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from reprint
(Copied by W. A. Archer - June 1964)

UNDESCRIBED WILLOWS OF THE SECTION CORDATAE

Carleton R. Ball

While this paper is a continuation of the series which has appeared under the title Notes on North American willows,¹⁾ this general title is 1) Bot. Gaz. 40: 376-380. 1905; 60: 45-54. 1915; 60: 391-399. 1915. dropped now in favor of a specific one for each contribution. This seems desirable because it will permit a clear indication of the contents of each paper in the title thereof. These papers have resulted chiefly from studies made in preparing the treatment of the genus *Salix* for different floras and manuals of botany.²⁾ /Not copied/

The location of the herbarium material cited is indicated by capital letters in parentheses, as follows: B, herbarium C. R. Ball; C, herbarium Canadian Geological Survey, Ottawa; F, Field Museum, Chicago; Ff, Felt Herbarium of Field Museum; Fs, Forest Service, United States Department of Agriculture; G, Gray Herbarium, Harvard University; I, Iowa Agricultural College; N, United States National Herbarium; R, Rocky Mountain Herbarium, University of Wyoming; RMP, herbarium of Rocky Mountains Park, Banff, Alberta, Canada.

*Bot. Gaz. 71:
426-437, June 1921*

S. lutea FAMELICA n. var.

DESCRIPTION

Shrub or small tree, 5- 6 m. tall; branchlets grayish, those of the season yellow, rather short and divaricate, glabrous; leaves small, stipulate; stipules mostly minute, 1- 3 mm. long; petioles slender, 4- 8 mm. long, yellowish, glabrous; blades linear-oblongate, narrowed and acutish or somewhat rounded at the base, acute to acuminate at the apex, 5- 6 cm. long, 8- 10 mm. wide, on vigorous shoots 7- 10 cm. long, 12- 20 mm. wide, yellowish green, glaucous beneath, glabrous and strongly reticulate on both sides, the margins cartilaginous and shallowly serrulate, or subentire.

Pistillate aments small, 2- 3 cm. long, on short peduncles 1- 3 mm. long, subtended by 2- 3 small leaves; capsule glabrous, lanceolate, 4.5- 5 mm. long; pedicel 1- 1.5 mm. long.

NOTES

This variety differs from lutea chiefly in the very small and more strongly nerved leaves. The aments and the pedicels both are shorter than the average for the species. It holds much the same relation to lutea as variety angustata does to cordata. The demarcation seems sharper in the present case but this may be due to the limited number of specimens in hand. The name means starved or hungry and is suggested by the attenuate leaves with their prominent "ribs".

The earliest collection seen by the writer was made in 1883 by L.F. Ward, on an island in the Yellowstone River, 12 miles above Glendive, Mont. The type was collected by the writer about 120 miles farther up the Yellowstone River. S. lutea is very abundant on the flood plain of the river at Forsyth, Mont. Several clumps of shrubs were examined, probably 15 or 20 in all, but only one was referable to the present variety. It consisted of

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only 2 or 3 stems, 8-10 cm. in diameter at the base, and 5 to 6 m. tall, located scarcely more than 10 rods from the north edge of the little town. It was recognized at sight as differing in some way from the other clumps and this difference was found to be in the size of the leaves.

Ward's specimen almost exactly matches the type, though the leaves are younger and smaller, the date of collection being 6 weeks earlier. The specimen from the Bellefourche River in South Dakota resembles cordata angustata a little more, just as the specimens of lutea from the Black Hills vary somewhat toward cordata. Further search probably will locate the variety in other parts of the Yellowstone Valley and in other districts. The first four specimens cited are all from one general district. The Bitterroot specimen is fragmentary and not well preserved ^{and} hence somewhat doubtfully referred here.

SOUTH DAKOTA. Bellefourche, along Bellefourche R., C. R. Ball 1347, Sept. 19, 1908 (B).

NORTH DAKOTA. Marmarth, wet bottoms, Little Missouri River, L. C. Moyer 469, June 6, 1914 (B).

MONTANA. Osprey Island in Yellowstone R., 12 miles above Glendive, L. F. Ward, July 17, 1883 (Fb 2380); -- Forsyth, north edge of town, B. R. Ball 1304, Sept. 1, 1908 (B, TYPE; N). -- Ritter Root Valley and Mts., Warm Springs Creek, alt. 7,500 ft., Pammel and Fawcett, Aug. 21, - Sept. 2, 1904 (B, I).

Salix ligulifolia
Salix ligulifolia H. var.

BIBLIOGRAPHY

Salix cordata Muhl., in part, as interpreted by Bebb, Willows of California, 85, 1879, and Bebb in Coulter, Man. Bot. Rocky Mtn. Reg. 335, 1885.

When first engaged in the study of this willow it was regarded as a species intermediate between cordata and lutea and a detailed description was written. Later it was considered more properly placed as a variety of lutea but the complete description has been allowed to stand. It is hoped that fuller field study may be given to this interesting form.

Shrub, 3-5 m. tall; bark dark gray; branches serrulate to entire, dark green, glabrous; anthers appearing with the leaves or the staminate precocious, subsessile, 2-4 cm. long; capsules 4-5 mm. long, glabrous; pedicel 1-1.5 mm. long, style about 0.5 mm. long.

Shrub with clustered stems 1.5-3.5 m. tall; bark dark gray; branchlets elongated, dark brown or somewhat yellowish, glabrous and usually shining, or the youngest pubescent; buds ovate-lanceolate, 3-10 mm. long, acute or obtusish, glabrous or pubescent, bright chestnut to dark brown. Drying black.

Leaves mid-sized, petiolate, stipulate; stipules semicordate and acute to semilunate and obtuse, 4-10 or more mm. long, entire or serrulate, glabrous, glaucous beneath; petioles 6-10 mm. long, dark brown, glabrous to puberulent to pubescent, as the twigs; blades ligulate-lanceolate or oblong-lanceolate (narrowly oblanceolate when young) acute or very short-acuminate, rounded or subcordate and usually oblique at base, 5-10 cm. long, 1-2 cm. wide, common sizes 5 by 1.2-1.5; 7 by 1.3-1.5; 8 by 2; 9 by 1.5-2 and 10 by 2 cm., entire or (especially on vigorous sterile shoots) shallowly and remotely serrulate or glandular-serrulate, reticulate on both sides, especially beneath,

Artemisia
ligulifolia
SALIX H. var.

BIBLIOGRAPHY

Salix cordata Muhl., in part, as interpreted by Bebb, Willows of California, 85, 1879, and Bebb in Coulter, Man. Bot. Rocky Mtn. Reg. 335, 1895.

Salix cordata watsoni Bebb, in part, as interpreted by Ball, in Coulter and Nelson, New Man. Rocky Mtn. Bot. 132, 1909.

DESCRIPTION

Low caespitose shrub, branchlets dark brown; leaves ligulate-lanceolate, acute, rounded at base, 6-10 cm. long, shallowly serrulate to entire, dark green, glabrous; anthers appearing with the leaves or the staminate precocious, subsessile, 2-4 cm. long; capsules 1.5 mm. long, glabrous; pedicel 1-1.5 mm. long, style about 0.5 mm. long.

Shrub with clustered stems 1.5-3.5 m. tall; bark dark gray; branchlets elongated, dark brown or somewhat yellowish, glabrous and usually shining, or the youngest pubescent; buds ovate-lanceolate, 3-10 mm. long, acute or obtusish, glabrous or pubescent, bright chestnut to dark brown. Drying black.

Leaves mid-sized, petiolate, stipulate; stipules semicordate and acute to semilunate and obtuse, 4-10 or more mm. long, entire or serrulate, glabrous, glaucous beneath; petioles 6-10 mm. long, dark brown, glabrous to puberulent to pubescent, as the twigs; blades ligulate-lanceolate or oblong-lanceolate (narrowly oblanceolate when young) acute or very short-acuminate, rounded or subcordate and usually oblique at base, 5-10 cm. long, 1-2 cm. wide, common sizes 5 by 1.2-1.5; 7 by 1.3-1.8; 8 by 2; 9 by 1.5-2 and 10 by 2 cm., entire or (especially on vigorous sterile shoots) shallowly and remotely serrulate or glandular-serrulate, reticulate on both sides, especially beneath,

dark green above, pale and at maturity usually white glaucous beneath, glabrous throughout or the white midrib puberulent above near the base.

Aments appearing with the leaves or somewhat precocious; sessile or the pistillate on short peduncles 3-5 mm. long; pistillate aments 2-3.5 cm. long, subsessile, or on peduncles 3-5 mm. long, subtended by 2-4 very small leaves; scales elliptic-oblong, obtusish, drying ^lback, glabrate outside at the apex, the basal portion and the inside densely white-tomentose; capsule small, lanceolate or ovate-lanceolate, 4-5.5 mm. long, glabrous; pedicel 1-1.5 mm. long, glabrous; style 0.3-0.5 mm. long; stigmas short, entire, notched or bifid.

Staminate ament ^ssessile, naked at the base, or with 1 or 2 small bracts; slender, 2-3 cm. long, 4-8 mm. wide; stamens 2, filaments slender, glabrous, free; scales as in the pistillate ament.

Salix lutea ligulifolia is a mountain loving form. It is found in the Rocky Mtn. system from the Black Hills of South Dakota, and the Laramie Hills and Medicine Bow Mts. of southeastern Wyoming, south to southern New Mexico and central Arizona. An isolated distribution occurs in extreme western Nevada and the adjacent Yosemite Valley of California.

It appears to be confined to stream banks in mountain canons at elevations from 5,000 feet (1,500 m.) to probably 9,000 feet (2,700 m.), though its upper limits are unknown yet. It flowers from the last week in April till well into May, and fruits in due season thereafter.

From typical S. lutea it is distinguished by usual ^{dark} dark-brown branchlets, longer and narrower, strap-like, usually dark-green leaves, with the margins often nearly parallel, and usually entire or only shallowly serrulate. The capsules also are shorter and on fairly short pedicels.

Specimens collected when the leaves are just unfolding resemble Salix irrorata but may be distinguished by somewhat lighter-colored twigs, without the glaucous bloom, and by the broader, less oblanceolate leaves and longer

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SPECIMENS EXAMINED.

CALIFORNIA. Yosemite Valley, H. N. Bolander 6331, June 3, 1866 (FBb), 6335 (N); --

NEVADA. Washoe Co., Hunter's Canon, vicinity of Reno, 1350-1500 m., A. E. Hitchcock 455, July 18, 1913 (N); -- No locality (probably Washoe Co.) Lieut. Wheeler, 1872 (N) twig densely pubescent); -- Soda Springs Canon, Mineral (Esmerelda) Co., W. H. Shockley 363, May, 1886 (FBb).

ARIZONA. Grand Canon, Indian Gardens, alt. 3,800 ft., E. A. Goldman 2237, Aug. 25, 1913 (N, twig densely pubescent); -- Navajo Co., Black Mesa Forest Reserve: Black Canon, Houck's ranch, F. V. Coville 1084, June 5, 1900; along creek at Showlow, Coville 1091, June 8, 1900; 2022, July 4,

1904 (N, both specimens with pubescent-pilose young twigs and broader and more serrulate leaves); -- Apache Co., Springerville, elev. 7000 ft., E. A. Goldman 2446, June 8, 1915 (N); ~~+~~ White Mtn. Indian Reservation; watershed of White R. above Ft. Apache, F. V. Coville 1977, 1981, June 30, 1904 (N); ~~+~~ White Mtns., south of Thomas Peak, Coville 2014, July 2, 1904 (N); along White R. near Ft. Apache, Coville 2016 and 2020 (seasonal twigs pubescent, leaves broader and more serrulate), July 3, 1904 (N); White Mts., head of Black R., L. N. Gooding 1212, July 18, 1912 (N); White Mtn. Apache Reservation, Mrs. Myrtle Zuck, June 25, 1907 (N).

UTAH. Kane Co., Three Lakes, north of Kanab, I. Tidestrom 2417, July 9, 1909 (B).

NEW MEXICO. No locality (probably Silver City, Grant Co.), E. L. Greene, (FBb 3908, in part); -- Grant Co., Ft. Bayard, Stephen's Ranch, J. C. Blumer 171, Nov. 15, 1905 (B); -- Lincoln Co., White Mts., alt. 7000 ft., E. O. Wooton 307, Aug. 10, 1897 (N); -- Union Co., Cross L. Ranch,

head of Cimarron Canon, D. Griffiths 4305, May 11, 1903 (B, N) λ #

COLORADO. Montezuma Co., Mancos, Alice Eastwood 22, June, 1891 (N); --
La Plata Co., Durango, Alice Eastwood 23, June, 1891 (N); -- Saguache Co., Cocha-
topa Natl. Forest, rear Big Meadows, elev. 9,500 ft., W. O. Sanders, July
8, 1916 (B); -- Conejos Co., Los Pinos, alt. 7,000 ft., C. F. Baker 270
(in part) May, 1899 (F, N); -- Las Animas Co., Stonewall, Johnston and Hedgcock
498, June 18, 1917 (B); -- Costilla Co., Blanca, alt. 7,752 ft., E. R. Warren
72; July 16, 1912 (B); -- Pikes Peak district, Little Fountain Creek, J. C.
Blumer 5, 6, Sept. 5, 1903 (B); Manitou, alt. 6,000 ft., M. E. Jones 30,
May 8, 1878 (N, twigs pubescent); -- Park Co., Cassells, E. W. Cathcart,
June, 1904 (N); -- Lat. 39- 41 degrees, Hall and Harbour 524, 1862 (Feb); --
Routt Co., Walcott, Alice Eastwood 17 (in part), July, 1891 (Feb).

SOUTH DAKOTA. Custer Co., (Black Hills), Beaver Creek, Mayo, W. H. Over,
1857, June 18, 1914 (N);

WYOMING. Albany Co.: Little Laramie R., L. N. Gooding 5, 6, June 14,
1901 (B); Islay, foothills west of, alt. 7,300 ft., Merritt Cary 313a,
June 25, 1909 (N); λ

S. LUTEA PLATYPHYLLA n. var.

Salix cordata var. Bebb in King, U.S. Geol. Explor. 40th.

Parallel 5:325, 1871.

DESCRIPTION.

Shrub or small tree 3-6 m. tall; branchlets virgate or somewhat divaricate, yellow, shining, glabrous; buds yellow.

Stipules mostly small, semicordate to sublunate; petioles very slender, 8-15 mm. long, yellow, glabrous; blades differing from those of the species in being broader and shorter, elliptic-obovate, acute or short-acuminate at the apex, broad and rounded or obliquely subcordate to cordate at base, 1.5-3 cm. wide, 4-8 cm. long, common sizes being 2 by 4, 2-2.5 by 5, 2-2.5 by 6, and 2.5 by 7 cm., while sprout leaves reach such dimensions as 3.5 by 8, 4.5 by 9 and 4-4.5 by 11 cm.

The aments are the same as in the species except that the capsules are longer-stalked, the pedicels ranging from 1-2.5 or sometimes 3 mm. in length.

NOTES

This variety occurs rather commonly in the Wasatch mountain system from southwestern Utah to Idaho and thence ranges northward into Oregon (fig.). It is probable that it is more abundant than the species ^{new} as cited would indicate. It is separated from lutea by the broad, ovate-lanceolate leaves and the more elongated pedicels, 1.5-2.5 or 3 mm. long. In flowering specimens, however, neither the broad leaves nor the elongated pedicels are certainly distinguishable. It is almost exactly the form described by Bebb as "S. cordata var."

Nuttall describes lutea as having ovate-lanceolate leaves

but states that they are more lanceolate than ovate. This statement agrees with Nuttall's figure (Sylva 1:63, pl. 19) and with the form of leaf on the co-type specimen, in which also the pedicels are very short, scarcely exceeding 1 mm. The following specimens are referred to this variety:

UTAH. Beaver Co., Milford, L. N. Gooding 1020, June 4, 1902 (B, N); — Juab Co., Nephi, C. R. Ball 94, Oct. 8, 1907 (B, N) and (by F. D. Farrell from same plant) June 19, 1909 (B); — San Pete Co. common in Coal Canyon, San Pitch Mts., I. Tidestrom 1304, June 24, 1908 (N); — Carbon Co., Indianola, I. Tidestrom 2247, June 17, 1909 (B); — Salt Lake City, City Creek Canon; alt. about 6,000 ft., M. E. Jones 1702, May 11, 1880 (N); alt. 5,000 ft., S. G. Stokes, May 1, 1900 (N); P. A. Rydberg 6040, June 9, 1905 (N); C. R. Ball 1335, 1336, ^(B, type) Sept. 11, 1908 (B, N); — Farmington Canon, near Salt Lake City, Pammel and Blackwood 3618, July 14, 1902 (B, I); — Petersen, Weber R., alt. 6,500 ft., Pammel and Blackwood 3903, July 18-24, 1902 (B, I); — Ogden Canon, Ogden, A. E. Hitchcock 1481, Aug. 19, 1913 (N); — Ogden, alt. 4,300 ft., M. E. Jones 6552, May 29, 1889 (N).

WYOMING. Sweetwater Co., Bush Ranch, A. Nelson 7103, June 10, 1900 (B).

IDAHO. Bear Lake Co., Montpelier, J. F. McBride 17, May 15, 1910 (G, N with specimen of S. caudata); — Canyon Co., along the river, Bennett, alt. 2,200 ft., J. F. McBride 790, Apr. 29, 1911 (N).

OREGON. Blue Mtns., head of Otis Creek, W. C. Cusick 1645, June 15, 1897 (N); — Sherman Co., Moro, C. R. Ball 1853, Aug. 4, 1914 (B, N); C. R. Ball 2010, 2011, June 29, 1915 (B, C, F, G, I, N, R); — Grass Valley, C. R. Ball 2012, June 30, 1915 (B); — Des(c)hutes River, Thos. Howell, May, 1886 (N).

NEVADA. Humboldt Co. Santa Rosa Natl. Forest, mouth of Hansen Creek Canon, alt. 4,800 ft., B. S. Martineau 26 (in part), May 7, 1915 (B, Ps).

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monochroma
SALIX RASTRELLII Ball n sp.

BIBLIOGRAPHY.

Salix cordata in part, of various authors treating of the Pacific Northwest, not of Muhl.

Salix pyrifolia as interpreted by Ball, in Coult. & Nelson, New Man. Rocky Mt. Bot. 133, 1909, not of Andersson, 1867, or Schleicher, 1815.

? Salix rotundifolia ? Nutt., N. A. Sylva 1: 75, 1842, not Trautveiter, 1832.

DESCRIPTION.

Low shrub, with slender, glabrous, shining branchlets and small stipules; leaves obovate-oval or ovate, short-acuminate, 4-8 cm. long, crenulate-serrulate, thin, deep green and glabrous on both sides; aments appearing with the leaves, the pistillate short-pedicelled, lax; scales lanceolate-oblong, acute, dark, thinly pilose; capsule lanceolate, acute, 5- 6.5 mm. long, glabrous; pedicel 2-4 mm. long, style about 0.5 mm. long; staminate ament sessile, slender; stamens 2, filaments glabrous, united. more or less

Low shrub, 1-3 m. high; bark gray; branchlets slender, mostly elongated and virgate, sometimes shorter and divaricate; yellowish or bright chestnut to brown, glabrous, shining, full of leaf scars; buds slender, 4-7 mm. long, acute, chestnut to dark brown, glabrous, inconspicuous.

Leaves stipulate, petiolate; stipules narrowly ovate to lunate, crenate-serrulate to denticulate, color and texture as in the blades; petioles slender, 4-8 or 10 mm. long, or to 15 mm. long on sprout leaves, yellowish to dark brown, glabrous or puberulent; blades elliptic-oblongate to obovate-oval or ovate, acute to short-acuminate, or the distal ones acuminate, 4-8 cm. long, 1.5-4 cm. wide, common sizes being 4 by 2, 5 by 2.5, 6 by 2.5-3.3, 7 by 2.5-3.5, 8 by 3, rounded to truncate or slightly cordate at the base, glandular crenate-serrulate, those on luxuriant sterile branchlets and sprouts much larger, 8 by 4 or 10 by 3.5 cm., all thin, translucent, deep, rich green on both sides; the primary and secondary veins slender and somewhat raised on both surfaces, glabrous, at first thinly pilose-pubescent.

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Ament slender, lax, appressed with the leaves, on short leafy peduncles; pistillate peduncle 5-8 or sometimes 13 mm. long, pubescent, bearing 2-4 small leaves 1-3 cm. long; the staminate aments nearly sessile.

Pistillate ament 2.5-6 cm. long, 1.5-2 cm. wide, lax; the capsule lanceolate or rostrate from a subovate base, 5-7 mm. long, glabrous; pedicel slender, 2-4 mm. long; style 0.4-0.6 mm. long, stigmas short, stout, mostly notched; scales elliptical-oblong, or oblongate, light brown, drying black, acute or obtusish, thinly clothed outside and more densely so inside with long crinkly hairs; gland 1, linear-clavate, elongated, sometimes 1.3 mm. long, usually shorter.

Staminate aments sessile, 2.5-6 cm. long (subtended by 2-3 leaves 1.2 cm. long), 1 cm. wide, slender, scales as in the pistillate aments; stamens 2, filaments glabrous, united for five to seven tenths of their length.

NOTES.

Salix monochroma ranges from the Yellowstone Park of northwestern Wyoming and adjacent Montana to the Willamette Valley of western Oregon and north to southern British Columbia, and southern Alberta. It is a shrub of stream banks in the mountains of this section. Apparently it ranges in altitude from about sea level (Portland) to 5,000 or 6,000 feet (1,500 to 1,800 m.) in the mountains or occasionally to somewhat higher elevations. The flowers appear from about April 15 to May 15, and fruit follows in due season. At the higher altitudes the dates are considerably later.

The writer was in error in placing this species under the name pyrifolia in the New Manual of Rocky Mountain Botany. This was due to a misinterpretation of Anderson's species.

Salix monochroma is found quite commonly in at least four States and sparingly in others and is represented by fairly abundant herbarium material. It seems, however, never to have been described previously, unless Nuttall's rotundifolia is correctly interpreted as belonging here. Nelson's 6101 from the Yellowstone Park comes the nearest of any of the specimens cited, to matching Nuttall's description.

S. monochroma is most closely related to mackenziana on the one hand, and to pseudomyrsinites on the other. From mackenziana it is separated by the very thin leaves, never even glaucescent, but colored deep green alike on both sides, and more ovate in outline. From pseudomyrsinites it may be separated by the much thinner and broader leaves, less glandular, and with much more slender veins. The pedicels also are shorter and usually glabrous.

The following specimens are referred to this species

monochrome
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SPECIMENS EXAMINED.

WYOMING. Hoback range, woods, Hudsonian zone, alt. 10,000 ft., Merritt Cary 661, AUG. 9, 1911 (N); — Yellowstone Nat'l. Park, E. A. Mearns 633, May 11; 1112, June 15; 1363, June 24, 1902 (N); in a ravine in the woods, Obsidian Creek, 2-4 ft. high, Aven Nelson 6101, July 24, 1899 (B).

MONTANA. Livingston, E. W. Scheuber, June 1, 1901 (N).

IDAHO. No locality (probably Boise or northward), Coville & Kearney 241 (N), 244, May, 1899 (B, N); — Cuddy Mts., Washington Co., alt. 6,000 ft., M. E. Jones 6547, July 11, 1899 (N); — Nez Perces Co.: valley of Hatwai Creek, Sandberg, MacDougal and Heller 93507 2 type 2; 24299 5 type 8) 39, April 24 (G, N); 70, April 28 (N); valley of Clearwater R. (on island) 96, May 2, (F, G, N); valley of Peter Creek, 117, May 4 (Feb 2679, G, N); canyons, valley of Lake Waha, 215, May 21 (Feb 2828, G, N); along Hatwai or Peter Creeks, 1046, May 4, or 10, 1892 (N, 2 sheets); about Lewiston, A. A. and E. G. Heller 2942, April 23, 1896 (N); — Latah Co.: L. F. Henderson 2880 (Wessels), 7894 (Feb); along Paradise Creek, near Moscow, Henderson 2882 (in part), June 2, 1894 (Feb); along the Potlatch R., near Juliaetta, Henderson 2883, April 21, 1894 (Feb);

OREGON. Blue Mts., mostly Union Co.: common along streams, Union Co., W. C. Cusick 875, 1880; alt. 8,000 ft., Cusick 968 (in part), Sept., 1882 (N); Crane Prairie, So. Blue Mts., W. C. Cusick 1652 (in part), June 17, 1897 (N); stream banks, Cusick 1845, Apr. 26, May 9, Sept., 1898 (N); bank of Catherine Creek, alt. 3,500 ft., Cusick 2383, May 30, June 28, 1900 (F, G, N); Union, G. R. Hyslop 2058, July 18, 1916 (B); — Wallowa Co.: along Chemnimms Creek, Chico Station,

Imnaha Nat'l. Forest, alt. about 1,000 m., F. V. Coville 2328, May 27, 1907 (N); Headwaters of Mad Creek, alt. about 1,350 m., Coville 2390, June 8, 1907 (N); -- Umatilla Co., ford of Umatilla River, South of Mission and 5 miles east of Pendleton, C. R. Ball 2089, Aug. 20, 1917 (B); -- Grant Co., Izee, Griffiths and Hunter 199, July 15, 1902 (B); -- Deschutes R., Thomas Howell, May 9, 1885 (Fb); -- Bend, on Deschutes R., E. Nelson, May 22, 1905 (B); -- Linn Co., Fish Lake, F. A. Walpole 305, Aug. 1, 1899 (N); -- Portland, L. F. Henderson, 1896 (Fb 6234).

WASHINGTON. Whitman Co., Pullman: A. D. E. Elmer 111, May, 1897 (B); C. V. Piper 3598, May 13, 1898 (B); -- Walla Walla Co., Waitsburg, R. M. Horner 446, April 22 (N), 447, April 9, 1897 (N); -- (west) Klickitat Co., Columbia R., W. N. Saksdorf 40, April 25, 1884 (B); -- no locality, probably Klickitat Co., E. F. Sheldon 8124, 1897 (N); -- Kittitas Co., Wenatche Mts., F. V. Coville 1177, Sept. 4, 1901 (N); -- Okanogan Co., along Ashmola River, Sheep Mt.- Bald Mt. Trail, Okanogan Forest, alt. 1,630 m., W. W. Eggleston 13395, Aug. 2, 1916 (N).

ALBERTA. Rocky Mountain Park, vicinity of Banff, N. B. Sanson 76, 119, June 9 and 20, 1911; 257, 260, 262, 263, 264, 266, 267, 299, 302, 311, between July 4 and July 15, 1911; 341, 380, 387, 2038, between Aug. 2 and Aug. 14, 1911; 511, June 29, 1912; = , July 1, 1912 (B, BMP).

S. farrae walpolei Cov. & Ball, in Bot. Gaz. 71:435, June, 1921;—

~~Schubert, in Bot. Calif. 1:137, 1922.~~

Low shrub, 0.5-2.5 m. tall, branchlets divaricate, dark, the youngest pubescent; leaves elliptic-oblanccolate or broadly elliptical to obovate, mostly acute at both ends, 4-8 cm. long, 1.5-3.5 cm. wide, nearly entire, glabrous, glaucous beneath; aments coetaneous, on leafy peduncles, slender, rather lax; pistillate 2-5 cm. long; capsules 5-7 mm. long, obtuse, glabrous; pedicel 0.5-1 mm. long; style very short; scales pale brown, 0.8 mm. long; staminate aments 2-3 cm. long; stamens 2, filaments glabrous, free.

Low shrub, 0.5-2.5 m. high; bark probably dark gray; branchlets stoutish, short, divaricate, the older dark gray to brown, the younger mostly short, divaricate, dark brown to black, the 2-year, 1-year, and seasonal twigs more or less densely pubescent with gray hairs, or puberulent, often becoming glabrate or glabrous, all rather closely beset with bud scars; bud-scales (seen only on flowering or fruiting specimens) minute to small, 1-3 mm. long, lanceolate-conic, thinly pubescent to glabrous.

Leaves mid-size, petiolate, stipulate; stipules minute to small, lanceolate or semi-cordate to ovate, acute, entire or denticulate, 1-3 mm. long; petioles slender, 2-10 mm. long, yellowish to dark brown, pubescent, becoming glabrate; blades elliptic-oblanccolate, broadly elliptical or ob-ovate-oval to obovate, acute or sometimes rounded at base, acute or abruptly short-acuminate, or the obovate leaves sometimes obtuse at apex, 4-8 cm. long, 2-3.5 cm. wide, common sizes being 5 by 2-2.5, 6 by 2-2.5, 7 by 2.4-3, and 8 by 3.5 cm., the outer half entire or often shallowly and rather remotely crenulate, thin, glabrous, green above, glaucous beneath, sparsely reticulated with slender veins on both surfaces; at maturity, often with impressed vein above and rugose veins beneath while unfolding.

Walpolei

Aments slender, rather lax, appearing with the leaves, on leafy peduncles; pistillate peduncle 1-2 cm. long, bearing 2-4 leaves 2-4 cm. long; ~~pistillate peduncle~~ staminate peduncle 5-10 mm. long, bearing 2-3 leaves 1.5-2.5 cm. long; pistillate aments 2-5 or 6 cm. long, 12-15 mm. wide, lax in fruit, rachis scantily tomentose; capsule narrowly lanceolate, ~~retrorse~~, ~~or conic-rostrate~~, acute at base, 5-7 mm. long, mostly obtuse at apex, greenish-brown, glabrous; pedicel slender to stoutish, 0.5-1 or rarely 1.5 mm. long, glabrous; style very short, 0.2-0.3 mm. long, stigmas short, notched; gland 0.5-0.7 mm. long, cylindrical, capitate; (scales oblanceolate,) seeds linear-oblong, 1 mm. long, brown, ~~obtusish~~ or acute, pale brown, nearly glabrous outside, thinly pilose inside, about 0.8-1 mm. long; staminate aments slender, spreading, 2-3 cm. long, 1 cm. wide; stamens 2, filaments glabrous, free; anthers short, obovate to nearly orbicular, reddish or purplish; scales as in the pistillate ament.

Salix farrae walpolei is separated readily from the species by the pubescent-pilose young twigs, the broader, more obovate leaves, the longer and laxer aments, and the shorter styles. Walpole's No. 1624 in the U. S. National Herbarium is designated as the pistillate type. His No. 1742 has the best aments of any of the 3 staminate specimens seen and is designated as the staminate type. ^{The variety} It flowers from about June 20 onward through July or early August, according to location.

This willow rather closely resembles Salix balsamifera (Hooker) Barratt, from which, however, it is readily separated by the entire leaves, seldom rounded and never cordate at the base, the short pedicels, and the somewhat shorter styles. Its nearest relative on the cordata side is Salix mackenziana (Hook.) Barr., from which it is separated easily by the thin, entire, elliptic-obovate leaves, and more especially by the short pedicels.

The variety is named for Mr. F. A. Walpole, since deceased, who collected several specimens of it in the vicinity of Port Clarence, near Cape Prince of Wales, Bering Strait, the most western locality at which it has been found. The specimens referred to it are cited below. So far as known it is the only member of the section Cordatas with an exclusively Arctic distribution.

(Distribution lacking - Waa)

27

The specimens representing this variety were segregated several years ago in the collection of Alaskan plants of the U. S. National Herbarium, under the unpublished name "*Salix walpolei*," by Dr. F. V. Coville. When the writer was preparing a revision of the Cordatae, before the Great War, Prof. Coville suggested to him that the species be described by the writer and published jointly, which was agreed to.

Completion of the revision was delayed by the war. Later while working up the extensive collections of Prof. H. B. Sanson from the Rocky Mountain Park, at Banff, Alberta, and the material collected by Mr. F. C. Standley in Glacier National Park, Montana, numerous specimens were found to represent undescribed species first recognized by the writer in some incomplete material sent him by Miss Edith M. Farr, who had collected it in the vicinity of Luguan and Field, B. C., above Banff. With the aid of the more abundant material it was possible to complete the description of the species, which was dedicated to Miss Farr and published in Standley's Flora of the Glacier National Park, Montana, p. 3.

SALIX LASIOLEPIS var. BAKERI (v. Seem.) Ball, n. comb.

BIBLIOGRAPHY.

Salix bakeri von Seemen, Bull. Terr. Bot. Club 30:
635, Nov., 1903.

DESCRIPTION.

Shrub or small tree essentially like lasiolepis in
all respects, except that the capsule is thinly pubescent,
especially toward the apex. The capsule, 5- 6 mm. long,
appears to be slightly larger than in the species and the
style slightly longer.

2

NOTES.

When Dr. von Seemen described S. bakeri he did not compare it with lasiiolepis or mention that species in any way. He published two other species in the same paper, viz. franciscana and cransbyensis. In neither case did he indicate their relationships or mention other species in connection with them. We might infer either that American species were not well represented in the Berlin herbarium or that Dr. von Seemen did not look them over.

His description of bakeri fits lasiiolepis perfectly except in the one phrase "apex with short gray hairs" in reference to the capsule. All the evidence goes to show that the describer was unaware of lasiiolepis rather than that he was knowingly segregating from it a new species with pubescent capsules.

This variety is comparable to variety puberula under commutata. To some extent, it may be compared to variety ida-hoensis under wolfii.

Two specimens collected by F. A. Walpole, at Modoc Point, Klamath Co., (2198, 2200), on June 5, 1902 (N), are similar to the specimens cited below. The capsule, in the Klamath specimens, however, is longer, 6- 8 mm. long, much resembling that of S. scouleriana. I have, therefore, considered these two to be hybrids between lasiiolepis and scouleriana. It is possible that the plants here referred to var. bakeri are hybrids also, but this is less probable. One striking character in the Klamath species^m is the elongated pedicel, 1.5- 2.5 mm.

in No. 2198, which is longer than in either supposed parent.

SPECIMENS EXAMINED.

CALIFORNIA. Foothills near Stanford University,
Santa Clara Co., C. F. Baker 274, March 9 and May 10, 1902
(N, cotype); -- Berkeley, W. L. Jepson, Mar. 24, Aug. 15, 1891
(N).

April 22, 1921

Dr. John M. Coulter,
Department of Botany,
Chicago University,
Chicago, Illinois.

Dear Doctor Coulter:

I am in trouble again. You will recall that once before I asked you to withdraw temporarily a paper which I had submitted and substitute for it another which I desired to have issued promptly. I am about the same position this time.

You will recall that Dr. C. K. Schnieder has been publishing with revision of North American Willows in the Journal of the Arnold Arboretum. He was aware that I had nearly completed a revision of the sections *corelatae* and *commutatae*, at the time the war broke out, but was obliged to drop all work of that character for some years. He refrained, therefore, from publishing the first section, but did publish on the second. He is now about to publish the *corelatae* also. I have my monogram on this practically completed, but apparently it is impossible to get it published for a year or so because of its length and the congestion of all botanical journals. In order to save my new species and varieties, therefore, I am compelled to take them out of the manuscript and of the revision and offer them for publication separately. I have one new species and four varieties in manuscript now and another new species in sight. Whether that will be all, I do not yet know.

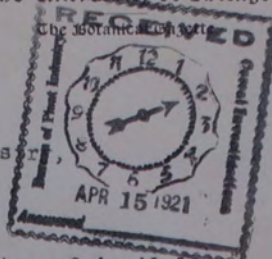
Dr. Schnieder's paper will appear in the July issue of the Journal. Will it be possible for you to handle this paper of mine in the May or June numbers of the Gazette? I suppose that there will be about 20 pages of manuscript similar to the one recently submitted. I will submit only the novelties at this time. I would like to send a print for a half-tone of each new species and will be glad to do the same for the varieties if you can handle that many illustrations. I will appreciate a reply from you at an early date, as I will try to make arrangements elsewhere if the Gazette cannot handle this paper.

With best regards, I am

Very sincerely yours,

CRB:MMK

Cerealist in Charge.



April 12, 1921.

Dr. C. R. Ball,
Bureau of Plant Industry,
Washington, D.C.

Dear Dr. Ball:

I have your letter of April 11 in regard to prompt publication of your paper on new species. The material for the May number is already in process of printing, but I think we could take care of this in the June number if we can have it within the next week or so.

In regard to illustrations. I suppose by half-tones you refer to text cuts, in which case we could illustrate the varieties also. If your illustrations would be plates, we are compelled to restrict their number to four with a single article, for their cost at the present time is so exorbitant.

I also have your letter of April 8 including the first page of another manuscript, and referring to a previous letter, that of April 2. I regret that I neglected to acknowledge the receipt of this manuscript and the two letters sooner, but I have been away from my desk for a number of days. According to your directions, we shall hold this paper already in hand, and publish it after the one that is to appear in the June number. I hope we can take care of this also before the summer is over. We are getting considerably "caught up" with contributions in hand, so that we can now take care of articles within a reasonable time after their receipt.

Yours sincerely,

John M. Coulter

April 19, 1921.

Dr. John M. Coulter,
Department of Botany,
Chicago University,
Chicago, Illinois.

Dear Doctor Coulter:

Your letter of April 12th is received, and I am
delighted with the prospect.

The manuscript will be sent you within the next
few or three days.

Very sincerely yours,

CRB/CAR

Cerealist in Charge.

April 21, 1921

Dr. John Coulter,
Department of Botany,
University of Chicago,
Chicago, Illinois.

Dear Doctor Coulter:

In further reference to my letter of April 19 I am sending under separate cover the manuscript mentioned. There are 21 pages of text and one photograph which may be used either as a plate or a text figure as you prefer. I trust that it will be possible to get this into the June number as the July number probably would be too late to give priority of publication. The manuscript contains one new species, four new varieties and one new combination.

Greatly appreciating your courtesy in this matter,
I am

Very sincerely yours,

CRB:NMK

Cerealist in Charge.

The University of Chicago

The Botanical Gazette

April 25, 1921.

Dr. C. R. Ball,
Bureau of Plant Industry,
Washington, D.C.

Dear Dr. Ball:

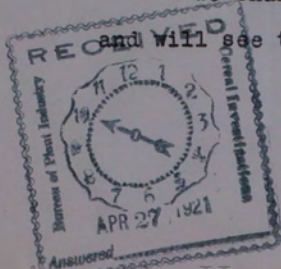
I have your letter of April 21, and the manuscript
of your article on the willows.

We shall begin the preparation of this immediately,

and will see that it appears in the June issue.

Yours sincerely,

John M. Coulter



May 24, 1921.

Professor John M. Coulter,
Hull Botanical Laboratory,
The University of Chicago,
Chicago, Illinois.

Dear Professor Coulter;

I am returning herewith galley proof of the article entitled, "Undescribed Willows of the Section Cordatae", and thank you heartily for your prompt courtesy in getting these into the June issue of the Gazette.

In estimating the number of pages this will make it seems to me probable that with the illustration included it will overrun twelve pages a few lines. If you wish to hold it within twelve page limits, and this cannot be accomplished by removing leads from part of the text, I would suggest that the next to last paragraph on Galley 4, beginning "Two specimens collected by -", be omitted, as it's omission will not detract especially from the value or completeness of the article.

I regret to find that some of the corrections necessary were due to my own carelessness incident to the hasty transmission of the manuscript.

I inclose herewith order for separates.

Very truly yours,

CRB/CAR
Incls.

Cerealist in Charge.