

NOTES ON JOINVILLEA

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PLATE 1.—*Joinvillea ascendens* nos. 1-6, and *Joinvillea elegans* nos. 7-26; reproduction of Pl. 39-40, Atlas, "Voyage autour du monde . . . sur *La Bonite*."

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The small genus *Joinvillea*, as known at present, is distributed from the Malay Peninsula to Hawaii. A total of six published species, which have been reduced to three, are known from the Malay Peninsula, Sumatra, Borneo, the Philippines (Palawan only), New Caledonia, Isle of Pines, New Hebrides, Fiji, Samoa, and Hawaii.

The genus was established by Gaudichaud,¹ who published detailed drawings of a fruiting specimen of *Joinvillea elegans* and a sterile specimen of *J. ascendens*. Though no descriptions were published, the generic name is not invalidated, as the illustrations present detailed analyses of *J. elegans*. (See Pl. 1.)

Regarding the locality where the specimens were collected there are likewise no original data, and the explanatory remarks published later by d'Alleizette² unfortunately contain incorrect statements. He gives New Caledonia as the locality for *J. ascendens*, deliberately using the data from specimens of *Flagellaria (Chortodes) plicata* Hooker f., collected after Gaudichaud's publication, making it appear that he never saw the original labels. According to Brongniart and Gris³ the specimens from which the drawings were made are not to be found in the herbarium of the Musée National d'Histoire Naturelle, a fact that I confirmed by a visit there.

The route of *La Bonite*, on which voyage the plants were supposedly collected, runs through the Pacific from Guayaquil directly to Hawaii, where stops were made at Kealakekua Bay and at Kailua on the island of Hawaii, and at Honolulu on Oahu. From there directly to Manila, then to Macao, Tourane, Singapore, Malacca, Pulo Pinang, and Calcutta. Along this route *Joinvillea* has since been collected only in Hawaii and the Malay Peninsula. However, from neither of these places have specimens appeared that correspond to the drawing of *J. elegans*, published by Gaudichaud. Subsequently specimens which probably belong to this species have been collected on

¹ Gaudichaud-Beaupré, C., Voyage autour du monde, . . . sur La Bonite, . . . Histoire naturelle, Botanique, Atlas, Pls. 39, 40, 1846-1849? [The date of publication of the Atlas has been obtained from Ann. Mag. Nat. Hist., 7th ser., vol. 7, p. 391, 1901.]

² Gaudichaud-Beaupré, C., Voyage autour du monde, . . . sur La Bonite, . . . Botanique, vol. 3, Explication et description des planches de l'Atlas par C. d'Alleizette, p. 56, 1866.

³ Brongniart, A., and Gris, A., Note sur le genre *Joinvillea* de Gaudichaud et sur la famille des Flagellariées: Bull. Soc. Bot. France, vol. 8, p. 265, 1861.

the Isle of Pines and New Caledonia proper, far off the track of *La Bonite*.

In Hawaii, *Joinvillea* has been collected on all the big islands (Hawaii, Maui, Molokai, Oahu, Kauai), and more numerous collections exist for this area than for any other. The material is very uniform and is different from *J. elegans*, so that it may reasonably be doubted that Gaudichaud collected this species here. Besides, all the new species discovered by Gaudichaud on the *La Bonite* voyage have since been rediscovered (perhaps with the exception of one of the Pritchardias).

Regarding *Joinvillea ascendens*, the other plant pictured by Gaudichaud still less certainty exists, as the drawing ("Pl. 39 et 40. 1 à 6") represents only a sterile shoot with young leaves. It differs from the drawing of *J. elegans* in its longer ligules and its smooth ribs on the lower leaf surface. Both surfaces have scabrous ribs in *J. elegans*.

Brongniart and Gris⁴ referred plants collected by Remy on Kauai (Remy No. 156 A; the locality given on the original label is "Kauai ou Nihau [Niihau]") to *J. ascendens* Gaudichaud, though specimens in Remy's collection from Hawaii, Maui, Molokai, and Oahu were referred to a new species, *J. gaudichaudiana*⁵ Brongniart et Gris. The basis for referring the Kauai specimens to *J. ascendens* seems to me very weak. Gaudichaud's drawing of the sterile shoot with three juvenile leaves offers, as far as I can see, no characters for specific determination. From an examination of the material in most of the larger herbariums, with a view to a revision of the genus, it appears that the leaf blades of all species are very much alike, and useless in the distinction of species. But even so, the leaf blade of Remy's specimen has scabrous ribs below, disagreeing in the only point of difference in the blade between *J. ascendens* and *J. elegans* as pictured.

A character of possible specific significance is the long ligule. But this is variable, at least in the Hawaiian plants, a variation of from 4 to 31 mm. in length having been observed in specimens of the same collection number. And again, Remy's specimen has short ligules. Specimens of *Joinvillea* from the Malay Peninsula may with

⁴ Brongniart, A. and Gris, A., Note sur le genre *Joinvillea* de Gaudichaud et sur la famille des Flagellariées: Bull. Soc. Bot. France, vol. 8, p. 269, 1861.

⁵ At the request of the author, attention is called to the fact that in the capitalization of generic and specific names Bishop Museum follows the procedure of the United States Government Printing Office.

equal justification be referred to *J. ascendens* Gaudichaud, coming just as close in characters of the leaf.

And then comes the fact that the original specimens are lost, no locality is known, and the other species published on the same plate has not been rediscovered in Hawaii or any of the other places where the *La Bonite* expedition touched.

All later authors have followed Brongniart and Gris in attributing *J. ascendens* Gaudichaud to Hawaii. But they have disregarded *J. gaudichaudiana* Brongniart et Gris, extending the range of *J. ascendens* to cover not only Kauai, but also the other Hawaiian islands.

The opposite procedure seems, however, to be the better one. As presented in Gaudichaud's drawing, the species *J. ascendens* is altogether too vaguely characterized. As no analysis accompanies the illustration, the species should be rejected according to the International Rules (articles 37 and 51, 4). An examination of Remy's specimens in Musée National d'Histoire Naturelle, and a large number of specimens in Bernice P. Bishop Museum, shows no justification for the separation of two species. The stated difference in the shape of the leaf is based partly on the upper young leaves, and does not hold good in the light of the more ample material now available. Furthermore, the filiform acumen of the outer tepals, supposed to be characteristic of *J. gaudichaudiana*, is present also in specimens from Kauai, but is as a rule broken off with age, which may explain its absence from Remy's specimen, which is in ripe fruit. The inner tepals are not always mucronulate, partly for the same reason. The supposed difference in the starch granules I have not been able to verify. *J. gaudichaudiana* Brongniart et Gris is, therefore, the proper name to be applied, and should be extended to include also the specimens from Kauai.

Joinvillea gaudichaudiana Brongniart et Gris, emendavit.

Joinvillea gaudichaudiana Brongniart et Gris: Bull. Soc. Bot. France, vol. 8, p. 269, 1861.—Ann. Sci. Nat. Bot., 5th ser., vol. 1, p. 337, 1864.

Joinvillea ascendens Gaudichaud, Brongniart et Gris: Bull. Soc. Bot. France, vol. 8, p. 269, 1861.—Ann. Sci. Nat. Bot., 5th ser., vol. 1, p. 337, 1864.

Joinvillea ascendens Gaudichaud, Wawra: Flora, vol. 58, p. 248, 1875.

Joinvillea adscendens Gaudichaud, Hillebrand: Flora of the Hawaiian islands, p. 447, 1888.

Plants erect, to 4 (5) meters high, growing in clumps in the manner of bamboo. Stem unbranched, terete, hollow except at the nodes, smooth, glabrous, reaching a diameter of 2 cm. at the base, in the lower part of some specimens split within the sheaths, internodes 4-9 cm. long in the upper part, increasing

in length downwards. Sheaths long, covering the internodes, open, contracted at the base of the leaf blade, with a narrow scarious margin, striped, smooth, or slightly scabrous, shortly pubescent, becoming glabrous with age. Ligule bilobed, lobes with a scarious margin, variable in length and form, usually ligulate, rounded at the apex, 3-31 mm. long. Leaf blade linear—lanceolate from a constricted base, slightly concave, more or less gradually attenuately acuminate, plicate, 9-13 folds on each side of the midrib, scabrous on the prominent ribs of both surfaces, hairy below, the hairs appressed or ascending, wavy, often bunched, glabrous above, at maturity 50-60 cm. long, 8-10 cm. broad when flattened out. Inflorescence an erect open terminal panicle, pyramidal, 15-20 cm. long, 15-25 cm. broad, main axis and branches densely tomentose with short woolly hairs, primary branches 15-24, bracts short, triangular or shortly acuminate, bracteoles triangular or shortly acuminate, 1 mm. or less long, or attenuate acuminate, 2-4 mm. long. Flowers sessile along the branchlets. Perianth of two rows, outer tepals 3, oval, keeled, obtuse to acute, saccate at base, only one distinct vein running out in a reflexed mucro, towards the apex with a broad scarious margin, 2.5-3 mm. long, 1.5-2 mm. broad when flattened out, inner tepals 3, broadly oval, concave, obtuse, distinctly 3-veined, the veins converging below the apex, rarely mucronulate, with a broad scarious margin above, 2.5-3.5 mm. long, 2-2.5 mm. broad when flattened out. Stamens 6, anthers sagittate, linear, obtuse, 2 mm. long on short filaments. Stigmas 3, plumose, exserted. Fruit globose, shining, orange-yellow, with a fragile epicarp, 4-5 mm. in diameter. Seeds 3 (or fewer by abortion), dark-red, rugulose, filled with starch. Embryo minute, lenticular.

Differs from *J. elegans* Gaudichaud primarily in the shape and relative size of the tepals.

Hawaiian islands specimens examined are as follows:

Hawaii: Remy no. 156 (Paris, Gray Herbarium); Hillebrand and Lydgate (Bishop Mus.).

Maui: Remy no. 156 (Paris); Rock, Nov. 18, 1908 (Bishop Mus.); Rock, May, 1911 (Bishop Mus., Gray Herbarium); Forbes nos. 245 M., 490 M., 1641 M. (Bishop Mus.); Munro no. 664 (Bishop Museum.).

Molokai: Remy no. 156 (type, Paris); Rock, March, 1909 (Bishop Mus., Gray Herbarium); Forbes no. 285 M. (Bishop Mus.); Munro no. 697 (Bishop Mus.); Krajina, March 23, 1930 (Bishop Mus.).

Oahu: Macrae, May, 1825 (Kew Herbarium); Macrae, June, 1825 (Gray Herbarium); Remy no. 156 (Paris); Guppy in 1807 (Kew Herbarium); Forbes nos. 1711 O., 2205 O. (Bishop Mus.); Topping no. 3133 (Univ. California, Buitenzorg); St. John nos. 10109, 10177 (Bishop Mus.); Christophersen no. 1286 (Bishop Mus.).

Kauai: "Kauai ou Nihau [Niihau]" Remy no. 156 A (Paris);

Mann and Brigham no. 330 (British Mus., Gray Herbarium) ; Forbes nos. 42 K., 564 K., 623 K. (Bishop Mus.).

Hawaiian islands: Hillebrand (British Mus.).

In the Musée National d'Histoire Naturelle, the specimen from Molokai and one of those from Hawaii in Remy's collection are labeled *Joinvillea gaudichaudiana* Brongniart et Gris, in Brongniart's handwriting. Both specimens correspond to the original description, but the perianths of the one from Molokai are better preserved, as the specimen is in young fruit only, and is perhaps best suited to represent the type. The other specimens in Musée National originally cited as *Joinvillea gaudichaudiana* Brongniart et Gris (Maui, Oahu, both Remy no. 156) are labeled *Joinvillea ascendens* Gaudichaud with a question mark.