

PLATE X.

- Fig. 1. *VRIESIA SPARSIFLORA* L. B. Smith (*F. C. Hoehne in Inst. Biol. S. P. 17982*), habit $\times \frac{1}{4}$.
 Fig. 2. Same, petal and stamens $\times 1$.
 " 3. *QUESNELIA HOEHNEI* L. B. Smith (*L. B. Smith 1968*), habit $\times \frac{1}{4}$.
 " 4. Same, flower $\times 1$.
 " 5. Same, petal and stamens $\times 1$.
 " 6. *GLOMEROPITCAIRNIA ERECTIFLORA* Mez (*W. E. Broadway*), flower and floral bract $\times 1$.
 Fig. 7. Same, petal and stamen $\times 1$.

PLATE XI.

- Fig. 1. *RONNBERGIA MARANTOIDES* L. B. Smith (*H. M. Curran 142*), habit $\times \frac{1}{4}$.
 Fig. 2. Same, flower $\times 1$.
 " 3. Same, petal and stamen $\times 2$.
 " 4. *STREPTOCALYX LANATUS* L. B. Smith (*H. M. Curran 138*), branch of panicle $\times 1$.
 Fig. 5. Same, sepals $\times 2$.
 " 6. *ARAEOCOCCUS PECTINATUS* L. B. Smith (*C. H. Lankester 1164*), section of the inflorescence $\times 1$.
 Fig. 7. *STREPTOCALYX CURRANII* L. B. Smith (*H. M. Curran 143*), branch of panicle $\times 1$.
 Fig. 8. Same, sepal $\times 2$.
 " 9. Same, petal and stamens $\times 2$.

V. THE GROUP OF *ASPLENIUM FRAGILE* IN SOUTH AMERICA.

BY C. A. WEATHERBY.

The group of *Asplenium fragile* consists, in South America, of three closely related and critical species. All three share the characters of habit, large number of pinnae, glandularity of frond, proliferation of the lower axils, and blackish-reticulate spores.¹ Probably in all, and almost certainly in the material of *A. fragile*, var. *lomense* studied, the stipes of the proliferous fronds frequently become greatly elongated, with the lamina poorly developed, or lacking altogether. After the lamina, or what there is of it, has withered, the stipe remains, apparently living, until the young plant which develops

¹ One can easily be misled as to the character of the spores in herbarium specimens. Apparently, in drying, sporangia which were still closed when collected open and release spores nearly but not quite matured, which have attained their full size but are quite different in appearance from the fully ripe spores. They are brownish in color and the anastomosing ridges, instead of being thick, black, and opaque, are thin and translucent, giving the effect of a winged spore when seen in profile—an effect which quite disappears when the spore is completely ripe.

from the gemma at its summit has become well rooted, giving quite the appearance of a flagelliform stolon.

Since the three species have been confused in herbaria, the following attempt to define them and the citation of specimens belonging to them, may be of service. I am much indebted to the authorities of the United States National Museum for the loan of specimens, and to those of the Royal Botanic Garden, Kew, for fragments of the type of *Asplenium Gilliesii*. These fragments, and photographs, in the Gray Herbarium, of the two plants cited by Hieronymus in the original publication of *A. Lorentzii*, have been used, in addition to the descriptions, in determining the application of the two names concerned. *A. fragile* is employed in the usually accepted sense, for the plant which seems most nearly to agree with Presl's description and figure.

- Margins of the broadly flabelliform-rhombic, pale green and (when mature) rather thick pinnae dentate with sharply acute or acuminate teeth; median cells of the scales elongate-oblong or linear-oblong, generally with small lumina; spores nearly spherical, 40–50 μ in diameter. 1. *A. Gilliesii*.
- Margins of pinnae entire, crenate, or with mostly blunt, short-mucronate teeth; median cells of the scales broadly oblong to square, usually with conspicuous lumina; spores chiefly ellipsoid, 30–50 \times 20–25 μ .
- Pinnae trapezoid-ovate or trapezoid-oblong, not at all or only slightly auriculate or lobed in well-developed fronds, membranaceous, deep green, truncate at the very inequilateral base, the lower margin nearly straight and entire almost to the obtuse or truncate apex, the upper margin dentate with mostly blunt teeth. 2. *A. Lorentzii*.
- Pinnae flabelliform-rhombic, in well developed fronds commonly auriculate or shallowly or sometimes deeply bi-lobed.
- Stipe and rachis beneath merely fuscous; pinnae pale green and somewhat coriaceous, their margins or those of their lobes crenate-dentate. 3. *A. fragile*.
- Stipe and rachis brown; pinnae bright green and rather thin, their margins or those of their lobes entire.
- 3a. *A. fragile*, var. *lomense*.

1. ASPLENIUM GILLIESII Hook. Exot. Fl. ad t. 208 (1827). *A. Gilliesianum* Hook. & Grev. Icon. Fil. t. 73 (1829). *A. debile* Fée 10 Mém. 28, t. 35, f. 2 (1865) (see Christensen Ark. Bot. xx, pt. 7. 14 (1926)).—PERU: Chicla, April 21–23, 1882, Ball (G); Oroya, July 14, 1914, Rose, no. 18,702 (U. S.); Ollantaytambo, 3000 m., April 26, 1915, Cook & Gilbert, nos. 340 and 342 (U. S.); among volcanic rocks near Tinta, 3500 m., April 15, 1915, Cook & Gilbert, no. 207 (U. S.); Tarata, Espinosa (G.). BOLIVIA: La Paz, 11,500 ft., Aug. 22, 1901, R. S. Williams, no. 2596 (mixed with *A. fragile*; U. S.); 1884,

Bang, no. 121 (G., U. S.); Jan. 25, 1906, *Buchtien*, no. 165 (U. S.); Pozna, 4200 m., May, 1908, *Buchtien*, no. 1138 (U. S.); Comancha, *Rose*, no. 18,878 (U. S.); Sorata, 7500 ft., Sept. 3, 1901, *R. S. Williams*, no. 2597 (U. S.).

Hooker and Greville describe this species as with "frondibus tenuissime membranaceis" and with oval spores. The discrepancy between their statements and the character here given for the species may perhaps be explained by the fact that the type material (so far, at least, as evidenced by the fragment seen by me) is young and has immature spores. Ball (*Journ. Linn. Soc.* xxii. 64 (1885)) and Christensen (*Ark. Bot.* xx, pt. 7. 14 (1926)) have pointed out that the characters of *A. Gilliesii* are not altogether constant and that forms seemingly intermediate between it and *A. fragile* are found. However, it is usually rather readily distinguishable by the ear-marks enumerated in the key and seems quite worth maintaining—as is done by both the authors referred to.

2. ASPLENIUM LORENTZII Hieron. *Engl. Bot. Jahrb.* xxii. 375 (1896).—BOLIVIA: Im Walde, Unduavi, Nord-Yungas, 3300 m., *Buchtien*, nos. 408 (G.), 901 and 2642 (U. S.); Oct., 1885, *Rusby*, no. 405 (G.); Pinos bei Tarija, 2300 m., March 12, 1904, *Fiebrig*, no. 2974 (U. S.), in part.

A. Lorentzii appears to vary toward *A. Gilliesii*, but differs from that species in the structure of its scales and the shape of its spores, and from both *A. Gilliesii* and *A. fragile* in the texture and shape of its pinnae, which, as Hieronymus remarks, resemble, when well developed, those of small specimens of the group of *A. lunulatum*. On these characters it is here kept up.

3. ASPLENIUM FRAGILE Presl, *Tent. Pterid.* 108 (1836). "*A. stoloniferum* Bory" Presl, *Rel. Haenk.* i. 44, t. 6, f. 4 (1825), not Bory (1804). *A. rhomboideum* Brack. *Wilkes Expl. Exp.* xvi. 156, t. 2, f. 2 (1854).—VENEZUELA: Páramo de Timoteo, Mérida, 3000 m., Jan. 21, 1922, *Jahn*, no. 865 (U. S.). COLOMBIA: without locality, *Moritz*, no. 326 (G.). ECUADOR: Cuenca, Sept. 16, 1918, *Rose & Rose*, no. 22,734 (U. S.); Sept. 17–24, 1918, *Rose, Pachano & Rose*, no. 22,839 (G., U. S.); in dumetis Cotocallas, *Mille*, no. 109 (fronds 3.5 dm. tall; G., U. S.); ravines at Chuquipollo, Dec. 8, 1855, *Couthouy*, no. 45 (G.). PERU: Panticalla Pass, 3000 m., July 14 and 17, 1915, *Cook & Gilbert* nos. 1825 and 1885 (U. S.); La Quinoa, 12,000 ft., May 14, 1922, *Macbride & Featherstone*, no. 2025 (U. S.); [Baños] *Wilkes Expl.*, no. 44 (type or cotype of *A. rhomboideum* Brack. U. S.); on wall of reforested terrace, Ollantaytambo, 3000 m., May 11, 1915, *Cook & Gilbert*, no. 661 (U. S.). BOLIVIA: Sorata, 10,000 ft.,

Feb., 1886, *Rusby*, no. 404 (G., U. S.); Pelichuco, 10,000 ft., May 1, 1902, *R. S. Williams*, no. 2595 (U. S.).

I cannot understand what is meant by *A. fragile*, var. *stoloniferum* Rosenst. Meddel. Rijks Herb. Leyden no. 19, 11 (1913), said to be based on *A. stoloniferum* Presl. There is properly no *A. stoloniferum* Presl; that author, in the *Reliquiae Haenkeanae*, misapplied the name *A. stoloniferum* Bory to the plant which, recognizing his error, he later called *A. fragile*.

Dr. Winifred Robinson (Bull. Torr. Bot. Club xl. 209 (1913)) makes the surprising statement that the type locality of *A. rhomboideum* Brack. is the Hawaiian Islands. It is, of course, actually Baños, Peru, and no other collection is cited by Brackenridge. The identity of his plant is quite clear from his excellent figure and the Wilkes Expedition specimen in the National Herbarium. The Hawaiian plant in question (which is closely related to, but hardly conspecific with, the Andean) he seems to have referred to *A. Menziesii* Hook. Mettenius, Hooker, and Christensen were quite correct in referring *A. rhomboideum* to *A. fragile*. I cannot separate the two even varietally and believe that Hooker was right in supposing that Presl had described a dwarfed and Brackenridge a more luxuriant phase of the same species.

ASPLENIUM FRAGILE Presl, var. LOMENSE Weatherby, Contr. Gray Herb. lxxxv. 13 (1929).—CHILE: under rock in bottom of gulch above springs, in moist and sheltered situation, Aguada del Panul, Prov. Antofagasta, Dept. Taltal, Dec. 4, 1925, *Johnston*, no. 5421 (G.).

Asplenium peruvianum Desv. Mém. Soc. Linnéenne Paris vi. 271 (1827) was assigned to this group by Mettenius, probably correctly, but I cannot be sure of its identity. Desvaux's description is very brief and not very helpful. A photograph, in the Gray Herbarium, of his type specimen at the Paris Museum, shows a single small and seemingly depauperate frond, broken in the middle and at the tip, and bearing seven pairs of pinnae. The better developed of these exhibit a strong tendency toward the quadrilateral outline characteristic of *A. Lorentzii*, but are more coarsely toothed and more auriculate than in that species. Desvaux's binomial, based, as it is, on material insufficient in a critical group, had best remain in the limbo of *species dubiae*, at least until someone thoroughly familiar with the points involved can examine the actual type. With it may rest *A. tenue* Presl Rel. Haenk. i. 44, t. 6, f. 5 (1825), if, indeed, it is of this affinity.



Weatherby, Charles Alfred. 1931. "The group of *Asplenium fragile* in South America." *Contributions from the Gray Herbarium of Harvard University* (95), 49–52. <https://doi.org/10.5962/p.336139>.

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