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Pellaea microphylla Mett. ex Kuhn

C. A. WEATHERBY

One of the rare ferns of the United States is the little plant, ranging from southwestern Texas to southeastern Arizona, which has passed for many years as *Pellaea pulchella*. So rare is it that there are in the Gray Herbarium only four sheets from north of the Mexican border and those were collected by Wright and Bigelow between 1849 and 1851. In Mexico, Pringle and Palmer have found it at a few places in Chihuahua and Coahuila. Late collections reported by Wooton and Standley¹ from New Mexico and by E. J. Palmer² from Texas add new stations, but do not materially extend the local and restricted range of this plant.

Wright seems to have made the first collection in 1849. When his specimens reached Europe and began to be studied there, Hooker referred this plant to the Mexican *Pellaea pulchella* and cited it under that name in the Species Filicum. Mettenius was of a different opinion and described it as a new species. Baker, somewhat impressed by Mettenius' view, treated it as a variety of *P. pulchella*³, and Christensen follows this reference in the Index Filicum. Eaton commented on the matter as follows:

"Among the ferns named by Mettenius and published after his decease by Kuhn, is *Pellaea microphylla*, which name was bestowed upon the northern specimens of the species above described [*P. pulchella*] to distinguish them from the Mexican form, the distinction being, according to Kuhn, that the Northern plant has 'furrowed rachises, and the ultimate pinnules smaller, and cordate.' The difference in form and size of the pinnules is too slight to be noticed; but our specimens certainly have the rachises slightly sulcate, or furrowed; and no furrowing is visible on the Chiapas specimens, which are, moreover, considerably taller and heavier

¹ Cont. Nat. Herb. 19: 24. 1915.

² In a paper on Texas ferns soon to be published in the JOURNAL.

³ Syn. Fil. ed. 2, 477. 1874.

than our form. But I am as yet unwilling to admit that the difference in size, etc., and in the terete or furrowed rachises, amounts to a valid specific distinction."⁴

He therefore reduced *P. microphylla* to a synonym of *P. pulchella* and, so far as I am aware, has been followed by all American authors who have had occasion to deal with the plant, up to the present time.

Yet there are other differences than those noted by Kuhn and Eaton (which by themselves would indeed be hardly sufficient to constitute a species). These may be summed up thus:

P. microphylla

Basal scales about 6 mm. long, more or less crisped in drying, *glabrous*.

Stipe and rachises *bright red-brown, very slightly or not at all glaucous*, shallowly channeled on the upper side.

Ultimate pinnules *very broadly ovate or orbicular, 2-4 mm. long, very nearly or quite as wide, more or less cordate at base, the margin revolute over the sporangia when young, in well-developed mature fronds spreading and plane.*⁵

P. pulchella

Basal scales 8-10 mm. long, thicker, not crisped in drying, *viscid*.

Stipe and rachises *dark brown, conspicuously glaucous*, terete or bluntly triangular in cross-section, not channeled.

Ultimate pinnules *oblong or narrowed gradually from the sub-truncate to cordate base to a blunt point, 3-5 mm. long, 2-3 mm. wide, 1/2 to 2/3 as wide as long, the fertile with the margin apparently permanently revolute over the sporangia, the sterile in young plants sometimes plane and orbicular.*

All of the above-noted characters are wholly constant in the material examined. The most striking and remarkable of them is found in the viscid scales of

⁴ Ferns of N. Am. 1: 83. 1878.

⁵ The measurements and description of the pinnules were taken mostly from mature plants evidently growing under favorable conditions when collected, in which the pinnules were spread out quite flat. In other specimens, either from poor pressing or because the plants were in a dried-up state before collection, not merely the margin, but the whole pinnule is so inrolled that its outline cannot be seen except by boiling out.

P. pulchella. In all the Gray Herbarium specimens numerous particles of earth and the like small objects are adhering to them, and the scales themselves, when boiled out, will still, after years of desiccation, stick to the dissecting needle. This is a character not found in any other species of *Pellaea*, so far as I am aware, and one not at all common among ferns.

In addition, *P. pulchella* is, as Eaton noted, ordinarily a notably larger plant than *P. microphylla*. In the material examined, the fronds of the latter ranged from 10 to 23 cm. in height, averaging slightly over 16; those of the former from 15 to 35 cm., averaging 26. The fronds of *P. pulchella* are, also, generally more compound. Both plants, so far as collectors' labels show, inhabit limestone ledges, but their ranges are wholly different. *P. microphylla* is confined to the arid regions of Texas, New Mexico, Arizona, and adjacent Mexico. *P. pulchella* occurs further south, from San Luis Potosi to Chiapas. Taking everything together, there can be little doubt that the two plants represent two closely related, but clearly and definitely distinct, species.

In the case of *P. microphylla*, a nomenclatorial question arises. It was published in *Linnaea* 36: 86 (1869). In the same year Fée published another *Pellaea microphylla* in his *Cryptogames Vasculaires du Brésil*. However, from data very kindly furnished me by Miss Mary A. Day, of the Gray Herbarium, there can be no doubt that the Mettenian publication was the earlier. *Linnaea* was issued in parts. The issue of part 1 of volume 36, which, as shown by printers' marks and remnants of the original cover in the Gray Herbarium copy, comprised pages 1-128, is noticed in the *Botanische Zeitung* for Sept. 10, 1869. It must, therefore, have appeared before that date. The preface of Fée's *Cryptogames Vasculaires du Brésil*, on the other hand, is dated

7 Nov., 1869, and the work could not have been published until after that date.

The synonymy of the two species and a list of specimens examined (all in the Gray Herbarium) follows:

PELLAEA MICROPHYLLA Mett. ex Kuhn. *Linnaea* **36**: 86. 1869.

P. pulchella Eaton Ferns N. Am. **1**: 81, pl. 11, 1878, and American authors, at least in part, not Fée.

TEXAS: 1849, *Wright* 824 in pt., 825. 1851, *Wright*, 2132.⁶

ARIZONA: Head of Rio San Pedro, Nov. 5, 1850, *Bigelow*.

CHIHUAHUA: Limestone ledges, Santa Eulalia Mts., March, 1885, *Pringle* 440. Santa Eulalia Mts., 2 Nov., 1885, *Pringle* 458.

COAHUILA: San Lorenzo Canon, 6 miles southeast of Saltillo, Sept. 21-23, 1904, *Palmer* 404. Mts. 6 miles east of Saltillo, July, 1880, *Palmer* 1423. Lerios, 45 miles east of Saltillo, July, 1880, *Palmer* 1424.

PELLAEA PULCHELLA (Mart. & Gal.) Fée. *Gen. Fil.* **129**. 1852.

Allosorus pulchellus Mart. & Gal. *Mém. Acad. Brux.* **15**: 47, pl. 10 f. l. 1842. Not *Allosorus pulchellus* Presl, 1836, which is a *Cheilanthes*. *Allosorus formosus* Liebm. *Vid. Selsk. Skr. V.* **1**: 220 (repr. 68). 1849.

SAN LUIS POTOSI: Limestone ledges, San Jose Pass, 16 Aug. 1890, *Pringle* 3401. Minas de San Rafael, June, 1911, *Purpus* 4882^a.

⁶ The localities of these Wright collections are uncertain. The Gray Herbarium sheet of No. 825 (the type collection of *P. microphylla*) gives no collection number. The collection number for No. 824 is apparently wrong, since it refers, in Wright's MS list, to a plant which is not a fern at all. To add to the confusion, specimens of *Cheilanthes aspera* were also distributed under No. 824. Two collections are included under No. 2132, one from "hills of the San Pedro, May 24, 1851," the other from "high, stony hills of the Pecos, June 1, 1851." The first locality is in Arizona, the second in Texas: any given specimen of that number may be from either state.

VERA CRUZ: Region d'Orizaba, Escamela, 16 Aug., 1866, *Bourgeau* 2894.

CHLAPAS, "etc." 1864-1870. *Ghiesbreght* 227.

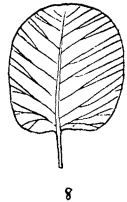
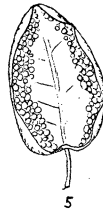
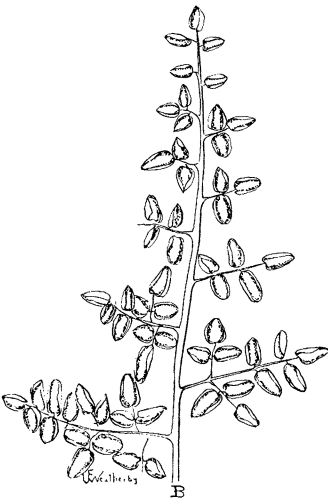
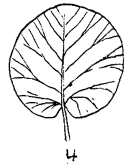
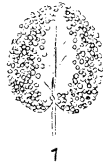
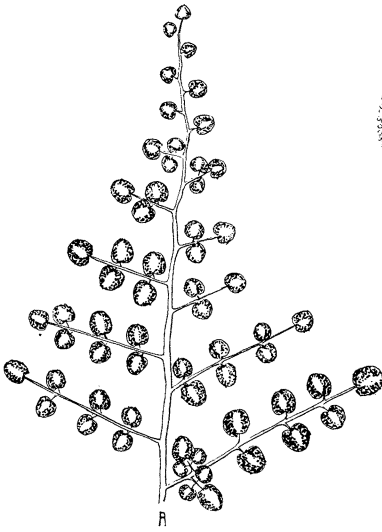
OAXACA: Cerro San Antonio, 1600 m., 20 May, 1906, *Pringle & Conzatti* 1395.

It is interesting to note that in the "Reliquiae" Kuhn published Mettenian descriptions of three species of *Pellaea*—*P. intermedia*, *P. glabella* and *P. microphylla*. The first, after a brief period of obscurity, came into its own. The work of Mackenzie and Bush, Pickett and Butters has recently established *P. glabella* as beyond question a distinct species. Now, with the gathering of more and better material, it is clear that *P. microphylla* must take its place beside them—no small tribute to the keenness of eye and good judgment of Mettenius in distinguishing species from meager material.

I am much indebted to Mr. William R. Maxon for his courtesy in turning over to me certain of his notes on the two species here discussed, whose distinctness he had recognized independently and before me; and for reading the manuscript of this paper.

EXPLANATION OF PLATE 5. A. *Pellaea microphylla*, tip of frond $\times 1$. Fig. 1, mature fertile pinnules; fig. 3, young fertile pinnule; figs. 2 and 4, sterile pinnule: all $\times 4$. B. *Pellaea pulchella*, tip of frond $\times 1$. Figs. 5 and 6, fertile pinnules; fig. 7, young fertile pinnule; fig. 8, sterile pinnule: all $\times 4$. The figures of *P. microphylla* were drawn from *Pringle* 458; those of *P. pulchella*, fertile from *Pringle & Conzatti* 1395, sterile from *Purpus* 4882a.

EAST HARTFORD, CONN.



PELLAEA MICROPHYLLA AND P. FULCHELLA