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Ophioglossum, Rollandia, and Scaevola
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INTRODUCTION

The types and the other specimens cited are in Bishop Museum, Honolulu, except when indicated otherwise by a parenthetical abbreviation. (Ca-Gr.) stands for the Gray Herbarium, Cambridge, Massachusetts. These abbreviations are the standard ones proposed by J. Lanjouw (Chronica Botanica 3 : 345-349, 1937).

OPHIOGLOSSACEAE

Ophioglossum falcatum (Presl) Fowler, Am. Fern. Jour. **30**: 10, 1940.

Ophioderma pendulum (L.) Presl, *β falcatum* Presl, Böhm. Gesell. Wissensch., Abh. V, **4**: 316, 1847 (1845); also as repaged reprint, Suppl. tent. Pterid. 56, 1847 (1845).

Ophioglossum furcatum J. Smith, Ferns Brit. and For. 272, 1866, a nomen nudum alleged to be based on a non-existent name-bringing synonym, not *O. furcatum* Roxb., Calcutta Jour. Nat. Hist. **4**: 478, 1844.

Ophioderma falcatum Degener, Fl. Hawaiiensis, fam. 1, Sept. 10, 1932.

Ophioglossum pendulum L. ssp. *falcatum* (Presl) Clausen, Torrey Bot. Club, Mem. **19**(2) : 117, 1938.

[1] This is the ninth of a series of papers designed to present descriptions, revisions, and records of Hawaiian plants. The preceding papers have been published as B. P. Bishop Mus. Occ. Papers **10** (4), 1933; **10** (12), 1934; **11** (14), 1935; **12** (8), 1936; **14** (8), 1938; **15** (1), 1933; **15** (2), 1939; **15** (22), 1940.

Ophioglossum pendulum L. was raised to generic status as *Ophioderma* by Endlicher, in his Genera Plantarum (66, 1836-40). Subsequently several other species have been put with this segregate. It has been redefined by the several authors who have adopted it, but the diagnostic characters used have been: plant epiphytic; the pendent fertile frond attached near the middle of the sterile; veins of sterile frond all connecting, the veins free at base of frond. *Ophioglossum* has, in contrast, been separated as plant terrestrial, having the erect fertile frond attached to the petiolar base of the sterile frond; veins of sterile frond ending in tertiary veinlets free and included, the veins flabellate at base of frond.

Few botanists have considered *Ophioderma* a good segregate. Many have rejected it as lacking adequate characters to form a natural group, and have restored it to *Ophioglossum,* among these being, Seemann, Hillebrand, Hooker and Baker, Beddome, Bitter in Engler and Prantl, Drake del Castillo, F. M. Bailey, Domin, Copeland, Christensen, E. D. W. and F. B. H. Brown, and many others.

The possession of an epiphytic habit is in itself unimportant, and it is not constant in the species concerned. Among the many species of *Ophioglossum* there are many stages of fusion between the sterile and fertile fronds, and hence various levels at which the fruiting spike separates from the other. The pattern of venation does not seem to provide a basis for the separation of natural genera in this group. R. T. Clausen, the latest monographer of the family, concurs in the treatment of all these plants as the single genus *Ophioglossum.* This generic placement seems the best.

The notes printed here are submitted in an attempt to determine the taxonomic position of the common epiphytic *Ophioglossum* of Hawaii and the one of Polynesia. Numerous authors have published on this, their opinions in most instances being based only on the study of dried specimens, or on the added field knowledge of only one of the two plants. The writer is familiar with the common Hawaiian plant, and he has observed or collected the other in Fiji, the Society Islands, the Austral Islands, and on Rotuma Island. Throughout this field acquaintance the two have seemed very distinct species. Clausen recognizes the two, but makes the Hawaiian plant a subspecies of the plant of Polynesia and Malaysia, in his monograph (Torrey Bot. Club, Mem. **19**(2): 117, 1938). The writer has ex-

amined the collections in Bishop Museum and the Gray Herbarium. As Clausen indicated, tangible morphological characters are few and elusive in this genus.

The plant of Tahiti, Fiji, and the South Sea Islands is easily distinguished in the forests, growing as an epiphyte on mossy tree trunks or branches. It forms clumps a decimeter or more in diameter at base. The numerous fronds are soft, weak and pendent, and hang down below the branch. The fronds of a well-grown plant are from 4 to 18 dm. long, simple or one or more times forked, often deeply so, and spiralling or twisted several times toward the tip. From herbarium study other characters can be added: the frond being thin and soft, the veins prominent, when dry the thin tissue shrinking and making the veins conspicuous, the meshes of the vein network coarse (the median ones half way from the base 2.5-6.5 cm. long); the stalk of the fertile spike 0.8-10 cm. long; and the fertile spike 1.5-48 cm. long, pendent.

This is the original *Ophioglossum pendulum* L., Sp. Pl. ed. 2, 2: 1518, 1763, where it was given a few words of description, said to come from the Indies (not India as Clausen states on p. 116), and based upon *Scolopendria major* Rumphius (Herb. Amboinense 6: 84, t. 37, fig. 3, 1750). Rumphius' figure is clear and excellent, and his description is detailed and half a page in length. He gives the Malayan common name as "Daun rambu" and that in Ceram as "Ayhua naroe." Rumphius does not attribute his plant to the Indies in so many words, but his flora was principally concerned with the plants of the small island Amboina in the Netherlands East Indies, where he lived. He does not definitely state a type locality, but gives the Malayan and the Ceram common names. Ceram is the nearest island to Amboina. C. B. Robinson collected a topotype of *Scolopendria major* Rumph. and *Ophioglossum pendulum* L. on Amboina, and E. D. Merrill so determined it (Interp. Rumph. Herb. Amb. 70, 541, 1917). J. B. Steere also collected it there. Though Rumphius may well have seen this common epiphyte of the Indo-Malayan tropics at other localities, it seems clear that the type locality was the island of Amboina. The fern occurs from Madagascar and Ceylon through Malaya, the Philippine Islands, Formosa, Malaysia, Micronesia, eastern Australia, Melanesia, and Polynesia as far east

as the Austral Islands, the Society Islands, Makatea, and the Marquesas Islands.

No authentic living plants or dried specimens of this are known from the Hawaiian islands. Clausen, expressing the opposite view (Torrey Bot. Club, Mem. **19** (2): 117-118), cites the specimen, Kauai: Kilohana, W. Wendte, and states that the typical plant [*O. pendulum* ssp. *typicum*] does occur there sparingly. This Wendte specimen, found in the Gray Herbarium, is large, the fronds attaining a length of 58 cm., but they are firm, thick and falcate, the veins are obscure, the median ones forming meshes 20-25 mm. long, and the fertile spikes are 6 and 9 cm. long, on stalks 2 cm. long. Close checking of the monograph by Clausen shows that the Kauai, Kilohana, W. Wendte specimen in the Gray Herbarium, was cited on page 117 as *Ophioglossum pendulum* ssp. *typicum,* then again on page 118 as *Ophioglossum pendulum* ssp. *falcatum.* The Gray Herbarium has only one sheet of this collected by William Wendte. There is no evidence of a mixture of specimens as it contains one large plant with three fronds and one detached similar frond. There seems no justification for citing the Wendte specimen under both of the subspecies. With certainty, this is redetermined as the usual Hawaiian plant, not *Ophioglossum pendulum* L. The true *O. pendulum* is not known from the Hawaiian islands.

To the scientific binomial Clausen added a subspecific name, ssp. *typicum* Clausen. There is nothing wrong in such a treatment, but it seems unnecessary to encumber the name thus, especially as the only other subspecies is now made an independent species. Hence, *Ophioglossum pendulum* L. ssp. *typicum* Clausen is reduced to the synonymy of *Ophioglossum pendulum* L.

The Hawaiian fern of this group has proved to be a distinct species. It is also an epiphyte on damp trunks or branches deeply covered with mosses and liverworts in the rain forest at middle elevations in the mountains. The short rhizome produces one or few (1-6) fronds. The fronds are firm, thick, opaque, plane, falcate, and diverge or descend at various angles from the attachment. The fronds of a well-grown plant are from 13 to 58 cm. long, simple (or rarely abnormally shortly lobed). The sterile frond being firm, thick, opaque, the veins nearly concealed; the intercostal tissues not collapsing or shrinking from the veins on drying; the meshes of the vein network

medium sized (the middle ones half way from the base 0.8-3 cm. long); the stalk of the fertile spike 0.6-2.5 cm. long; and the fertile spike 3-11 cm. long.

Various authors have recognized this Hawaiian plant as distinct, but it has not up to the present been correctly named. Greville and Hooker in 1832 distinguished the Sandwich Island plant and described it as an unnamed var. β of *Ophioglossum pendulum.*

The name-bringing synonym is *Ophioderma pendulum* (L.) Presl var. *falcatum* Presl, Böhm. Gesell., Abh. V, **4**: 315, 1847 (1845). This was published as follows:

"β *falcatum,* fronde breviore rigidiore simplici falcata. . . . in montibus excelsis insularum Sandwich: in Woahu [=Oahu] (Macrae), in Owyhi [=Hawaii Island] (Nelson), in insulae Luzon provincia Tayabas (Cuming pl. philip. exs. n. 91)."

In 1866 John Smith published the next name, *Ophioglossum furcatum* (Ferns Brit. and For., 272, 1866). This was a transfer based solely on the reference *Ophioglossum pendulum* β *furcatum* Presl (Suppl. tent. Pterid. 56, 1845). It was recorded from Queensland. Smith retained this species unchanged through two subsequent editions, then again listed it as a valid species in his Historia Filicum (368, 1875). Clausen (Torrey Bot. Club, Mem. **19**(2): 116) lists Smith's species as a synonym of *O. pendulum* ssp. *typicum.* He explains that the specific name alludes to the furcate apex of the blade. He concludes that "This is simply a trivial form which certainly does not merit nomenclatorial distinction." It should be stated that Smith's species is a later homonym of *Ophioglossum furcatum* Roxb. (1844), so it is an illegitimate name in any case. Also, Smith's name-bringing synonym is erroneous. Presl did not make a var. *furcatum,* rather, on page 56 of the reprint (Suppl. tent. Pterid.), he described as new *Ophioderma pendulum* (L.) Presl β *falcatum* Presl from the Sandwich and Philippine Islands. Clausen did not detect this error in synonymy. Hence *Ophioglossum furcatum* J. Smith should be listed as a synonym of *O. falcatum* (Presl) Fowler. Thus, Smith's plant (but not its name) was not an unworthy, trivial form, but instead a distinct plant which Clausen on the next page accepted as ssp. *falcatum,* and which the writer here accepts as a species. On page 118, Clausen (loc. cit.) gives incorrect page references for the names published by Greville and Hooker, and by Presl.

In 1932 Otto Degener published the new name *Ophioderma falcatum* for the short, falcate, leathery fronded plant of the Hawaiian islands and some other Polynesian islands (Fl. Hawaiiensis, fam. 1, Sept. 10, 1932). Clausen (p. 118) criticizes this publication for its lack of attempt to indicate diagnostic characters from *Ophioglossum pendulum,* and for its failure to cite the name var. *falcatum* Presl (1845). It is obvious that Degener was aware of Presl's publication, for in his synonymy he lists *Ophioderma pendulum* W. J. Robinson (which was only a misidentification) not *Ophioderma pendulum* Presl (Suppl. tent. Pterid. 56, 1845). Degener gives his type locality as "Sandwich Islands. Comprising Oahu, Woahoo, or O-Wahu, and Oneeheow, or Nihow.", then adds in brackets "Undoubtedly Oahu." The source of this quoted type locality is not given. It is not any one of the publications he cites in synonymy. It is undoubtedly quoted material because of the archaic spellings of the island names, and the modern spelling of one given in brackets, but the writer has been unable to determine any single source of these quoted localities.

In 1940 R. L. Fowler made the new combination *Ophioglossum falcatum* (Presl) Fowler (Am. Fern Journ. **30**: 10, 1940). He thus accepts the Hawaiian plant with shorter stiffer fronds as a distinct species. The writer agrees with this treatment, as he had independently reached the same conclusion and planned to make the combination in this paper. The author presents here the facts and the ensuing deductions which justify this conclusion. Fowler gives no explanation or discussion of the reasons why he makes the new specific combination. He cites only references to Presl and Degener. He does not cite the recent monograph by Clausen, though he may have seen it, for, like Clausen, he accepts both *O. falcatum* and *O. pendulum* as growing in the Hawaiian islands. The present writer excludes *O. pendulum* from the Hawaiian islands for reasons just presented in detail.

Ophioglossum falcatum is abundant in the rain forests of the Hawaiian islands. In the original description by Presl it was credited also to Luzon in the Philippine Islands. Clausen records it (as a subspecies) from Guam in Micronesia. Additional records are listed below from specimens seen in the Gray Herbarium.

Fiji: Ovalau, Levuka, 1898, *F. C. Prince*; without locality, 1898 *F. C. Prince.*

New Hebrides: Aneiteum, Feb. 1859, *herb. Thos. Moore.*

Sumatra: Peso Peso, virgin jungle, alt. 4,100-4,500 ft., northwest side of Toba Lake, Feb. 22, 1932, *W. N. and C. M. Bangham 1159*; Habinsaran, mossy jungle, slopes of Dolok Soeroengan, May 18, 1927, *H. H. Bartlett 7975.*

LOBELIACEAE

Rollandia Humboldtiana Gaud. forma **albida** St. John, forma nova.

Illustrations: Rock, J. F., B. P. Bishop Mus., Mem. 7(2): pl. 217, 1919; Degener, O., Fl. Hawaiiensis, fam. 339, Dec. 15, 1932.

Floribus albis.

Differs from the species with which it grows by having the corollas clear white.

Hawaiian islands, Oahu: Manoa, Olympus trail, Sept. 1912, *J. F. Rock,* without no. (type in Bishop Mus.); Mt. Olympus, Sept. 1912, *J. F. Rock and Shaw* (Ca-Gr.); Mt. Olympus, Koolau Mts., plant 3-8 ft. tall, in upper woods, flowers white, Jan. 6, 1932, *H. St. John 11510*; Kipapa Gulch, 2d N. Fork, Koolau Mts., along moist stream bed, el. 1,000 ft., Nov. 13, 1932, *E. Y. Hosaka 829*; Paalaa-Wahiawa ridge, Poamoho Trail, deep moist *Metrosideros* woods, 1,850 ft. alt., Nov. 27, 1938, *H. St. John 19833.*

The species *Rollandia Humboldtiana* was named and illustrated by Gaudichaud (Bot. Voy. Bonite, t. 76, 1839-52). No descriptive text was ever published. It is not possible to tell from the drawing what the color of the flower may have been, and the type specimen is now lost. J. F. Rock apparently did not find it with the other Gaudichaud types in the Paris herbarium. He accepted the species, and it is generally agreed to be valid as published with a name, and figure with analytical details. Rock cites it (B. P. Bishop Mus., Mem. 7(2): 382) as "OAHU: Gaudichaud;" without any further data or discussion, while other type specimens which he certainly saw (such as *R. lanceolata,* loc. cit. 371) he cites as "OAHU: Gaudichaud type in herbarium Museum Paris". In his discussion of *R. Humboldtiana,* Rock refers only to its appearance in the illustration, so the inference seems reasonable that he did not locate any type specimen. Prof. H. Humbert replied to the writer on March 11, 1939 that no type could be found then. No authentic Gaudichaud material

of this species could be found in Kew, Berlin, or Geneva, as the writer is now informed by the directors of the herbaria in those cities.

Delissea racemosa Mann (*Rollandia racemosa* (Mann) Hbd.) is a synonym of *R. Humboldtiana.* The original description does not give the flower color, nor does Hillebrand add it. Examination of an isotype specimen did not reveal the color either in the old specimen or in the inadequate data.

Rollandia pedunculosa Wawra was described from material in fruit only. Hence, it seems logical to leave the dark magenta-flowered plants as the nomenclatorial type, as they are doubtless the biological type. This is accomplished by describing the albino as a new forma. This white-flowered form occurs not infrequently intermingled with the species or replacing it in certain localities. Though its difference (lack of pigment in the perianth) is unimportant, it is strikingly conspicuous and seems worthy of being described as a forma. Its anthers are magenta in color.

From the data on the Rock and Shaw specimen from Mount Olympus, now in the Gray Herbarium, it is apparent that Rock intended at one time to describe the white-flowered plant as a new variety. He labeled it with a manuscript name and marked the label cotype. This manuscript name was never published, and in Rock's monograph published in 1919 he included both the purple- and the white-flowered plants as *R. Humboldtiana.* He records both flower colors in the key (B. P. Bishop Mus., Mem. 7(2) : 108) and in the description (382), so he had decided not to publish his manuscript name for the white-flowered plant or to separate it from the "purplish" (dark magenta)-flowered plants. Hence, the albino form is here described as new, and not attributed in part to Rock.

The varietal name is taken from the Latin adjective, *albidus,* meaning whitish.

GOODENIACEAE

Scaevola mollis Hook. and Arn. forma **trilobata** St. John, forma nova (fig. 1).

A specie differt in foliis latioribus trilobatis.

Differing from the species by having the leaves 3.5-10 cm. wide and prominently 3-lobed. *S. mollis* has the blades simple and 1.2-5 cm. wide.

Hawaiian islands, Oahu: Waikane-Waipio trail, Koolau Mts., height 3 ft., on trail, wet forest, alt. 2,500 ft., May 7, 1939, *T. Kubota* (type in Bishop Mus.).

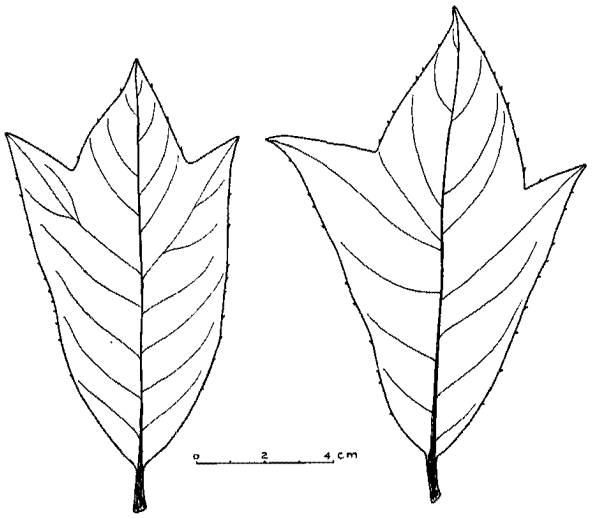

FIGURE 1.—*Scaevola mollis* f. *trilobata* St. John, leaves of the type.

Scaevola mollis is abundant along the wind-swept, humid ridge of the Koolau Range. It is agressive and invades any denuded area, as it has done on many parts of the new summit trail. One bush was found with the leaves all broader than usual and with divergent lobes. It is a variant of *S. mollis* and though its differences, the broader and 3-lobed leaves, are striking, they are not of great taxonomic value. It is appropriate to give this recognition as a form.

The name is from the Greek, *tri*, thrice; *lobos*, lobe, in allusion to the 3-lobed leaves.