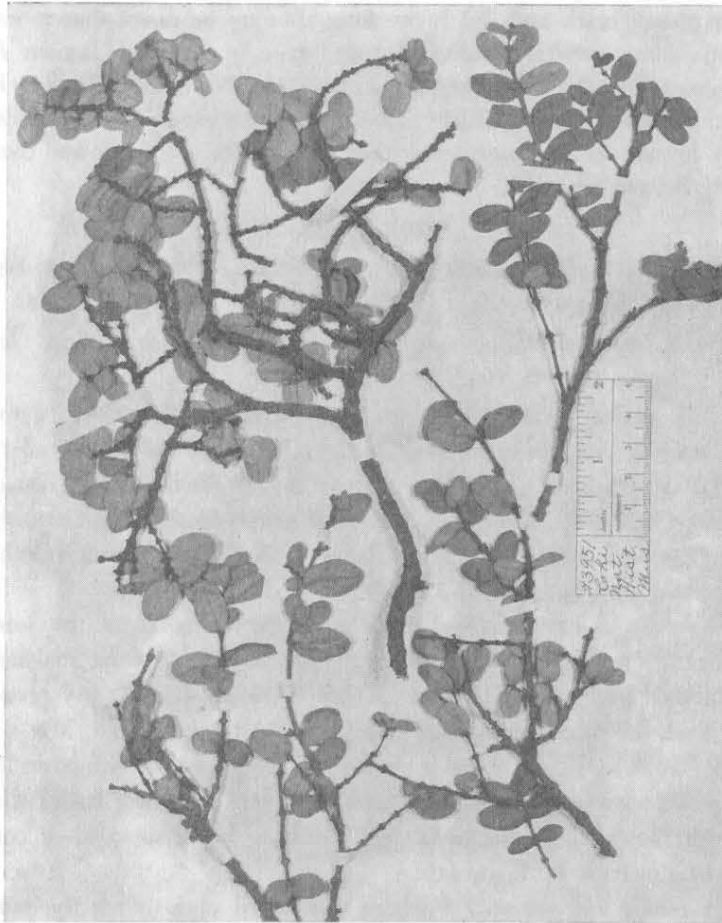


FIGURE 4.—*Euphorbia kuwaleana* (type).

Rauwolfia

Rauwolfia molokaiensis Sherff, Field Mus., Bot. Ser. 23: 319-336, pl. 1, 1947.

In my recent report on a preliminary study of the Hawaiian species of *Rauwolfia* (*op. cit.*, p. 326), I described this species for the islands of Molokai (vars. *typica* and *parvifolia*) and Lanai (var. *typica* only). Recently (Dec. 23, 1948), Degener collected a large suite of specimens of var. *typica* from a densely twiggy tree 10 feet tall, growing in aa lava, seaward of Kahikinui, in the southern part of east Maui. Many flowers and a few mature fruits were present, the latter glossy black and ± 1.5 cm. long. It may be noted that it was in this same general locality that the type of the little-known *R. mauiensis* Sherff (Field Mus., Bot. Ser. 23: 330) was collected. In *R. mauiensis* the principal leaves are mostly narrow-oblong and under 3 cm. broad. In *R. molokaiensis* they are definitely broader and commonly 3-5 cm. in width.

Phyllostegia

Phyllostegia mollis var. **Skottsbergii** Sherff, Field Mus., Bot. Ser. 17: 577, 1939.

Phyllostegia mollis var. *resinosa* Fosberg, B. P. Bishop Mus., Occ. Papers 16: 345, 1942.

This variety was absent from my monograph of the genus *Phyllostegia* Benth. (B. P. Bishop Mus., Bull. 136: 12-59, figs. 3-19, 1935). It was based on specimens from far northwestern Kauai: *Wilder 451*, Kokee (type, Chi.; my photograph no. 3,363); *Cranwell, Selling, and Skottsberg 3,039*, Kalalau Trail, Kokee region (Goth.; my photograph no. 3,362).

Recently I have studied additional specimens from the same region: *Fagerlind and Skottsberg 6,581*, between Lehua makanoe [Lehuamakano] and Kilohana, March 13, 1948 (Goth.; my photograph no. 3,964); *idem 6,622*, along Kalalau Lookout trail, Mar. 14, 1948 (Goth.). These reveal a strong tendency, not mentioned in the original description of var. *Skottsbergii*, toward narrower leaves with base of the ovate-elliptic to lanceolate-oblong blade rounded or contracted, not truncate to cordate.

P. mollis var. *resinosa* Fosberg was based upon much the same kind of material, collected in the same vicinity (*Fosberg 12,696*, weak

shrub, flowers white, in wet forest, plateau at head of Kalalau Valley, Dec. 29, 1935; isotype in Chi.; my photograph no. 3,615). I can find no differences between it and var. *Skottsbergii*.



FIGURE 5.—*Phyllostegia mollis* var. *Fagerlindii* (type).

***Phyllostegia mollis* var. *Fagerlindii*, new variety (fig. 5).**

Caulis ramiqve brevissime sed densissime patenti-hispiduli (setulis e glandulosis) et glandulis minutissimis sessilibus vestiti. Pedicelli tenues, usque ad 1 cm. longi, glandulis sessilibus et setulis numerosis albidis e glandulosis patentibus vestiti. Foliorum membranaceissimorum lamina basi nunc rotundata nunc truncata subcordatave, supra ad venas dense alibi sparsissime adpresso-hispidula ac remote glandulo-punctulata; infra similiter hispidula sed densissime glandulo-

punctulata. Inflorescentia principalis racemiformis, verticellastris ± 8 , internodiis 2-4 cm. longis. Corollae tubus 1-1.2 cm. longus, labium inferius magnum etiam 8-10 mm. longum.

Stem and branches very shortly but very densely spreading-hispidulous (hairs glandless) and clothed with very minute, sessile glands. Pedicels slender, up to 1 cm. long, covered with sessile glands and numerous whitish, glandless, spreading hairs. Leaf-blades very membranaceous, at base now rounded now truncate or subcordate, above on veins densely elsewhere very sparsely appressed-hispidulous and remotely glandular-punctulate; below similarly hispidulous but very densely glandular-punctulate. Principal inflorescence racemiform, floral whorls ± 8 , internodes 2-4 cm. long. Tube of corolla 1-1.2 cm. long, lower lip large even 8-10 mm. long.

Specimens examined: *Fagerlind and Skottsberg 6,533*, above second house, Hanalei Valley, northernmost Kauai, Mar. 9, 1948 (type, Goth.; my photograph no. 3,965).

Apparently most nearly related to *P. mollis* var. *Skottsbergii*, discussed above. From that variety it differs in having the larger leaves with their blade broader and truncate to subcordate at base, flowers somewhat larger (corolla-tube a third longer), pedicels with no gland-tipped hairs (in var. *Skottsbergii* gland-tipped hairs are numerous and conspicuous under a lens), and so forth.

Phyllostegia grandiflora (Gaud.) Benth., Bot. Reg. **15**, no. 1,292 sub *Tribo 6, Prasieae*, 1830.—Sherff, B. P. Bishop Mus., Bull. **136**: 12-59, figs. 3-19, 1935.

Typically, *P. grandiflora* has its ovate leaf-blades basally wide-cuneate to truncate. The species is abundant on the island of Oahu. A specimen before me (*Fagerlind*, Kaala, Oahu, 1948; Goth., under *Fagerlind and Skottsberg distrib. no. 6,864*; my photograph no. 3,966) has the blades truncate to definitely subcordate. The pedicels of the florets are somewhat shorter (4-6 rather than 6-8 mm. long) and, somewhat curiously, have some of the hairs branched at the base—a character apparently heretofore overlooked in *P. grandiflora*. The large collection of *Phyllostegia* specimens belonging to the Chicago Natural History Museum is at present on loan elsewhere and so cannot be reexamined for branched hairs.

In connection with *P. grandiflora*, an error should be noted in my revisional treatment of the genus *Phyllostegia* (B. P. Bishop Mus., Bull. **136**). On page 13, under the first letter "j," both references to a variety β should be deleted. These were placed there originally

in allusion to *Degener and Shear 5,406*, illustrated in figure 3 of that work but not finally set off as typifying a valid variety.

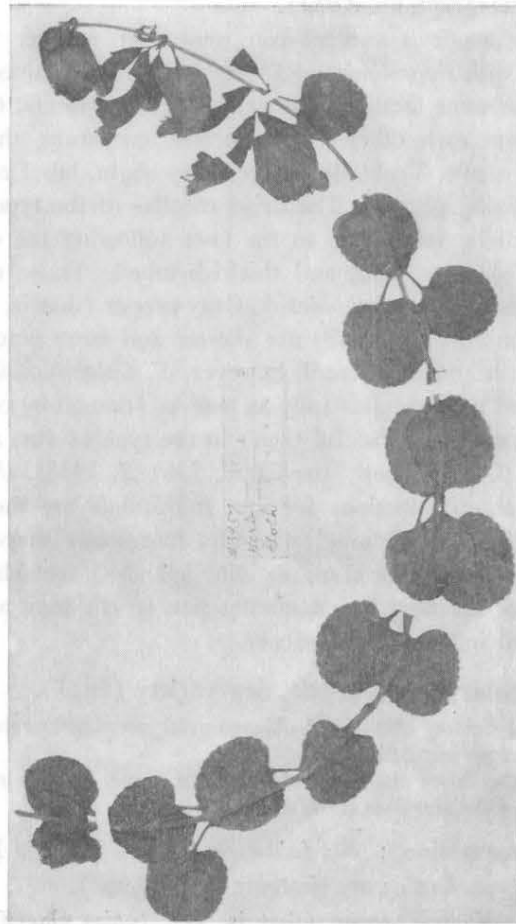


FIGURE 6.—*Stenogyne Calaminthoides* var. *subrotunda* (type).

Stenogyne

***Stenogyne Calaminthoides* var. *subrotunda*, new variety (fig. 6).**

Foliorum lamina subquadrato-rotundata, basi truncato-cordata, sub 3.4 cm. longa lataque, dentibus rotundioribus exapiculatisque, petiolo usque ad 1.5 cm. longo. Corolla moderate major.

Leaf-blades subquadrangular-rotundate, at base truncate-cordate, under 3.4 cm. long and wide, the teeth exapiculate and more rounded, petiole up to 1.5 cm. long. Corolla moderately larger.

Specimens examined: *Fagerlind and Skottsberg 6,249*, at Horner's place, a few miles south of Kilauea, Hawaii, Feb. 5, 1948 (type, Goth.; my photograph no. 3,957).

Skottsberg made a careful comparison of number 6,249, the present type, with *Fagerlind and Skottsberg 6,248*, obtained the same day and at the same locality. He writes: "No. 6248 and 6249 differ constantly from each other in flower size, curvature, thickness of tube and leaf shape. Truly, differences very slight, but I could easily separate the living plants." The dried corollas of the type's flowers, measured straight from base to tip (not following the curvature) are about 37-38 mm. long and thickish-tubed. Those of number 6,248, which is *S. Calaminthoides* A. Gray proper (that is, var. *typica* Sherff, *Brittonia* 6: 336, 1948) are shorter and more graceful. Elsewhere on the island of Hawaii, however, *S. Calaminthoides* proper may sometimes have corollas fully as long as (though by comparison, still more slender and graceful than) in the type of var. *subrotunda* (see Sherff, B. P. Bishop Mus., Bull. 136: 62, 1935). Apparently the most reliable distinctions for var. *subrotunda* are the squarish-rotund, basally more definitely cordate, marginally more rounded-toothed (with teeth devoid of definite apicules) leaf-blades, these probably never reaching the maximum size (6 cm. long and 4.5 cm. wide) attained in the species proper.

***Stenogyne kaalae* var. *latisepala*, new variety (fig. 7).**

Calycis lobi latiores oblongi vel oblongo-ovati, nonnulli marginibus remote patenteque spinuloso-serrulati.

Broader calyx-lobes oblong or oblong-ovate, some of them remotely and spreadingly spinulose-serrulate at the edges.

Specimens examined: *Nils Johan Andersson*, Nuuanu Pali, Oahu, June, 1852 (type, Goth.; my photograph no. 3,967).

S. kaalae Wawra proper (that is, var. *typica* Sherff, *Brittonia* 6: 337, 1948) is a species known definitely only from the Waianae Mountains of western Oahu. It is characterized by its narrow, subulate calyx-lobes. The specimen collected by Andersson in 1852 was obtained near the southeastern extremity of the great eastern, or main, mountain range of Oahu. The type locality, Nuuanu Pali, has had serious encroachments in recent years, due to the rapid expansion of nearby Honolulu, and this interesting variety may have become extinct.



FIGURE 7.—*Stenogyne kaalae* var. *latisejala* (type).

Dubautia

Dubautia plantaginea var. *typica* St. John, Torr. Bot. Club, Bull. 72: 26, 1945.

In a previous paper (Torr, Bot. Club, Bull. 73: 188-191, 1946), I remarked upon *D. plantaginea* Gaud. proper as being known today only from the island of Lanai in the Hawaiian Islands. It was separated by the alternate principal branches of its inflorescence from the more common *D. plantaginea* var. *Chamissonis* Sherff, known

from the islands of Kauai, Oahu, Lanai, Maui, and Hawaii. Recently a fine spray has been collected on Oahu (*Degener, Clay, and Greenwell 19,415*, tree 8 ft. tall, near summit, Dupont Trail, northern slope of Mt. Kaala, Feb. 22, 1949; Chi.). It is in no respect teratological, the panicle branches are alternate, but the leaves are narrowed at the bottom more as in var. *Chamissonis*, seeming to display a transition to that variety.

Here I may remark that if, as St. John (Torr. Bot. Club, Bull. 72: 26, 1945) maintains, var. *Chamissonis* is synonymous with the species proper, by him named var. *typica*, then, as pointed out by H. W. Rickett (Am. Jour. Bot. 36: 12, 1949), St. John's var. *typica* is "technically invalidated by at least one older varietal epithet" (in this case *Chamissonis*; for a still earlier discussion of this matter, see Torr. Bot. Club, Bull. 73: 188, 1946).

Dubautia laxa* var. *Greenwelliae Degener and Sherff, new variety (fig. 8).

Folia oblanceolata, supra glabra infra antrorsum strigosa, plerumque 5-9 cm. longa et 7-17 mm. lata. Inflorescentia laxa, atro-purpurea, ramis tenuissimis; capitulis vix pedicellatis, circ. 5-floris, bracteis lineari-oblongis, circ. 6 mm. longis, extus marginibusque plus minusve setosis, acheniis corpore circ. 3 mm. longis.

Leaves oblanceolate, glabrous above, antrorsely appressed-hispid beneath, commonly 5-9 cm. long and 7-17 mm. wide. Inflorescence lax, dark purple, its branches very delicate; heads scarcely pedicellate, about 5-flowered; bracts linear-oblong, about 6 mm. long, on outer surface and margins more or less setose; achenial body about 3 mm. long.

Specimens examined: *Greenwell* (*Degener distrib. no. 19,384*), near summit (approximately 2,000 ft. alt.), Wiliwilinui Ridge, Wai-lupe, Oahu, Dec. 6, 1948 (type, Chi., my photograph no. 3,955; isotype, NY, my photograph no. 3,956).

In my revision of the genus *Dubautia* (B. P. Bishop Mus., Bull. 135: 83-108, figs. 29-37, 1935), Miss Greenwell's plants would run in the key for *D. laxa* (p. 97) to the first "d" there given, and so, apparently, to var. *Bryanii*. But from that variety they differ in their somewhat smaller leaves, these strigose not glabrous beneath, their fewer and larger heads, the bracts about 6 mm. not about 2.3 mm. long, the achenial bodies about 3 mm. not about 2 mm. long, and so forth. Small-leaved extremes of *D. laxa* var. *pseudoplantaginea* may at times resemble the variety *Greenwelliae* material but can be distinguished by their glabrous lower leaf-surfaces.



FIGURE 8.—*Dubautia laxa* var. *Greenwelliae* (type).

Railliardia

Railliardia demissifolia Sherff, Bot. Gaz. 95: 78, 1933; B. P. Bishop Mus., Bull. 135: 118, fig. 38, 1935.

Heretofore known only from the island of Maui. It was described originally as a shrub ± 3 dm. tall. Specimens recently collected in South Kona, Hawaii, came however from a small tree: *Greenwell* (*Degener distrib. no. 19,231*), tree about 6-7 ft. tall, trunk 5-6 in. in diameter, flowers light yellow, along Papaloa Heifer Paddock Trail, Kealakekua Ranch, alt. 5,500 ft., Oct. 21, 1948 (BM, Chi., NY).

The leaves are disposed mostly in the ultimate 1.5 dm. of the branches and lack the drooping and overlapping effect so conspicuous on the fruticose specimens from Maui, but otherwise there appear to be no essential differences.

Railliardia ciliolata var. **trinervia** Hillebr., Fl. Haw. Isls., 226, 1888.

Hillebrand collected at least two specimens of his variety *trinervia*. One, his number 106, alt. 6,000 ft., central plateau of Hawaii, is at Kew (my photograph no. 2,640). The other, from the same plateau, was extant until recently in Berlin (my photograph no. 2,750). Hillebrand described the involucre bracts as 9-10 and the florets as 15-17.

Through the kindness of Dr. Skottsberg, I have been permitted to examine material collected in 1948 on the island of Hawaii: *Fagerlind and Skottsberg 6,129*, alt. about 2,500 m., Mauna Kea, southwest of Pohakuloa, Jan. 30 (Goth.). From this and certain other materials the variety is seen to have at times as few as five or six involucre bracts and as few as five to eight florets per head. The involucre are mostly about 5 mm. tall but in stunted heads are often only 4 mm. tall.

Lipochaeta

Lipochaeta lavarum var. **Hillebrandiana** Sherff, Bot. Gaz. 95: 89, 1933; B. P. Bishop Mus., Bull. 135: 59, fig. 20, 1935.

This variety has been known previously only from the southern coast of west Maui and from the island of Hawaii. The leaves were described as 2-3 cm. long and 3-7 mm. wide. Specimens recently collected in southeastern east Maui (*Degener, Clay, and Bertram 19,289*, along trail inland, or toward the mountains, from Hokukano, on aa lava wastes, Dec. 20, 1948; Chi.) have somewhat smaller leaves, these mostly 1-1.5 cm. long and 1.5-4 mm. wide.

Lipochaeta alata var. **pulchrior**, new variety (fig. 9).

Foliis varietati *acriori* similis, sed floribus ligulatis majoribus 1.8-2 cm. longis et 4-6.5 mm. latis differt.

Similar in its leaves to var. *acrior*, but differing in its larger ligulate florets, these 1.8-2 cm. long and 4-6.5 mm. wide across the ligule.

Specimens examined: *Fagerlind and Skottsberg 6,635*, along Kokee road, Puehu Ridge, Kauai, 1948 (type, Goth.; my photograph no. 3,959).

In *L. alata* Sherff (Bot. Gaz. 95: 81, 1933) and its variety *acrior* Sherff (*op. cit.* 82) the flowering heads are but 1.5-2 cm. in diameter, the ligulate florets measuring about 7-9 mm. long. The variety *pulchrior* differs conspicuously in having the flowering heads 3.6-3.8 cm. in diameter.

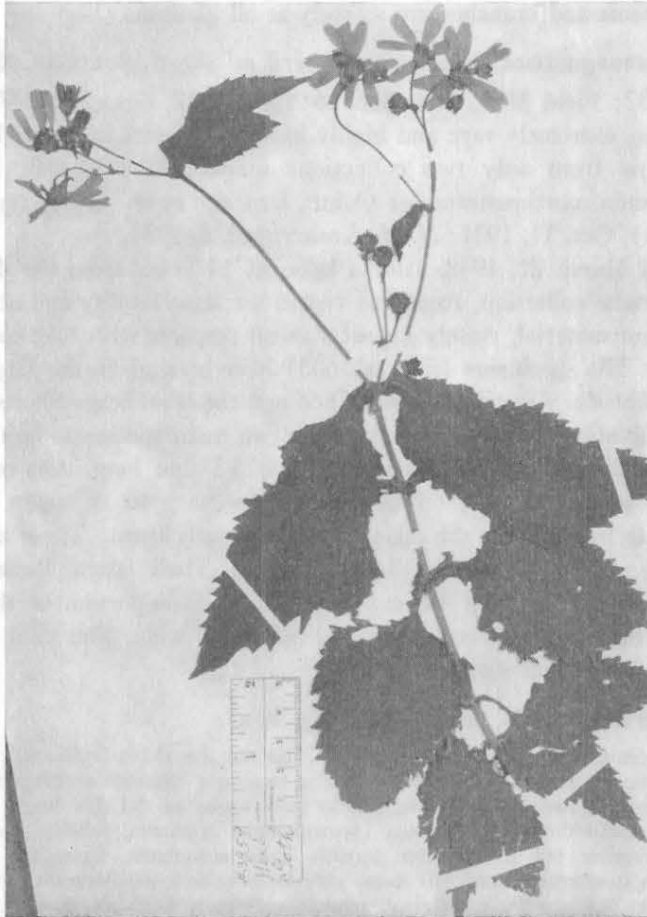


FIGURE 9.—*Lipochaeta alata* var. *pulchrior* (type).

Bidens

Bidens hawaiiensis A. Gray, Am. Acad. Arts Sci., Proc. 5: 128, 1861.

Heretofore, collectors have neglected to state just where on the islands of Hawaii and Maui they had found their plants of this

species. In April 1949, Robert Saiki obtained an excellent suite of flowering and fruiting specimens, growing on aa lava at Pahoa, in easternmost Hawaii (*Degener distrib. no. 19,564*; BM, 2 sheets; Chi., 3 sheets; NY, UCLA, etc.). The leaves range to a larger size (blade ± 12 cm. long and up to 6 cm. wide) than formerly known. The stems and branches are scarcely at all glaucous.

Bidens magnidisca Degener and Sherff *ex* Sherff, Bot. Gaz. 93: 216, 1932; Field Mus., Bot. Ser. 16: 110, pl. 17, figs. j-l, 1937.

This extremely rare and highly localized species has been known till now from only two collections made in the Koolau Range at Hauula, northeasternmost Oahu: *Degener et al. 4,080* (type collection), Oct. 11, 1931; *N. H. Krauss*, Jan. 6, 1934.

On March 21, 1948, after a lapse of 14 years from the date of the Krauss collection, Fagerlind visited the same locality and obtained excellent material, closely identical in all respects with that collected earlier. His specimens (field no. 603) have been given the *Fagerlind and Skottsberg distribution no. 6,666* and the label bears Skottsberg's determination as *B. magnidisca*. The two main specimens before me (*ex* Goth.) are lateral branches, some 3.5 dm. long. On one the leaves are all simple, on the other they vary to tripartite. Two separate leaves from the main stem accompany them. These are tripartite and have petioles 13-15 cm. long. Their lateral leaflets are 9.5-10.5 cm. long and 4-5 cm. broad. The blade-portion of the terminal one is 13-14.5 cm. long and 6-6.5 cm. wide. The total length of the larger leaf measures 3.2 dm.

Bidens napaliensis, new species (fig. 10).

Supra herbacea (parte inferiore non visa sed sine dubio fruticosa), omnino glaberrima. Caulis (saltem apicem versus ramosus) ramisque acriter tetragoni. Folia magna, opposita, petiolata petiolo tenui usque ad ± 1 dm. longo, petiolo adjecto ± 2.4 dm. longa; lamina (principalium) tripartita, foliolis subanguste ovatis acriter sed irregulariter serratis apice acuminatis, lateralibus subantrorsum spectantibus sessilibus itaque conjunctis valde inaequalateralibus ± 9 cm. longis et ± 4 cm. latis, terminali paulum majore in petiolulo ± 3 cm. longo. Inflorescentia exserta, cymosa, ramulis tenuibus ultimis (pedicellis) usque ad 1.7 cm. longis. Capitula numerosa (circ. 50 pro unico ramo in typo), radiata, pansa ad anthesin 1.5-2 cm. lata et 6-7 mm. alta. Involucri bractee exteriores 4-6, anguste lineares, plus minusve patentes, circ. 3-4 mm. longae; interiores plus minusve lanceolato-oblongae, apice contractae ac puberulae, usque ad 1.3 cm. longae. Flores ligulati 4 vel 5, flavi, sub 1 cm. longi; ligula obovata, apice rotundato plerumque denticulata; tubo tenuissimo. Paleae apicem versus angustatae, 1-2 cm. longae et achaenia matura facile superantes. Achaenia nigra,

obcompressa, anguste linearia, sub 1.3 cm. longa, faciebus glabra vel supra remote erecto-setosa, marginibus setis albidis acribus antrorsum setosa, apicem versus angustata, apice erecte setosa atque saepe obsolete 1- vel 2-aristata aristis nudis sub 1 mm. longis.

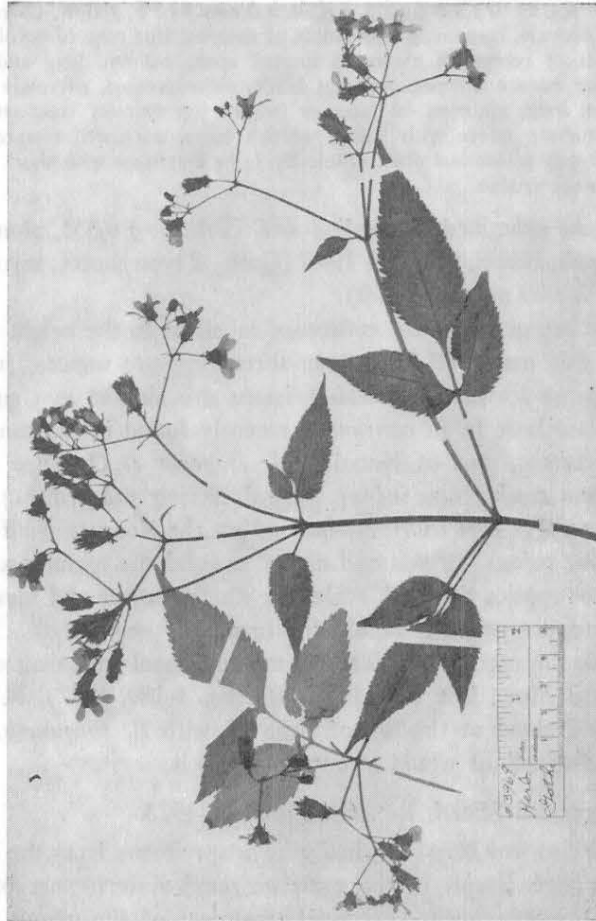


FIGURE 10.—*Bidens napaliensis* (from 1st type sheet).

Herbaceous above (lower portion not seen but undoubtedly shrubby), very smooth throughout. Stem (branched at least toward top) and branches sharply tetragonal. Leaves large, opposite, petioled, ± 2.4 dm. long including the petiole (this slender and up to ± 1 dm. long); blade (of principal leaves) tripartite; leaflets somewhat narrowly ovate, sharply but irregularly serrate, at apex acuminate; lateral ones pointing subantrorsely, sessile and thus closely conjoined, strongly oblique, ± 9 cm. long and ± 4 cm. wide; terminal one a little larger,

its petiolule ± 3 cm. long. Inflorescence exserted, cymose, the slender ultimate branchlets (pedicels) up to 1.7 cm. long. Heads numerous (about 50 to a single branch on the type), radiate, expanded at anthesis 1.5-2 cm. wide and 6-7 mm. tall. Exterior involucre bracts 4-6, narrowly linear, more or less spreading, about 3-4 mm. long; interior ones more or less lanceolate-oblong, narrowed and puberulous at tip, up to 1.3 cm. long. Ligulate florets 4 or 5, yellow, under 1 cm. long; ligule obovate, commonly denticulate at rounded tip; tube of corolla very slender. Pales of receptacle narrowed toward apex, 1-2 cm. long and easily surpassing the mature achenes. Achenes black, obcompressed, narrowly linear, under 1.3 cm. long, glabrous on faces or toward top sparsely erect-setose, at margins antrorsely setose with sharp, whitish hairs, narrowed toward apex, apex itself erectly setose and often obsoletely 1- or 2-aristate with short (under 1 mm.) and nude aristae.

Specimens examined: *Fagerlind and Skottsberg 6,555*, along cliff trail to Napali, Kauai, Mar. 10, 1948 (Goth., 2 type sheets; my photographs no. 3, 969 and no. 3,970).

No data are given on the collectors' labels as to the height of the plant, but this may well have been three or more meters, judging from the large leaves. The leaf-divisions are similar in shape but not in size to those in *B. conjuncta*, recently found in the same, the northwesternmost, part of Kauai (*vide Degener et Ordoñez 12,602 sub Bidentem conjunctam infra*). The flowering and fruiting heads are likewise suggestive of *B. conjuncta*, but the elongate chaff-scales (receptacular pales) surpass and almost conceal the mature achenes, while in that species the chaff-scales are much shorter and invariably leave the mature achenes visible for much of their length. In the key given to the species of *Bidens* in my revisional treatment of that genus (Field Mus., Bot. Ser. 16: 1-709, pls. 1-189, 1937), *B. napaliensis* would stand at the top of page 43 with *B. conjuncta*, from which the distinctions would at once separate it.

Bidens conjuncta Sherff, Bot. Gaz. 76: 162, 1923.

This species was based originally upon specimens from the Honokahau Drainage Basin, in the extreme northwestern part of west Maui. In my subsequent revisional treatment of the genus *Bidens* above cited, other collections were listed from Mt. Eke in west Maui and one was given from a ridge east of Nuuanu in the far southeastern part of Oahu. Since then, additional specimens have been studied. One of these was from a locality close to the Oahu habitat and three were from widely separated (northeasternmost, southernmost, and southeasternmost) parts of Kauai; *Degener and Ordoñez 12,602*, grassy slopes, Napali Trail between Makana and Waiahuakua,

Kauai, Dec. 24, 1939 (Chi.); *Fagerlind* 451 (*Fagerlind and Skottsberg distrib. no. 6,514*), near Lihue, Kauai, Mar. 7, 1948 (Goth.); *Fagerlind* 575 (*Fagerlind and Skottsberg distrib. no. 6,638*), Hanapepe Valley, Kauai, Mar. 16, 1948 (Goth.); *Fagerlind* 816 (*Fagerlind and Skottsberg distrib. no. 6,880*), Mt. Tantalus, Oahu, April 24, 1948 (Goth.).

These specimens are of the robust form with the large leaves, conjoined or sessile lateral leaflets, large achenes, and so forth, originally noted for the species and give evidence that it is worthy of standing apart from *B. sandvicensis* Less., with which it was compared in 1937.

