

men was collected in the mountainous region about Santa Fe, where the expedition encamped for several weeks, or at least within the present limits of New Mexico, rather than in the desert region of northwestern Texas, through which the route lay after the ninth of September.

The second "Arkansas" station cited in Wiegand's paper is, of course, erroneous also. The Hayden specimen from the upper Platte must have been collected in western Nebraska, northern Colorado or Wyoming. If any herbarium contains a dated duplicate of the specimen in the Gray Herbarium, it might perhaps be accurately localized by referring to the lists published in several volumes of the Reports of the Hayden Survey. Since the specimen is the type of the species, this would be well worth while.

It is unfortunate that these geographical slips should have been perpetuated by Buchenau (*Pflanzenreich*, iv. 36, p. 120), in a manner which affords no clue to correcting them,— "Bis jetzt nur bekannt aus Arkansas (Marcy, Hayden) und Idaho (Heller n. 3410)."

CAMBRIDGE, MASSACHUSETTS.

## SALIX PEDICELLARIS AND ITS VARIATIONS.

M. L. FERNALD.

THE attractive bog willow, which for several decades passed in America as *Salix pedicellaris* Pursh, was considered by Tuckerman<sup>1</sup> to be identical with the European *S. myrtilloides* L., although with the concessions that "the Lapland plant is less inclined to be glaucous" and is "distinguished by the broad, often cordate base of the leaves, a habit which I have never observed in ours";<sup>1</sup> and with the further comments that "Fries truly calls it elegant; noticing also, as does Wahlenberg, its resemblance in habit to *Vaccinium uliginosum*. It being a very northern and remarkably broad-leaved state of the species, which suggests this comparison, it is not surprising that our much larger and narrower-leaved form should not so well compare with our exclusively alpine and small-leaved form of the *Vaccinium*. Fries remarks upon *S. myrtilloides*, that its leaves do not easily blacken in drying: this is also true of our plant, which preserves all its beauty in

<sup>1</sup> Tuckerm., *Am. Jour. Sci.* xlv. 34 (1843).



the herbarium.”<sup>1</sup> In spite of the differences of foliage indicated by Tuckerman, the American and European plants certainly simulate one another strongly; and Tuckerman, as above noted, was inclined to give little weight to the slight differences he detected and to call the plants identical, especially since he observed no differences in the aments and since Koch had stated of the European plant “*foliorum forma valde variabilis, occurrunt scil. subrotundo-ovata, basi subcordata apice obtusissima, ovata, oblonga, acuminata, et lanceolata utrinque acuta.*”<sup>2</sup> The conclusions of Tuckerman, however, were not accepted by Torrey who said of *S. pedicellaris* “a low, very distinct and neat species, which my friend Mr. Tuckerman thinks is not distinct from *S. myrtilloides*, Linn., but I am not yet satisfied that they are the same”;<sup>3</sup> nor by Carey in his treatment of *Salix* in the first four editions of Gray’s Manual. But in 1858 they were taken up without perfect confidence by Andersson,<sup>4</sup> and in the fifth edition of Gray’s Manual (in 1867) the shrub, which up to that time had been generally known in America as *S. pedicellaris* Pursh, was treated as *S. myrtilloides* L. In 1865, however, Andersson<sup>5</sup> indicated very clearly that he could not accept Tuckerman’s view and treated the American *S. pedicellaris* as subspecifically separable from the European *S. myrtilloides*; and in the Prodrômus<sup>6</sup> he later kept it apart as an American variety.

In the sixth edition of Gray’s Manual, Bebb took the name *Salix myrtilloides* for the commonest tendency of the American plant, with elliptic-obovate leaves, and set off as var. *pedicellaris* a shrub with “leaves oblong-linear or oblanceolate,” which, as we shall later see, could hardly have been the plant originally described by Pursh as *S. pedicellaris*.

In preparing the manuscript for the seventh edition of Gray’s Manual it seemed best to restore to the American plant its earlier status as a species, *S. pedicellaris*, distinct from the Old World *S. myrtilloides*. The reasons for so doing may be briefly stated as follows. The American shrub is stouter and generally taller than the European, with nearly erect scattered branches; the short branches of *S. myrtil-*

<sup>1</sup> Tuckerm., Am. Jour. Sci. xlv. 34 (1843).

<sup>2</sup> Koch, De Salic. Eur. Comm. 52 (1828).

<sup>3</sup> Torr. Fl. N. Y. ii. 213 (1843).

<sup>4</sup> Anderss. Sal. Bor.-Am. 20 (1858).

<sup>5</sup> Anderss. Mon. Sal. 96 (1865).

<sup>6</sup> Anderss. in DC. Prodr. xvi. pt. 2, 230 (1868).



*loides* being numerous and divergent. The leaves of the American shrub, varying from obovate-oblong to linear-oblong (broadest above the middle), tapering to an acutish base, and usually glabrous from the first, are in maturity 3–8 cm. long; those of true *S. myrtilloides* of Europe, varying from round-ovate to ovate-oblong or oblong-lanceolate (broadest near the base), rounded or subcordate at base, and silky beneath when young, are in maturity only 1.5–3.5 cm. long. The American plant has larger aments and larger capsules, which are on pedicels 2–4 mm. long; the smaller capsules of the European plant being borne on pedicels 1–2 mm. long. *S. myrtilloides* is a shrub of arctic-alpine and high-northern distribution;<sup>1</sup> but the American *S. pedicellaris* is unknown from our colder regions, reaching its north-eastern limit in the St. Lawrence valley and having its great development in the boggy meadows of the northern United States and adjacent Canada. In its geographic range *S. pedicellaris* is thus to be classed with *Andromeda glaucophylla*,<sup>2</sup> which replaces in our bogs of temperate North America the hyperboreal *A. polifolia*.

This American species, *Salix pedicellaris*, has three pronounced variations. The commonest, and in some ways the most attractive, is the shrub with the obovate-oblong blunt or acutish leaves very glaucous beneath, those of the vegetative shoots becoming 1–2.5 cm. broad. This, the shrub called by Bebb in the sixth edition of Gray's Manual *S. myrtilloides*, has the capsules rather plump and bluntish, and it is widely distributed in sphagnous bogs or wet meadows from eastern Quebec to British Columbia, south to New Jersey, Pennsylvania, Illinois, and Iowa.

Another variation, similar in foliage and in capsules to the commonest tendency of the species, differs rather strikingly in having the leaves deep green upon both surfaces, only the very youngest, if any of them, glaucescent. This green-leaved shrub is apparently not common, the specimens before the writer coming from a few scattered stations — in Quebec, Vermont, New York, British Columbia, and Washington.

<sup>1</sup> *Salix myrtilloides* of northern Europe has been reported as occurring in northwestern arctic America, although Andersson qualifies his report by saying "sed ibi saepe cum aliis speciebus valde confusa" (Anderss. in DC. Prodr. xvi. pt. 2, 229). The writer has seen no American material which satisfactorily matches the European, but *S. fuscescens* Anderss. of Alaska and of Mt. Albert, Quebec, strongly resembles it. *S. fuscescens*, however, has the leaves broadest above the middle, much as in *S. pedicellaris*, and the large capsules are on very short pedicels (shorter than the scales).

<sup>2</sup> See RHODORA, v. 67–71 (1903).



The third variety is a little shrub, apparently as rare as the green-leaved plant, with the leaves very glaucous beneath but oblanceolate to linear-oblong, acute or subacuminate, and mostly less than 1 cm. broad. As it occurs in bogs along the Concord River in Bedford, Massachusetts, this narrow-leaved plant is recognized at some distance not only by its foliage but by the more slender and more prominently beaked capsules, which give the aments a looser appearance than is ordinary in the commoner variety. On the Concord meadows it occurs in small colonies by itself, often in wetter places than the other, but occasional shrubs present tendencies transitional to the common variety with obovate-oblong leaves and plumper blunter capsules. The narrow-leaved extreme is the plant obviously intended by Bebb as *Salix myrtilloides*, var. *pedicellaris* with "leaves oblong-linear or oblanceolate" and it seems to have formed a small part of Andersson's *S. myrtilloides*,  $\beta$ . *pedicellaris*. But in order to determine whether we are justified in applying the name *pedicellaris* to a plant with "oblong-linear or oblanceolate" leaves, which are very glaucous beneath, and with slender subulate capsules it is necessary to examine Pursh's original description of *S. pedicellaris*. This was as follows: "13. *S. ramulis laevigatis, foliis obovato-lanceolatis pedicellaris. acutis integerrimis utrinque glabris concoloribus, stipulis nullis, amentis coetaneis pedunculatis glaberrimis, squamis oblongis pedicello duplo brevioribus vix pilosis, germinibus ovato-oblongis longissime pedicellatis glabris, stigmatibus sessilibus bifidis.*

*S. pensylvanica Hortul.*

On the Catskill mountains, New York. h. April. v. v. This elegant and singular species flowered in the garden of G. Anderson, Esq., from a plant brought by me from America. He has one through another channel, which appears to be the male to this species." <sup>1</sup>

From this original description it can hardly be questioned that Pursh's *Salix pedicellaris*, with obovate-lanceolate leaves green on both sides and "germinibus ovato-oblongis" is the rare shrub noted above as the second variety. The two shrubs with the leaves glaucous beneath, both of which have been at times referred to *S. pedicellaris*, seem to have had no names which can be taken up for them and are here proposed as new varieties. The characteristics and bibliographic history of these three variations of *S. pedicellaris* are as follows.

<sup>1</sup> Pursh, Fl. Am. Sept. ii. 611 (1814).



*SALIX PEDICELLARIS* Pursh. Small subsimple or loosely branching shrub: branchlets elongate, strongly ascending: leaves obovate-oblong to broadly oblanceolate, obtuse or acutish at tip, acutish at base, green on both surfaces, glabrous from the first; in maturity subcoriaceous, 2.5–5 cm. long, 1–2 cm. broad: fertile aments thick-cylindric, on leafy peduncles: capsules reddish or yellowish, ovoid at base, tapering gradually to the thick blunt beak: pedicels 2–4 mm. long, twice exceeding the smoothish yellow scale: nectary about 1 mm. long.—Fl. Am. Sept. ii. 611 (1814); Eaton, Man. ed. 2, 415 (1818); Torr. Compend. 366 (1826) and Fl. N. Y. ii. 212, t. 120 (1843); Beck, Bot. N. & Mid. States, 319 (1833); Hook. Fl. Bor.-Am. ii. 150 (1839); Carey in Gray, Man. 429 (1848), in part; Robinson & Fernald in Gray, Man. ed. 7, 324, fig. 655 (1908), in part. *S. myrtilloides* Tuckerm. Am. Jour. Sci. xlv. 34 (1843); Anderss. Sal. Bor.-Am. 20 (1858); Gray, Man. ed. 5, 465 (1867); Britton in Britton & Brown, Ill. Fl. i. 505, fig. 1204 (1896); in part, not L. *S. myrtilloides*, subsp. *S. pedicellaris* Anderss. Mon. Sal. 96 (1865), in part. *S. myrtilloides*,  $\beta$ . *pedicellaris* Anderss. in DC. Prodr. xvi. pt. 2, 230 (1868), in part.—Originally collected by Pursh in the Catskill Mts., NEW YORK. Specimens examined from QUEBEC, boggy shores of alpine ponds, Table-top Mt., Gaspé Co., August 4, 1906 (*Fernald & Collins*, no. 494): VERMONT, Bristol bog, June 12, 1898 (*W. W. Eggleston & A. C. Dyke*, no. 360): NEW YORK, western part of the state (*Asa Gray*): BRITISH COLUMBIA, Telegraph Trail, latitude 54°, June 2, 1875 (*J. Macoun*, no. 1658): WASHINGTON, White Salmon, 1879 (*W. N. Saksdorf*).

Var. *hypoglauca*, n. var., foliis obovato-oblongis vel late oblanceolatis apice obtusis vel subacutis basi acutis vel subacutis supra viridibus subtus glaucis, junioribus rufescentibus tenuibus glabris, demum subcoriaceis 3–8 cm. longis 1–2.5 cm. latis; amentis femineis subdensifloris fructiferis 2–3.5 cm. longis 1.5–2 cm. crassis, rhachi 1–2 mm. crassa; capsulis purpurascentibus vel flavescentibus 5–8 mm. longis basi ovoideis crassiusculis apice obtusis.—Leaves obovate-oblong or broadly oblanceolate, obtuse or subacute, acute or subacute at base, green above, glaucous beneath; the young reddish, thin, glabrous; the mature subcoriaceous, 3–8 cm. long, 1–2.5 cm. broad: pistillate aments rather densely flowered, in fruit 2–3.5 cm. long, 1.5–2 cm. thick; the rhachis 1–2 mm. thick: capsules purplish or yellowish, 5–8 mm. long, ovoid and thickish at base, obtuse at tip.—*S. pedicellaris* Auth. in part, not Pursh. *S. myrtilloides* Auth. in part, not L.—Sphagnous bogs and wet meadows from eastern Quebec to British Columbia, south to New Jersey, Pennsylvania, Illinois, and Iowa. Type collected in swamp at Cow Island, West Roxbury, Massachusetts, by *F. F. Forbes*, May 22 and July 20, 1905. Among the very numerous specimens examined may be cited the following. QUEBEC, vicinity of Montmorency Falls, June 29, 1905 (*J. Macoun*, no. 68,788): NEW BRUNSWICK, open bog, Bathurst, July 25, 1902 (*Williams & Fernald*); Kent



Co., August 28, 1868 (*J. Fowler*): MAINE, Larch and Arbor-Vitae swamps, St. Francis River, August 13, 1902 (*Eggleston & Fernald*); boggy margin of Chemo Stream, Bradley, July 30, 1895 (*Fernald*, no. 375): VERMONT, Porter's Swamp, Colchester, May 13, 1895, June 28, 1896 (*A. J. Grout*): MASSACHUSETTS, Topsfield (*Wm. Oakes, Geo. B. Emerson*); Boxford (*J. Robinson, Faxon, Sears*); Concord River meadows, Bedford, May 27, 1906, May 23, 1909 (*Fernald*); Charles River meadows, Needham, May 6 and August 26, 1905 (*E. F. Williams*); Brookline, May 10 and 28, 1855 (*Wm. Boott*); Neponset meadows, Readville, August 23, 1892 (*E. & C. E. Faxon*): CONNECTICUT, in sphagnum, Stafford, September 1, 1903 (*C. B. Graves*); New Haven, May 7 and June 2, 1886 (*A. L. Winton*): NEW YORK, Stony Creek Ponds, July 6, 1899 (*Rowlee, Wiegand, & Hastings*); Junius (*Sartwell*): NEW JERSEY, Budd's Lake, June 25, 1869 (*T. C. Porter*): ONTARIO, Peninsula Harbor, Lake Superior, October 3, 1896 (*G. S. Miller*): MICHIGAN, Mackinaw to Sault Ste. Marie (*Loring*): ILLINOIS, Peoria (*F. Brendel*): MANITOBA, near Sidney, June 12, 1906 (*J. Macoun & W. Herriot*, no. 70,267): BRITISH COLUMBIA, Revelstoke, May 27, 1890 (*J. Macoun*).

Var. *tenuescens*, n. var., foliis oblanceolatis vel lineari-oblongis utrinque acutis subtus glaucis 6-10 mm. latis; amentis femineis fructiferis laxifloris, rhachi 1 mm. crassa; capsulis subulatis 7-10 mm. longis.—Leaves oblanceolate or linear-oblong, acute at both ends, glaucous beneath, 6-10 mm. wide: fruiting aments loosely flowered; rhachis 1 mm. thick: capsules subulate, 7-10 mm. long.—*S. myrtilloides*,  $\beta$ . *pedicellaris* Anderss. in DC. Prodr. xvi. pt. 2, 230 (1868) in part; Bebb in Gray Man. ed. 6, 485 (1890); Britton in Britton & Brown, Ill. Fl. i. 505 (1896); not *S. pedicellaris* Pursh.—Apparently a rare variety, of which material collected by the writer May 23, 1909, on the meadows of the Concord River, Bedford, Massachusetts, may stand as typical.

GRAY HERBARIUM.

## HAIRY-FRUITED VARIATIONS OF RHUS TOXICODENDRON.

ALBERT HANFORD MOORE.

WHILE looking over some material of *Rhus Toxicodendron* L. at the Gray Herbarium recently, the writer noticed a very curious specimen collected by E. B. Chamberlain and G. E. Dinsmore at Bristol, Maine. The ordinary northeastern *Rhus Toxicodendron* has, as the seventh edition of Gray's Manual rightly says, "berries whitish or cream-



Fernald, Merritt Lyndon. 1909. "SALIX PEDICELLARIS AND ITS VARIATIONS."  
*Rhodora* 11, 157–162.

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