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Miscellaneous Notes on Hawaiian Plants—2

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This is the second paper in a series¹ of taxonomic and distributional notes on Hawaiian plants. It contains remarks on species of *Dryopteris*, *Korthalsella*, *Geranium*, *Vaccinium*, *Lepechinia*, *Phyllostegia*, and *Coprosma*, with new combinations in *Dryopteris*, *Geranium*, and *Vaccinium*, a new name in *Vaccinium*, and a new variety in *Phyllostegia*. Collections cited are in the herbarium of Bishop Museum, except those indicated as U. S. National Herbarium (U.S.), Gray Herbarium (Gr.), or Herbarium of Mr. Otto Degener (D).

DRYOPTERIS

Dryopteris goggilodus (Schkuhr) Fosberg, n. comb.

Aspidium goggilodus Schkuhr, Vier und zwanzigste Klasse des Linnéischen Pflanzensystems oder Kryptogamische Gewächse I, etc. 193, t. 33c, 1809.

Polystichum goggilodus (Schkuhr) Gaud., Freyc. Voy. Bot. 326, 1827.

Cyclosorus gongylodes Link, Fil. Hort. Reg. Bot. Berol. 2: 128, 1833.

Dryopteris gongylodes O. Kuntze, Rev. Gen. Pl. 2: 811, 1891.

Cyclosorus goggilodus Farwell, Am. Midl. Nat. 12: 259, 1931; Ito, Bot. Mag. Tokyo 51: 713, 1927.

For those who do not care to follow the current dismemberment of the genus *Dryopteris*, the above name is correct for the widespread species commonly known as *Dryopteris gongylodes*.

¹ See B. P. Bishop Mus., Occ. Papers 12 (15): 1-11, 1936.

Link gives no reason for his alteration of Schkuhr's name to *gongylodes*, but it is presumed that it was because of a desire for a more correct Latinization of the Greek adjective from which the name was derived. My colleague, Dr. F. J. Hermann, has made the following observation: "‘Goggilodus’ was an unintentional orthographic error for ‘gongylodes’: γογγυλωδης cannot be correctly transliterated otherwise than as Link did it. ‘Gongylodes’ is an authentic Latin adjective having the same meaning as its Greek original, ‘roundish’ [referring in this case to the rounded lobes of the pinnae], while ‘goggilodus’ is meaningless."

I agree that it is an orthographic error, but see no reason to believe that it was unintentional. As engraved on the plate (*loc. cit.*, t. 33) it was spelled "goggylodus", but in the text and index it was changed to "goggilodus." Article 59 of the rules says, "A name or epithet must not be rejected, changed or modified merely because it is badly chosen, or disagreeable, . . .", and several of the examples given are comparable to the present case. Article 70 permits modification only in the event of a typographic or "clearly unintentional orthographic error." The burden of proof lies, therefore, with the one who makes the change. A man of Schkuhr's attainments would, at that time, certainly have been familiar with the accepted transliteration of Greek to Latin. It was evidently a matter of personal choice with him, and there is nothing in the rules which determines how any word shall be Latinized. (See examples of retention of original spelling under Article 70.)

In the Hawaiian islands, the species is usually found in valley bottoms in moist lowlands, especially around ancient Hawaiian taro patches. It is common throughout Polynesia except on low coral islands.

KORTHALSELLA

In a recent revision (*Bull. Jard. Bot. Buitenz. III, 14: 115-159, 1937*; see also *Danser, Bull. Jard. Bot. Buitenz. III, 16: 330-340, 1940*) B. H. Danser gives a very usable treatment of this extremely difficult genus of Loranthaceae, one of the major centers of development of which is in the Hawaiian islands. Since the key to the whole genus includes so many species that it is rather difficult to use, and since it may not be available to many botanists in Hawaii, Dr. Danser has, at my request, prepared a key to the Hawaiian species only. This,

with a few minor additions and alterations, is given below, with a statement of those of the Hawaiian islands on which each species is known to occur. My sincere thanks are due to Dr. Danser for his willingness to permit me to publish the key, and for determining almost all of my collections of *Korthalsella*.

KEY TO THE HAWAIIAN SPECIES OF KORTHALSELLA

1. Axils and branches decussate..... 2
Axils and branches bifarious..... 3
2. Adult internodes nearly terete, inflorescences united into a ring (Oahu, Molokai, Lanai, Maui)..... *K. remyana* Van Tieghem.
Adult internodes somewhat flattened, axillary flower-groups somewhat separated (Kauai)..... *K. remyana* var. *wawrae* (Van Tieghem) Danser.
3. Internodes nearly terete..... 4
Internodes distinctly flattened..... 5
4. Stems once or twice branched, with pennate appearance (Lanai, Molokai, Oahu, Maui²)..... *K. cylindrica* (Van Tieghem) Engler.
Stems several times branched, with bushy appearance (Oahu).....
..... *K. degeneri* Danser.
5. Internodes slightly flattened, stems once or twice branched, with pennate appearance (Oahu)..... *K. cylindrica* var. *planiuscula* Danser.
Internodes, with exception of lowermost ones, strongly flattened, usually ribbed 6
6. Plant slender, elongate, internodes usually 5-8 times as long as broad, forming together long ribbonlike phylloclades, usually over 15 cm. long (Oahu, Lanai, Maui, Kauai).....
..... *K. platycaula* (Van Tieghem) Engler.
- Plant stiff and robust, internodes and phylloclades shorter..... 7
7. Internodes usually 1-5 times as long as broad, often somewhat cuneate, together forming ovate-lanceolate to linear-lanceolate phylloclades (Kauai, Oahu, Molokai, Lanai, Maui, Hawaii).....
..... *K. complanata* (Van Tieghem) Engler.
Like the latter, but internodes more completely united to lanceolate phylloclades, and 15-35 mm. broad, the broadest internodes nearly as long as broad (Kauai, Oahu, Molokai, Hawaii).....
..... *K. latissima* (Van Tieghem) Danser.
(Specimens of the latter with internodes 1-2 mm. thick (Hawaii) comprise..... *K. latissima* var. *crassa* (Van Tieghem) Danser.)

GERANIUM

Geranium multiflorum Gray var. *ovatifolium* (Gray) Fosberg, n. comb.

Geranium ovatifolium Gray, U. S. Expl. Exped., Bot., 314, t. 30, 1854.

² Maui, west: Puu Kukui, between Haelau [Haelaau, above Kaulalewelewe] and Nakalalua, alt. 900 m., Fosberg 10050.

Differs from var. *typicum* in having the leaves, cymes and calyces sericeous instead of pilose, and from var. *canum*, to which it is most closely related, in having the upper surface of the leaves sericeous instead of green, and in having the cymes and calyces more densely and longer silvery-sericeous pubescent.

Endemic in east Maui.

Maui, east: *U. S. Expl. Exped.* (Gr.) (type); *U. S. Expl. Exped.* (Gr.) (one piece mounted on same sheet as type of *G. cuneatum* var. *hololeucum*); Koolau Gap, Haleakala, *Degener 12136* (D).

In 1936 [B. P. Bishop Mus., Occ. Papers 12(16):9] I reduced *Geranium ovatifolium* outright to *G. multiflorum* var. *canum* on the basis of the description and a U. S. Exploring Expedition fragment in the Bishop Museum herbarium, which I thought to be a part of the type material. Since then, Otto Degener has sent me his collection (cited above) which is neither var. *typicum* nor var. *canum*. I have also had opportunities to examine the original material of *G. ovatifolium* in the Gray Herbarium and the U. S. National Herbarium. This is a mixture, since the sheet in Gray Herbarium is the form described above, with the upper leaf surface sericeous, practically identical with the material sent by Degener, while the sheet in Washington is certainly var. *canum*. Both are simply labelled Maui. It seems logical to typify Gray's species as the form on the Gray Herbarium sheet, making the name *ovatifolium* thereby available for the variety with sericeous upper leaf surfaces, as the other has already been described as var. *canum*. Another specimen of var. *ovatifolium* is on the same sheet as the U. S. Exploring Expedition collection of *G. cuneatum* var. *hololeucum* in the Gray Herbarium. It bears a note in Gray's hand (fide Weatherby) that it came from "N. Bank of Crater E. Maui", though the label gives only "Sandwich Islands." The other specimens on the sheet must have come from the island of Hawaii. This and the following examples show the impossibility of drawing positive conclusions as to the typification of Gray's U. S. Exploring Expedition species from the specimens at either Gray Herbarium or U. S. National Herbarium alone, or from the sets distributed to various other institutions. Whenever possible all the material available to Gray should be examined to decide critical cases.

***Geranium cuneatum* Hooker.**

Examination of the original material of two of Gray's varieties of this species, var. *hololeucum* and var. *hypoleucum*, shows mixtures,

only var. *menziesii* being entirely as commonly interpreted. Of var. *hololeucum*, the sheet in Washington is entirely *G. cuneatum* var. *tridens*, while that at Gray Herbarium has two pieces of the silvery form from Hawaii, commonly interpreted as var. *hololeucum*, besides the piece of *G. multiflorum* var. *ovatifolium* mentioned above. Nothing would be gained by any typification of this variety other than that commonly accepted, the form from Hawaii with leaves silvery on both sides, with the Gray Herbarium sheet as type. The U. S. National Herbarium sheet of var. *hypoleucum* has, in addition to the Hawaii plant with leaves silvery beneath (generally accepted as var. *hypoleucum*), a piece of *G. humile*, resembling in habit var. *kauaiense*, but when examined under a lens the leaf veins appear slightly silky above, as in var. *mauiense*. The sheet is labelled Hawaii, but this piece may well have come from Maui. It is not inconceivable, however, that the open bogs of the Kohala Mountains, Hawaii, might yet yield this species if they were searched for it. The name *G. cuneatum* var. *hypoleucum* is retained for the form of *G. cuneatum* to which it has hitherto been applied.

These examples may be taken to show the necessity for critical examination of the U. S. Exploring Expedition specimens before positive disposition is made of Gray's species. Copies of the labels should also be made, as the paper used is, at least in Washington, rapidly becoming blackened with age, making the writing illegible.

VACCINIUM

The characters used to separate *Vaccinium dentatum* Smith from *V. calycinum* Smith in Skottsberg's key (B. P. Bishop Mus., Bull. 43: 69, 1927) were found to be rather difficult to apply to some specimens, as it is often merely a matter of opinion as to whether leaves are coriaceous or chartaceous. The degree of leaf serration also varies, especially in Oahu specimens. Other characters, such as size of parts, stature and hairiness, vary so that in certain specimens only an aggregate of characters gives a clue to which species is concerned.

Considerable field observation and study of herbarium material give several clues, though by no means a positive means of differentiation between them.

The corollas of these two species show a few points of difference that may be useful to supplement the characters given in Skottsberg's

key, though, independently, they are not more constant than the leaf characters used by Skottsberg. The corolla of *V. calycinum* tends to be cylindrical, slightly narrowed at the top, sparsely pilose-puberulent outside, green or with slight coral markings, thin and translucent when dried. That of *V. dentatum* tends to be ovoid, more narrowed at the top, more nearly glabrous outside, deep coral to dark red with green lobes, firm and opaque when dried (Kauai specimens seem to be more translucent). These characters, it must be understood, vary considerably, perhaps as much as the leaf characters, but should be useful in identifying flowering material. Also, many specimens of *V. dentatum* have the leaves as prominently reticulate when dried as *V. reticulatum* and its close relatives. The areolation in *V. dentatum* is larger, in proportion to the leaf size, than that in *V. calycinum*.

Three collections from Oahu, cited below, have leaves larger than the limits given by Skottsberg for *C. dentatum*, thinner, and with a tendency toward irregularity in the serrations. However, in none of these characters could they be considered good *V. calycinum*. Their stature is that of *V. calycinum* rather than *V. dentatum*. The flowers of the two Manoa-Palolo collections are near those of *V. calycinum*, though with more red color, but do not have the pubescence on the calyx, receptacle, and pedicel characteristic of the Oahu form of *V. calycinum*. The berries of at least one collection are sweet, with a slightly bitter after-taste, rather than bitter and unpalatable as in *V. calycinum*. These may be regarded as "intermediates" or as of hybrid origin. If the latter interpretation is not accepted, the limits between the two species, already too close, seem to vanish. Specimens under discussion: Oahu, Koolau Mts.: Manoa-Palolo Ridge, above Woodlawn, alt. 475 m., *Fosberg 13702*; same locality, alt. 500 m., *Fosberg 9281*; ridge south of Helemano Gulch, Paalaa, alt. 540 m., *Fosberg 10308*.

In his later notes on Hawaiian *Vaccinium*, Skottsberg (*Acta Horti Gothob.* 12: 145-151, 1937) provides no epithet for the typical form of *V. calycinum*, with which he considers *V. reticulatum* f. *grandifolium* Wawra synonymous. It may be referred to as **Vaccinium calycinum** Smith f. **grandifolium** (Wawra) Fosberg n. comb. (*V. reticulatum* Smith f. *grandifolium* Wawra, *Flora* 56: 60, 1873.)

Plants from Molokai, Wailau-Mapulehu divide, *Fosberg 13511*, and from Hawaii, Kilauea, Chain of Craters, between Makaopuhi and

Napau Craters, Fosberg 10106, seem to belong with the Maui ones, in this form.

The plant found on Kauai, which Skottsberg includes in the typical form, is almost deciduous, nearly glabrous, with large thin leaves and very large calyx lobes. This seems to be the basis of L  veill  's *V. hamatidens*, so that name should be used, but in a lower category—**Vaccinium calycinum** Smith f. **hamatidens** (L  veill  ) Fosberg, n. comb. (*Vaccinium hamatidens* L  veill  , in Fedde, Repert. 10: 152, 1911.) It would be confusing to take up Wawra's epithet f. *calycinum* for this form, as it is not the typical form of the species, though perhaps this would be more nearly according to the rules.

The plants designated as f. *grandifolium*, f. *faurei*, f. *fimbriatum*, f. *meyenianum*, and f. *hamatidens* taken together may be referred to **Vaccinium calycinum** Smith var. **grandifolium** Fosberg, new name.

The subdivisions of *Vaccinium calycinum* may be arranged as follows:

Vaccinium calycinum Smith.

var. *grandifolium* Fosberg (typ. var.)

f. *grandifolium* (Wawra) Fosberg (typ. f.)

f. *hamatidens* (L  veill  ) Fosberg.

f. *faurei* (L  veill  ) Skottsberg.

f. *fimbriatum* Skottsberg.

f. *meyenianum* (Klotzsch) Skottsberg.

var. *montanum* (Wawra) Skottsberg.

Skottsberg (Acta Horti Gothob. 12: 143, 1937) cites only Maui specimens for the other variety of this species, *V. calycinum* var. *montanum* (Wawra) Skottsberg., but the type locality is given by Wawra (Flora 56: 61, 1873) as "Kauai; Hochplateau des Waialeale", and the label on his specimen no. 2180 (see Skottsberg, B. P. Bishop Mus., Bull. 43: pl. 8, 1927) bears this out. This variety apparently occurs on both Kauai and Maui.

Vaccinium pahalae Skottsberg. has been known previously from the islands of Hawaii and Molokai (Skottsberg, B. P. Bishop Mus., Bull. 43: 77, 1927, and Acta Horti Gothob. 12: 149, 1937), and from Oahu (Fosberg and Hosaka, B. P. Bishop Mus., Occ. Papers 14: 3, 1938). On Molokai and Oahu, at least, it is a plant which grows in open bogs, with the woody stems buried in moss, and only the leafy tips exposed. I have not seen its habitat on Hawaii.

A collection from west Maui, Puu Kukui, between Nakalalua and the summit, in an open bog at about 1,770 m. altitude (*Fosberg 10031*) is obviously *V. pahalae*. It is perhaps less hairy than is usual for this species, and the stems have a strong tendency to be angular in the herbaceous portion near the tips, but in other characters it seems typical. It is surprising that this species should not have appeared in collections previously, considering the number of botanists who have collected on Puu Kukui. The material has somewhat immature fruit.

LEPECHINIA

Lepechinia Willd., Hort. Berol. 1: 21, 1803.

Sphacele Bentham, Bot. Reg. 15: 7, 1289, 1829.

Epling (Fedde, Repert. Beiheft 85: 15, 1935) has pointed out that the genus *Sphacele* is indistinguishable from the South American *Lepechinia*. The latter name is earlier, so that the species of *Sphacele* had to be transferred to *Lepechinia*. Epling has done this (loc. cit., pp. 19-27) for the South American species, and has recently, in a paper on American Labiatae made the combination for the one Hawaiian species, thus making the correct name available for use in Hawaii. As it might well be overlooked in a paper on American plants, attention is here directed to it. *Sphacele* Bentham is in the list of conserved names, but is not conserved over *Lepechinia*.

Lepechinia hastata (Gray) Epling, Bull. Torr. Club 67: 511, 1940.

Sphacele hastata Gray, Am. Acad. Arts Sci., Proc. 5: 341, 1861.

The distribution of this species is very interesting—Hawaiian islands, Maui, slopes of Haleakala; Revillagigedo Islands west of Mexico; Baja California. Thus, it is one of the few undisputed American components of the Hawaiian flora. I have found no evidence to support the suggestion that this species may be a post-European introduction.

PHYLLOSTEGIA

Phyllostegia glabra Bentham var. **macraei** (Bentham) Sherff, Bot. Gaz. 96: 136, 1934; B. P. Bishop Mus., Bull. 136: 31, 1935.

The collections cited below extend the range of this variety to Molokai. Its previous range, as given by Sherff, is Oahu, Lanai, Maui, and Kauai (?). The larger-flowered typical variety of the species is confined to Oahu.

Molokai: trail up Waikeakua-Waiokeela ridge, head of Wailau Valley, Dec. 27, 29, 1936, *Fosberg 13449, 13498*.

Phyllostegia mollis (Gaud.) Benth. var. **resinosa** Fosberg, n. var.

Caulis canaliculatus glandulosus, foliis ovato-ellipticis subtus resinoso-punctatis basi rotundatis; inflorescentia glanduloso-hirtella, pedicellis circ. 10 mm. longis, calyce 6 mm. longo resinoso, tubo corollae circ. 9 mm. longo, labio inferiore 1 cm. longo, superiore 4 mm. longo.

Suffrutescent herb, stems 4-sided, angles rounded, sides deeply channeled along the center, shortly grayish retrorse-pubescent, with minute resin droplets scattered among the hairs; leaves with blades up to 9-10 cm. long, up to 4.5-5 cm. wide, ovate-elliptic, rounded at base, acuminate at apex, glabrate above, hirtellous and resinous-punctate beneath, petiole up to 3 cm. long; inflorescence loose, of 5-7 whorls of 6 flowers each, internodes 2.5-3 cm. long, some branches producing dwarfed inflorescences of 2 or 3 whorls on short lateral branchlets, main axis and pedicels densely spreading- or somewhat retrorse-hirtellous with many of the hairs resinous-gland tipped; pedicels about 10 mm. long; calyx 6 mm. long, teeth narrowly triangular, 1 mm. long, calyx thickly covered with minute droplets of golden resin, sparsely hirtellous; corolla tube about 9 mm. long, straight to somewhat curved, lower lobe 1 cm. long, upper 4 mm. long.

Differs from the species in leaf shape, length of pedicel, abundance of glands on the inflorescence, larger calyx, and larger corolla, especially the lower lip. Resembles var. *lydgatei* but differs in leaf shape, longer pedicels, larger lower corolla-lip, and in the abundance of resin droplets on most parts of the plant.

This variety keys down in Sherff's revision to *P. electra*, which it strikingly resembles in most respects, but the corolla is that of *P. mollis*, with a greatly expanded lower lip rather than the small lower lip of *P. electra*.

Kauai: plateau at head of Kalalau Valley, in wet forest, alt. 1,230 m., Dec. 29, 1935, *Fosberg 12696* (type).

The type sheet is deposited in the herbarium of Bishop Museum. Isotypes will be distributed to several other institutions.

COPROSMA

Coprosma faurei Lévillé.

Extensions of range may be reported for all three varieties of this species. Var. *typica*, known only from the Hanapepe Valley, Kauai (see Oliver, B. P. Bishop Mus., Bull. 132: 162, 1935), was found on a moist open-wooded slope on the southeast side of Kumuwela Ridge, above Waimea Canyon, Kauai, *Fosberg 12651*. Var. *oahuensis*, known from the region about Puu Kaala, Waianae Mountains, Oahu (Oliver,

loc. cit.) is found also in the south end of the Waianae range: east side of Manawahua ridge, north of Pau Manawahua, alt. 740 m., March 15, 1936, *Alice A. Nightingale*; Palehua, Honouliuli-Nanakuli divide, alt. 750 m., *Fosberg 13806*. The fruit of these two collections is about 1 cm. long, and orange-yellow in color. I have not found it with mature fruit in the region about Kaala, but Oliver gives the fruit length for the species as 7 mm. Var. *lanaiensis* was found on a bare, windswept ridge below the edge of the forest, below Puu Aalii, between the Maunalei and Hauola drainages, Lanai, alt. 750 m., *Fosberg 12467*. It was also found on Molokai, where it has not been reported before, in moist forest on the Manawai-Kahananui ridge, alt. 600 m., *Fosberg 13397, 13398*. These specimens agree with the Lanai plants except that they are slightly less hairy on the twigs, being minutely appressed puberulent. The fruits are 6 mm. long. *C. stephanocarpa*, which is of this general relationship, is supposedly distinguished by having narrow, acuminate stipules (Oliver, B. P. Bishop Mus., Bull. 132: 158, 1935) while those of *C. faurei* are said to be acute. This distinction is not very useful, as on *C. faurei*, in all of its varieties, the stipules are more or less acuminate. Furthermore, the glabrous part of var. *lanaiensis* is pubescent in its early stages. However, the identity in every respect of the plants under discussion with those undoubtedly belonging to *C. faurei* would seem to preclude their being *C. stephanocarpa*. The relation between these two species merits further study.

C. faurei is ordinarily found in relatively dry situations, often at or near the lower edges of the forests. It is a rather scandent shrub, forming tangles, and often climbing on other plants. I have not seen it in what could be called a rain forest, or in really dense forest of any kind.

Coprosma ernodeoides Gray.

Of my eight collections of this species cited below, taken at random in different localities on Maui and Hawaii, six prove to be intermediate between var. *typica* and var. *mauiensis*. Of the Hawaii collections 10150 has the pyrenes about 5.5-6 mm. long, rather than 7 mm. as is correct for var. *typica*; 10157 has no cilia on the leaves; 10428 has small leaves, no cilia and the pyrenes 5 mm. long, and will, I think, have to be referred to var. *mauiensis*, in spite of the fact that it comes from Hawaii. The only resemblance to var. *typica* is in the slightly too broad leaves and somewhat acute pyrenes. Of the Maui collections,

9967 has the pyrenes 6 mm. long, 10001 has them slightly over 5 mm., and 9923 has some of them as much as 6.5 mm., and all have them acute at one end. Otherwise they resemble the rest of the Maui plants. The remaining two collections, 9944 and 10000, are typical var. *mauiensis*. It is assumed that the remarks about seeds in the original descriptions refer to the pyrenes.

Maui, east: Haleakala Crater floor, Halemauu Trail, between Bottomless Pit and foot of pali, *Fosberg* 9923; Haleakala Crater, Sliding Sands Trail, *Fosberg* 9944; slopes of Haleakala, between top of Halemauu Trail and end of road at Puu Niauniau [Puu Nianiau], *Fosberg* 9967, 10001; Haleakala Crater, Halemauu Trail between foot of pali and rim, *Fosberg* 10000.

Hawaii: Volcano Road, not far below the Museum, Kilauea, *Fosberg* 10150, 10157; Puu Oo Trail, above Olaa Flume, Hilo District on lava flow, *Fosberg* 10428.

