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Notes on American Ferns—XVII. ¹

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WOODSIA SCOPULINA D. C. Eaton. In Rydberg's Flora of the Rocky Mountains (1917), this species is reported from the Great Craggy Mountains, North Carolina. This fact was overlooked by the writer in 1919² when reporting *W. scopulina* from the vicinity of Old Sweet, West Virginia, a supposed new record for the eastern United States. The basis of the North Carolina record is material in the herbarium of the New York Botanical Garden collected "in the sun, upon a cliff of the Great Craggy Mountains, Buncombe County, North Carolina, at an elevation of about 5,000 feet," and sent by James H. Ferriss to Prof. L. M. Underwood in September, 1901. This material, as shown by a portion deposited in the National Herbarium, is quite typical. Aside from these two outlying southern stations the known range of this species is as follows: Alaska (two localities) to Quebec (Gaspé County), Ontario, South Dakota, Colorado, and Utah (ascending to 3,300 meters), and in the Sierra Nevada sparingly to Tulare County, California.

EQUISETUM VARIEGATUM Schleich. In their recent Flora of the Northwest Coast, 1915, Piper and Beattie in referring to the occurrence of *E. variegatum* in Washington suggest the probability of its occurrence farther

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² Amer. Fern Journ. 9: 2. 1919.

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south. The prediction is borne out by a single specimen, hitherto undetermined, in the National Herbarium. This was collected on the sandy bank of the Minam River, Oregon, at a point near its mouth, altitude 850 meters, August 13, 1897, by E. P. Sheldon (no. 8689, in part). It belongs to that form of the species described by A. A. Eaton as var. *alaskanum*.

LYCOPODIUM OBSCURUM L. This species was recently reported by Piper and Beattie³ from a single locality in Washington, 23 miles northeast of the small town of Snoqualmie, upon material collected by L. A. Nelson in 1909. The record is substantiated by a specimen in the National Herbarium. Mr. Nelson's notes indicate that only the single small station in central Washington is known, this having been discovered by him in 1907. The plants are said to grow under small fir, cedar, and hemlocks, at about 2,800 feet altitude.

SELAGINELLA RIDDELLII Van Eseltine. Following the original description of this species the range is given as "Central and eastern Texas, probably through southern Louisiana." Numerous specimens are cited from Texas, but none from Louisiana. There is, however, a reference to Riddell's manuscript description in the Gray Herbarium. Riddell's descriptive notes, which have recently been examined by the writer, give definite distributional data which it seems worth while to put on record. They conclude with the following statement: "On dry sandy hills near Kisatchy Springs, Western La., Hale. Also on dry granular quartz rocks, at Kaolin Creek, near the San Saba, Texas, where I first found it in November, 1839. The foregoing description is drawn from the Texas specimens, as my sample from Dr. Hale, though doubtless the same, is not

³ Fl. Northw. Coast 14. 1915.

in fruit." There are two different collections of this species by Hale in the Gray Herbarium; one is marked merely "Louisiana, *Hale*"; the other is labelled "Sandy hills, Red River, Louisiana, *J. Hale*." Both are fertile, the latter conspicuously so.

SELAGINELLA NEOMEXICANA Maxon. This species when described¹ was known to the writer only upon specimens collected several times in the Organ Mountains, New Mexico, by E. O. Wooton. The range is considerably extended by a specimen in the Gray Herbarium, collected at Paradise, Cochise County, Arizona, March, 1904, by James H. Ferriss. This, like the New Mexican specimens, appears to bear no mature megaspores.

SELAGINELLA OREGANA D. C. Eaton. Underwood, in his initial work on the group of *Selaginella rupestris* in 1898, took up for the Pacific coast plant generally known as *S. oregana* D. C. Eaton the name *S. struthioides*, remarking upon previous failures to associate the description of *Lycopodium struthioides* Presl (from Nootka Sound) with *Selaginella oregana*. A recent study of Presl's description, however, indicates rather clearly that Presl was here describing a true *Lycopodium* and that those writers who have referred the name to forms included in the tropical American complex of *Lycopodium taxifolium* Swartz are probably correct, the locality "Nootka Sund" being erroneous and presumably due to crossed labels.

It may be admitted that the name "*struthioides*" is peculiarly appropriate to our west coast *Selaginella*, in which the numerous slender branches are recurved, like ostrich plumes, in loosely intricate clusters. On the other hand, Presl, however radical his ideas as to multiplying genera, habitually described his plants with

¹ Smiths. Misc. Coll. 72⁵; 2. pl. 1. 1920.

great exactness; and beyond the name itself there is nothing in his description to indicate distinctively the plant since called *Selaginella oregana*. He describes the leaves as 3 lines (6 mm.) long and $\frac{2}{3}$ of a line (1.3 mm.) broad, and as glaucous-green. In *S. oregana* the leaves are 2.35 to 3.35 mm. long and never exceed 0.62 mm. in width, the dimensions being thus about half those given for *Lycopodium struthioides*; they are besides of a peculiarly bright green color, without any trace of glaucous covering. Moreover, Presl placed *L. struthioides* among the true Lycopodiums and compared it with *L. passerinoides* (a form of *L. taxifolium*), which in itself is almost sufficient evidence that he was not dealing with a *Selaginella*.

Under the circumstances, and at least until Presl's type can be examined, it seems best to restore Eaton's name. The type of *S. oregana* is from Port Orford, Oregon. The synonymy is given below.⁵ The range of this species embraces the humid coastal belt from western Washington (Chehalis and Thurston counties) southward to Humboldt County, California. The plants are notably lax and, though occasionally found on the moist litter of forested banks, usually hang from the mossy trunks and branches of forest trees, attaining a length of 60 or even 90 cm. The leaves differ from those of most other United States species of *Selaginella* in being long-decurrent (up to 1 mm.).

Selaginella scopulorum Maxon, sp. nov. Stems prostrate, short-creeping, 3-6 cm. long, pinnately branched, subcespitose, forming large mats; branches numerous, close, the sterile ones mostly 0.5-1.5 cm. long, ascending, simple or with several very short, oblique divisions. Leaves appressed-imbricate (those on the under side largest), chartaceous, subglaucous, linear to lance-subulate, narrowed to an obtusish apex, 2.35-3.25 mm.

⁵ SELAGINELLA OREGANA D. C. Eaton in S. Wats. Bot. Calif. 2: 350. 1880. *Selaginella struthioides* Underw. Bull. Torrey Club 25: 132. 1898. Not *Lycopodium struthioides* Presl, Rel. Haenk. 1: 82. 1830.

long (seta included), 0.3–0.6 mm. broad; seta 0.3–0.6 mm. long, stiff, scabrous, whitish-hyaline from a long lutescent base; cilia 4–8 (11) on each side, 0.06–0.12 mm. long, mostly oblique and incurved. Spikes numerous, 1–2.5 cm. long, slender, suberect; sporophylls coriaceous, deeply concave, broadly ovate, long-acuminate, mostly 2.2–2.8 mm. long (seta included), 1–1.3 mm. broad; seta 0.3–0.55 mm. long, subentire, pungent, whitish-hyaline from a long lutescent base; cilia usually 8–15 on each side, stout, 0.04–0.06 mm. long, the upper ones dentiform; megaspores subglobose, yellow, about 0.4 mm. thick, foveolate-reticulate; microspores orange, about 0.047 mm. thick.

Type in the U. S. National Herbarium, no. 1,028,641, collected in the vicinity of Cracker Lake, Glacier National Park, Montana, altitude 1,740 to 1,920 meters, on moss-covered rocks, July 15, 1919, by Paul C. Standley (no. 15732). Other material referred to this species is as follows:

MONTANA: Numerous localities in Glacier National Park, at 1,350 to 2,600 meters elevation, on exposed rocks, rocky banks, and talus slopes, and in dry or moist meadows, *Standley* 15318a, 15598, 16216, 16255, 16288, 16378, 17055, 17164a, 17979, 18050, 18185; *Ulke*; *Umbach* 856.

WASHINGTON: Mica Peak, Spokane County, *Suksdorf* 8834. Mount Olympus, *Flett* 3092.

OREGON: Sumpter Valley watershed, Blue Mountains, alt. 2,280 meters, *Ferris & Duthie* 941.

WYOMING: Upper Falls of the Yellowstone, *Mearns* 4274. Mouth of Buffalo River, *Merrill & Wilcox* 1218. Middle Ten Sleep Creek, Big Horn County, *Goodding* 483.

BRITISH COLUMBIA: Carbonate, alt. 810 meters, *Heacock* 235. Mount Copperstain, alt. 2,400 meters, *Shaw* 398. Above Revelstoke, alt. 1,290 meters, *Shaw* 902. Goldstream, alt. 660 meters, *Shaw* 1060.

Of the British Columbia and Wyoming material above cited duplicates of *Goodding* 483, *Merrill & Wilcox* 1218, *Shaw* 902, and *Shaw* 1060 were determined as *S. densa* Rydb. by Hieronymus, while *Shaw* 398 and *Heacock* 235 were called by him *S. columbiana* A. A. Eaton, this

apparently an unpublished species name.⁶ *Selaginella densa* (of which *S. Haydeni* Hieron. and *S. Bourgeauii* Hieron. are undoubted synonyms) is clearly the nearest ally of *S. scopulorum* and agrees with it closely in habit. But *S. densa*, at least as found in the northern region of the Dakotas, Montana, and Wyoming, is a plant readily recognized by the conspicuous tufts of very long, slender, white, subpilose-serrulate bristles at the ends of the branches. In *S. scopulorum* the terminal awns are not only shorter, stiffer, and more nearly straight, but are whitish-hyaline from a plainly lutescent base, and they are never aggregated in tufts, as in *S. densa*. The blades of the foliage leaves are different in the two species also; those of *S. densa* are obtuse and terminate abruptly in a long filiform bristle, while those of *S. scopulorum* are less obtuse, tapering slightly to the awn proper through a thick, distinctly lutescent awn-base. The sporophylls of *S. densa*, moreover, are conspicuously long-ciliate, with oblique hairs; in *S. scopulorum* the sporophyll cilia are very much shorter and less oblique.

In the territory from Wyoming southward to New Mexico there occurs a puzzling series of plants, usually referred to *S. densa*, which need the most critical study. A part of this material is probably referable to *S. Engelmanni* Hieron.,⁷ which may have to be taken up as a subspecies of *S. densa*. With the accumulation of more ample material the writer hopes to be able to discuss *S. densa* and related forms in a later paper, including their relationship to typical *S. rupestris*.

Selaginella scopulorum is the plant listed by Standley,⁸ upon the writer's identification, as *A. montanensis*

⁶ Not to be confused with *S. rupestris columbiana* Jones (Bull. Univ. Montana, Biolog. Ser., 15: 8. 1900), described from Idaho. This, so far as the few words of description indicate, is referable to the intensely variable and polymorphic *S. Wallacei* Hieron.

⁷ The type of *S. Engelmanni* has not been seen by the writer.

⁸ Flora of Glacier National Park (Contr. U. S. Nat. Herb. 22: 235-438. pls. 33-52. 1921).

Hieron.; but a recent examination of a part of Hieronymus' type shows *S. montanensis* to be hardly distinct from *S. Wallacei*, as now understood. That collective species is well set apart from *S. densa* and allied species by its laxly cespitose or short trailing stems, its elongate ascending, branched, cordlike branches, and its uniform, rigidly ascending leaves, these never unequal and secund. Habital characters in this group were not well brought out by Hieronymus, who had, unfortunately, only very scant material at his disposal.

WASHINGTON, D. C.

A New Western Species of Pellaea.

F. K. BUTTERS.

In 1917, I published in the Fern Journal¹ some observations on *Pellaea atropurpurea*, *P. glabella*, and certain western forms related to the latter species. In that paper, I treated these western forms as varieties of *P. glabella*. After its publication Mr. W. R. Maxon called my attention to certain specimens of western *Pellaeas* in the National Herbarium, and very kindly sent me all the material of *P. glabella* and its varieties in that herbarium. The results of the study of this material, together with a considerable amount in the herbarium of the University of Minnesota were embodied in an article, which was prepared for publication last summer. An unfortunate loss of manuscript has necessitated the rewriting of this article, and as it will be several months at least before it can be published, it seems best to publish in a preliminary note the conclusions reached.

¹ Am. Fern Journ. 7: 77. 1917.