

THE RELATIONSHIP OF ASPLENIUM ANDREWSII.

By WILLIAM R. MAXON.

In the final brochure¹ of the Proceedings of the Biological Society of Washington for 1904, volume 17, Prof. Aven Nelson published, as one of several undescribed species collected in Colorado by Mr. D. M. Andrews, a supposed new *Asplenium*, which he dedicated to its discoverer as *Asplenium andrewsii*.² The description and notes are as follows:

“Rootstock short, wholly enveloped in matted roots; stipes naked, ebeneous below, becoming green above, from 2–10 cm. long, somewhat angled or striate; lamina thinly herbaceous, deltoid-ovate or narrower, 3–10 cm. long, somewhat narrower at its widest part, bipinnatifid, diminishing nearly uniformly from base to tip; pinnæ lanceolate, the lower nearly at right angles to the rachis, the upper ascending, gradually diminishing and passing into the pinnatifid tip, all rather closely approximate and subopposite or the lower more distant (1 cm. or more) and alternate; pinnules 3–12 mm. long, ovate, more or less cuneate at base, sharply incised but cut not quite to the costa, sharply and somewhat incisely serrate; the veins rather inconspicuous and but slightly divergent; sori short but nearly connecting to those in the successive lobes, so forming almost a continuous sorus from base to apex of pinnule; indusium straight, forced back and finally concealed by the sporangia.

“Perhaps most nearly allied to *A. bradleyi* D. C. Eaton, but probably not very closely even to this. Mr. Andrews writes of it as follows: ‘The most interesting item on the list to me. I am sending a better specimen. It is certainly indigenous and grows on the south face of a white sandstone (alkaline) cliff extending along Boulder Creek for a mile or more, the ferns growing in crevices abundantly for nearly the whole distance. It is growing with *Cheilanthes feei*, a specimen of which I send you. The sandstone is porous and is not entirely dry.’”

Not long after this Professor Underwood called my attention to the obviously close relationship of this form to the Old World *Asplenium adiantum-nigrum*, and, if I am not mistaken, to the great difficulty or impossibility of distinguishing it specifically from that species, as usually accepted by European botanists. In 1906, however, the species was recognized by him as valid in Rydberg’s *Flora of Colorado*, and again in his article “American Ferns, VI—Species added to the flora of the United States from 1900 to 1905,”³ here with the comment, “This new discovery from Colorado is a member of the *adiantum-nigrum* group of *Asplenium*, and is closely related to *Asplenium adiantum-nigrum* of central and southern Europe. Among our

¹ Issued December 27, 1904.

³ Bull. Torrey Club 33: 193. 1906.

² Page 174.

species it will stand nearest to *A. montanum*." From which it may be noted that Doctor Underwood was not only unwilling, apparently, to ascribe to *A. adiantum-nigrum* itself an extra-European range (though the species is usually accredited also to various parts of Africa, and to the Himalayas, Asia Minor, and other parts of Asia), but that also, in accordance with his often-expressed views as to the relatively restricted range of fern species, he was inclined upon *a priori* grounds to look upon the American plant as specifically distinct from that of the Old World. That *A. adiantum-nigrum* as ordinarily accepted does occur in Africa and Asia is apparent from specimens at hand; and if we admit the various forms distinguished by Milde,¹ Luerrsen,² Christ,³ and others as constituting but a single highly variable species, there seems to be no logical ground for regarding *A. andrewsii* as other than a geographical phase of *A. adiantum-nigrum*. Excepting only *Athyrium filix-foemina*, there is, probably, no fern occurring in the United States which closely approaches it in extent of variation.

The two illustrations (Pls. 1 and 2) herewith represent at natural size the type specimens of *Asplenium andrewsii*, which have courteously been lent from the Rocky Mountain Herbarium, University of Wyoming, by Professor Aven Nelson. In general shape the lamina is apparently unusual for *A. adiantum-nigrum* in its relatively great width. Most of the foreign material at hand most closely resembling this shows blades elongate-deltoid in form, the upper portion often attenuate,—a leaf shape more nearly approached by some of the smaller fronds here shown. In fact not one frond of the foreign material available for comparison has precisely the same leaf shape as that of *A. andrewsii*, the nearest approach being in specimens from Doullens, France, *Copineau*, July 12, 1887, and from Devonshire, England, *Ware*, July 15, 1904. These appear to represent the variety *argutum*, as described by Luerrsen. Lacking a first-hand knowledge of *A. adiantum-nigrum* as it occurs in Europe, I hesitate to refer to it without reservation this American form, which is known only from such meager material; but I believe that the highly complex "species" *A. adiantum-nigrum*, as generally understood at present, embraces among its various and varying forms several elements which, in their extreme states, differ more widely from each other than from *A. andrewsii*. In degree of dissection, leaf texture, color of leaf tissue and of vascular parts, shape of pinnæ, extent and character of sori, and in more minute characters, such as the peculiar form and structure of the long, slender, hair-pointed scales of the rhizome, the American plant certainly agrees very closely with some

¹ Milde, Fil. Eur. Atlant. 85. 1867.

² Luerrsen, Die Farnpflanzen 260. 1889.

³ Christ, Die Farnkräuter der Schweiz 68. 1900.



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of the European material, especially with the Devonshire specimen cited. The differences consist principally in its more broadly deltoid fronds and perhaps in its shorter stipe; the stipes of the two large fronds of the type, however, are incomplete, and one of the fronds is seen to be malformed. Through the generosity of Professor Nelson one of the smaller fronds of the type has been presented to the National Herbarium.

The collecting of more adequate material of *A. andrewsii* at the type locality, which is, I believe, not very readily accessible, would be of the greatest interest as throwing light upon the extent of variation in the American plant and its relationship to the Old World forms; and it is hoped that the publication of illustrations of the type specimens (Pls. 1 and 2) may assist in calling to the attention of collectors in the Rocky Mountain region the main characters of a plant which has remained so little known since the time of its description. The original locality has, indeed, been revisited by Prof. E. Bethel, who collected further specimens. Of these a small plant has recently been figured in the Fern Bulletin, with notes by Mr. Clute.¹

A somewhat similar instance of distribution among the ferns is that of *Asplenium septentrionale*, a species which is common in Europe, occurs in the Caucasus, the Himalayas, and Tibet, and in North America ranges from the Black Hills of South Dakota (*Rydberg* 1194) to New Mexico (several collectors), Arizona (*MacDougal* 68), Colorado (several collectors), and Wyoming (*A. Nelson* 8900), and is known even from the San Pedro Martir Range of Lower California (*Brandege*, May 18, 1893). Specimens from all these localities are in the National Herbarium.

¹ Fern Bull. 19: 3. *Frontis*. 1911.