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5th Floor, Hunt Library
Carnegie Mellon University
4909 Frew Street
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Telephone: 412-268-2434
Email: huntinst@andrew.cmu.edu
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Hunt Institute was dedicated in 1961 as the Rachel McMasters Miller Hunt Botanical Library, an international center for bibliographical research and service in the interests of botany and horticulture, as well as a center for the study of all aspects of the history of the plant sciences. By 1971 the Library's activities had so diversified that the name was changed to Hunt Institute for Botanical Documentation. Growth in collections and research projects led to the establishment of four programmatic departments: Archives, Art, Bibliography and the Library.

Ball, Carleton R.
New varieties and combinations in *Salix*.
Jour. Wash. Acad. Sci. 28(10): 443-452. Oct. 15, 1938.

Lacks p. 1.

S. ALAXENSIS (ANDS.) COV., VAR. OBOVALIFOLIA, new var.

Shrubs, apparanetly low, 1-yr. and 2-yr. branchlets stout, 4-7 mm. thick, mostly divaricate, densely clothed with yellowish pilose hairs, becoming gray with age; stipules lanceolate, 4-10 mm. long, glandular-serrulate or -serrate, pilose; budscales 8-14 mm. long, lanceolate to ovate-lanceolate, acute, densely ~~pilose~~ pilose; leaves rather crowded on material seen, stipulate on the more vigorous shoots; petioles consisting of a broadly expanded base which forms a clasping sheath for the bud, narrowed above to join the base of the blade but may develop a true narrowed petiole above the swollen base as the leaf becomes fully developed, densely pilose throughout; blades thick and firm, 3-5 cm. long and 2.5-3.5 cm. wide as seen, obovate to oboval, apex rounded or plicately apiculate on the larger blades but subacute on the lower smaller ones (quite possibly ~~retuse to subcordate at base and subsessile short-acute at apex on vigorous shoots,~~ when fully expanded), the base cuneate on developing blades but rounded on the more oboval apical blades, densely white shining pannose-tomentose beneath, thinly gray pubescent or puberulent above, especially on the sunken midrib and laterals (probably glabrate to glabrous in maturity),

Aments (only the staminate seen) sessile on 2-yr. wood, ovate-oblong, stout, 2-3 cm. long, 1.5 cm. wide in anthesis (the pistillate probably much longer); blackish, flower scales ovate, acute, ^{blackish,} densely long-pilose with straight white hairs; stamens 2, the long slender filaments glabrous; (pistillate aments, capsules, pedicels, styles, and stigmas probably as in the species).

Folia obovalia vel obovata; petioli breves latique basi dilatata gemmam amplectante.

In the species, S. alaxensis, the leaf blades are oblanceolate, elongated, cuneate at base and tapering to an acute apex. The petiole is slender and scarcely dilated at the base. Variety obovalifolia differs from it, therefore, in the obovate-oboval blades and the broad dilated clasping petiole, enclosing the bud. The previously recognized variety, longistylis (Rydberg) Schneider, differs from the species, not in longer styles, but in the glabrous and often pruinose branchlets. The new variety differs from it, therefore, by all the differences mentioned in comparing it with the species and by the densely pillose branchlets as well.

The range of the species is from northern British Columbia to Alaska and Yukon. Variety longistylis has much the same range but probably is more common in the eastern portion of the area occupied by both. Variety obovalifolia, on the other hand, apparently is confined to the front range of the northern Rocky Mountains and the great interior basin to the eastward. This region is the meeting ground or separating area for the willows of northwestern America and those of northeastern America and Greenland. It also has some species peculiar to itself, as shown recently by Raup.

~~So much~~ Much of the material heretofore brought out of this middle ground has been collected, not by professional botanists, but ^{casually} by explorers on other missions. For these reason, many of the specimens are scanty, fragmentary, and immature or incomplete and certain identification is not fully possible. Apparently, however, the new variety ranges from eastern Jasper Park in Alberta to the western shore of Hudson Bay at Cape Eskimo, and thence northward to the Mackenzie River Valley. The following specimens are referred (some tentatively) to it. Dutilly No. 445 apparently had been browsed by animals some two years before the collections were made.

Specimens Examined

The following specimens, deposited in the herbariums designated in parentheses, have been determined to represent this species.

MACKENZIE. Near Leith Point, Great Bear Lake, Edward A. Preble 290 (USN), Aug. 31, 1903. (Leaves just expanding, the largest 3.5 cm. long, narrowly ovate, plicately apiculate at apex, the petiole short, stout, subclasping, pilose. CRB).

KEEWATIN. Baker Lake, on upper part of Chesterfield Inlet, Lat. $64^{\circ} 30'$ N., Long. 97° W., in central Keewatin, Pere A. Dutilly 444, 445 (CUA, the latter the type), Aug. 8, 1936. (Both staminate and the basis of the above description. CRB). Hudson Bay, 25 mi. south of Cape (Point) Eskimo, (in southeastern Keewatin, Lat. about 61° N.), Edward A. and Alfred E. Preble 50 (USN), Aug. 12, 1900. (A fragment with leaves just unfolding but petioles already broad and blades broadening. CRB).

ALBERTA. Jasper Park, open mountain slope just above Brule station, Wm. Spreadborough 95809a (CNM, fragment in CRB), June 24, 1918. (The available fragment is too ~~new~~ small and immature for certain determination but apparently belongs here. CRB).

SALIX CAUDATA BRYANTIANA Ball and Bracelin, n. var.

The citations given under S. caudata apply to this variety also, as far as ^{glabrous}~~pubescent~~ material occurs in the areas covered.

Variety Bryantiana differs from the species in having those vegetative organs glabrous or glabrate which are pubescent or pubescent-pilose in caudata. These organs include seasonal shoots, 1-year and 2-year branchlets, bud scales, stipules, petioles and midveins. The seasonal shoots and petioles may be puberulent when first developed but soon become glabrate. In other characters the variety does not differ consistently from the species.

Variety Bryantiana bears the same relation to S. caudata that variety vallicola bears to S. gooddingii, namely, that of a more widely-distributed and glabrous or glabrate variety in comparison with a less widely distributed and pubescent species. It is the reverse of the relationship which pubescent variety lancifolia bears to its glabrate species lasiandra, and which pubescent variety araquipa bears to its glabrate species, laevigata, so far as relative pubescence is concerned. These relationships have been discussed more fully under S. caudata. It has the same seasons of flowering and fruiting, and the same habitats, as the species, where they occur together. At the higher elevations, flowering may be somewhat later. The type specimens are C.F. Baker's No. 1151, containing both staminate and pistillate material, in the herbarium of the University of California. They were collected on June 24, 1902, in Snow Valley, Ormsby County, Nevada, at an elevation of 2400-2615 meters.

Description

A forma typica per ramellos aetatis uni aut duorum annorum, surculos ^{nuos}~~anno~~, squamas gemmarum, et stipulas aut glabros aut cito glabrescentes et per petiolos minus puberulos abludens.

This widely distributed variety has been named
It is a pleasure to name this variety in honor of Dr.

Harold C. Bryant, a graduate and former member of the faculty of the University of California, long interested in the natural history and natural resources of the State, and now Assistant Director of the National Park Service of the U.S. Department of the Interior. The 11 States in which variety Bryantiana is known to occur contain some 14 of the National Parks, and it probably will be found in most of them eventually.

Distribution

Salix caudata Bryantiana occurs along mountain streams and in meadows of the Arid Transition and Canadian Zones of the western half of the United States. It is found at elevations of 4,500 to 8,500 feet or more in the southern part of its range and at correspondingly lower elevations northward. Its range extends from central New Mexico northward to the Black Hills of South Dakota and the mountains of southern Alberta. Westward it extends across the Wahsatch System and the desert basin ranges to San Bernardino County, California and northward in and east of the Sierra-Cascade System to southern British Columbia. Apparently it does not cross and seldom enters, the Cascade Range in Oregon and Washington. It is a plant of higher altitudes than the closely related S. lasiandra and therefore does not range as far south, west, or north, as that species.

The type locality

~~S. caudata has been known so well and for so long a time in the Rocky Mountain and Great Basin, and Columbia Basin regions that it seems unnecessary to cite all the abundant herbarium material of this variety which has been examined. Accordingly, only that from California and the immediately adjacent counties in Nevada and Oregon will be listed. These specimens serve to show its rather sparse distribution in this extreme southwestern portion of its known range.~~

CALIFORNIA: San Bernardino Co.: 6 ft. high, Bear Valley, San Bernardino Mts., and their eastern base, elevation 6500 ft., S.B. Parish 3003, June 22, 1894 (SU). Tulare Co.: Soda Creek Canon near Soda Springs, head of Kern River, elev. 6500-7500 ft., W.R. Dudley 1492a, July 17, 1897 (SU). Placer Co.: Tahoe Natl. Forest, French Meadows, along Middle Fork of American River, on Sec. 16, Twp. 15 N., R. 14 E., elev. 6000 ft., L.S. Smith 1, May 22, 1931 (CRB, UC); 2 (CRB); 2626 (in part), Aug. 27, 1931, probably from same plant as No. 2 (CRB). Nevada Co.: Lower end of Donner Lake, A.A. Heller 6879, July 8, 1903 (PC). Sierra Co.: By bridge over Little Truckee River, Sierraville-Truckee Stage Road, W.R. Dudley 5524, June 12, 1900 (SU). Modoc Co.: By Parker Creek near Modoc Natl. Forest Boundary, Ferris and Duthie 188, June 14, 1919 (SU). Plumas Co.: Few shrubs, all male, east end of Bear Lake, Canadian Zone, alt. 6500 or 7000 ft., Mrs. C.M. Wilder 9331, July 10, 1912 (CRB) Siskiyou Co.: Jackson Lake, alt. 5900 ft., Annie M. Alexander and L. Kellogg 186, June 24, 1911 (UC, very immature).

The identification of the Dudley collections from Sierra Co., and of the Alexander-Kellogg specimen from Siskiyou Co., are somewhat doubtful, owing to their juvenile condition. Possibly they may represent S. lasiandra Benth.

NEVADA. Ormsby Co.: Snow Valley, alt. 2460-2615 m., C. F. Baker 1151, June 24, 1902, distributed as S. arguta var. lasiandra (Benth.) Andersson (PC, UC, sheets Nos. 75356 and 143186, each bearing staminate and pistillate types). Washoe Co.: Franktown, K. Brandegee, May, 1913 (UC).

COLORADO: Las Animas Co., Stonewall, Johnston and Hedgecock 493, June 19, 1917 (CRB). Costilla Co., Culebra Creek bottom, San Acacia, alt. 7737 ft., E. R. Warren 70, July 1, 1912 (CRB). Alamosa Co., Alamosa, South of Rio Grande River, near State St. Bridge, alt. 7536 ft., Hazel M. Schmoll 1016, 1017, June 12, 1924 (CRB). Rio Grande Co., northeast of Monte Vista, alt. 7653 ft., Schmoll 1055, 1056, June 13, 1924 (CRB). Del Norte, Ellsworth Bethel, July, 1897 (CRB). Gunnison Co., Abundant along creeks at Dayton, Ivar Tidestrom 1633, July 21, 1908 (CRB). Common at Gunnison, alt. 2300 m., Ivar Tidestrom 2235, 2236, June 14, 1909 (CRB). Fremont Co., Canon City, T.S.Brandegge, May, 1877 (UC). Pike's Peak Region: El Paso Co., Adams Crossing near Colorado City, alt. 6200 ft., I.M. Johnston 2703, (CRB, UC), 2704 (CRB) July 21, 1920. Ute Pass near Long's Ranch, alt. 7000 ft., Johnston 2705, June 17, 1920 (UC); just east of Manitou, Johnston 2706, June, 1920 (CRB, UC). Douglas Co., Lower part of Garber Creek, 8 mi. S.W. of Sedalia, Schmoll 703, June 7, 1923 (CRB). Route Co., River bank, 10-15 ft. high, Steamboat Springs, L.N.Goodding 1597, July 13, (CRB) July 20 (UC) 1903.

SOUTH DAKOTA: Pennington Co., along North Rapid Creek, 1 1/2 miles N.W. of Rochford, A.C.McIntosh 843, Aug. 24, 1926 (CRB). Lawrence Co., Stream at edge of town, Deadwood, C.R.Ball 1356, Sept. 19, 1908 (CRB).

WYOMING: Albany Co., Scarce, river bottoms, Little Laramie River, L.N.Goodding 4, June 14, 1901 (CRB). Sand Creek, 6-15 ft. high, along the creek, A. Nelson 6991, May 31, 1900 (CRB, UC). Chug Creek, common along the creek, A. Nelson 7346, June 30, 1900 (CRB). Centennial, A.Nelson 8834, June, 1902 (CRB). Stream near Centennial, Leon Kelso, 1021, 1037, June 20, 1930 (UC). Near Sheep Mtn. in a dry, hilly locality, Leon Kelso 1004, 1011, 1012, July 5, 1930 (UC). Sheridan Co., above Big Horn, Alt. 4500 ft., Pammel and Stanton 207, June 26, 1897 (CRB). Uinta Co., Fort Bridger, Aven Nelson 4596, June 8, 1898 (UC). Common along the creek, Evanston, Aven Nelson 7209, June 14, 1900 (CRB). In clumps 5-15 ft. high, Kemmerer, Aven Nelson 7179, June 13, 1900 (CRB).

MONTANA: Gallatin Co., Bozeman, J.W.Blankinship, Oct. 13, 1900 (UC). Southeast of Fair Grounds, in Swampy ground, C.R.Ball 1311, Sept. 3, 1908 (CRB). Park Co., Cottonwood Creek, northwest of Wilsall, W.N. Suksdorf 924, Sept. 2, 1921 (CRB). Co., Mountain streams, alt. 5000 ft., Deer Lodge Valley, J.W.Blankinship 788, May 27, 1906 (UC). Missoula Co., near mouth of Clearwater River, Clearwater, J.E.Kirkwood, 1435, June 9, 1923 (UC).

UTAH: Piute Co., Mt. Belknap, Marysvale, E.D.Ball 1763, June 22, 1912 (CRB). Sevier Co., head of Salina Canon, alt. 8000 ft., M.E. Jones 5427, June 15, 1894 (UC). Sanpete Co., abundant along creek near Indianola, Ivar Tidestrom 2240, June 17, 1909 (CRB). Shrub 2-3 m. high, along creek at Ephraim, Wasatch Mts. alt. 1650 m., Tidestrom 1118, June 11, 1908 (CRB). Utah Co., Along streams, Lehi, L.N.Goodding 1162, June 20, 1902 (CRB, UC). Common along stream at Thistle Junction, Wahsatch Mts., alt. 1500 m., Ivar Tidestrom 8, Aug. 8, 1907 (CRB); Tidestrom 1095, 1096, June 8, 1908 (CRB). Salt Lake Co., near Salt Lake City, Mrs. E.J.McVicker, in 1901 (UC). Dagget Co., Ditch bank, elev. 6000 ft., Louis Williams 413, May 28, 1932 (CRB); Lake shore, Green Lake, elev. 7400 ft., Williams 565, June 10, 1932 (CRB). Summit Co., near R.R.Station, Echo, Wahsatch Mts., C.R.Ball 1825, Aug. 19, 1913 (CRB). ~~John~~ Myer's Ranch, Uintah Mts., alt. 7500-8000 ft., South of Evanston, Wyo., Pammet and Blackwood 4106, July 26-Aug. 1, 1902 (CRB). Morgan Co., Peterson Canon, Peterson, alt. 8000-10,000 ft., Pammet and Blackwood 3999, July 19, 1902 (CRB). Cache Co., Ditch south of College Hill, Logan, C.R.Ball 1313, Sept. 8, 1908 (CRB). Izatt's Swamp, Greenville, Logan, C.R.Ball 1703, Sept. 27, 1910; alt. about 6000 ft., in Logan Canon, Logan, C.R.Ball 1863, Aug. 18, 1914 (CRB).

IDAHO: Bear Lake Co., Creek bank, Montpelier, J.F.Macbride 17, May 15, 1910 (UC, mixed with S. lutea). Fremont Co., Shrub 6-8 ft. high, river banks, St. Anthony, Merrill and Wilcox 820, July 4, 1901 (CRB). Bonner Co., bottoms, Upper Priest River, alt. approx. 3000 ft., C.C.Epling 8606, July, 1925 (CRB).

WASHINGTON: Klickitat Co., Open slopes near Maryhill, J.Wm. Thompson 8184, April 15, 1932 (CRB). Spokane Co., 5 or 6 miles southeast of Spangle, Wm. Suksdorf 8630, May 15, 1916 (CRB). Old bush, upper Hangman's Creek, F.A. Patty 14, May 27, 1932 (CRB, UC). Okanogan Co., Head of Ross Canyon, West of Omak, C.B. Fiker 592, April 24, 1932 (CRB); Fiker 737, May 12, 1932 (UC). On Salmon Creek near weir, Fiker 612, May 5, 1932 (CRB). On bank of Okanogan River at Omak, Fiker 614, May 5, 1932 (UC); Fiker 618 and 619 (CRB), 620 and 621 (UC), all May 8, 1932.

ALBERTA, CANADA: Elbow River at Mission Bridge, Calgary, alt. 3400 ft., Malte and Watson 116725, June 28, 1925 (CRB, NMC, UC). Sand flat along Bow River, Calgary, Malte and Watson 116728, June 4, 1925 (CRB, NMC, UC).

SALIX LASIOLEPIS SANDBERGII (Rydbergii) N. comb.

Salix Sandbergii Rydberg in Bull. Torr. Bot. Club 39: 304, 1912; - Fl. Rocky Mts. 192, 1917; - rev. ed. 192, 1922.

Salix lasiolepis, in part, of authors.

Salix lasiolepis, Bigelovii, in part, of authors.

Shrub 2-3 or sometimes 4 m. high, sprangly or divaricately branching; branchlets softly gray-tomentose, the 2-year thinly, the 1-year and seasonal shoots usually densely so, brownish or the younger yellowish; bud-scales short, stout, ovate, obtusish, 4-8 or 10 mm. long, colored and clothed as the branchlets.

Leaves petiolate, stipulate; stipules (on vigorous branchlets) reniform to semi-lunate or semi-cordate, 5-10 mm. long, denticulate to dentate, colored and clothed as the blades; petioles rather slender, 7-15 mm. long on seasonal shoots, pubescent; blades obovate or obovate-oval (on lower part of shoots) to broadly or narrowly oblanceolate or elliptical-oblanceolate or even lanceolate (on distal portions of shoots), 4-10 or more cm. long, 2-4 cm. wide, common sizes being 3 x 1.5, 4 x 2, 5-6 x 1.5-2.5, 7 x 2.5-3, 8 x 1.7 - 3.5, 9-10 x 3-4 cm., respectively, margins somewhat revolute, entire to irregularly and somewhat remotely glandular-crenulate-serrulate, or those of vigorous shoots sometimes closely crenate-dentate, the glands partly deciduous, the whitish mid-vein and slender primaries elevated on both surfaces, full green (not shining above), glaucous beneath, white-tomentose on both sides when unfolding, thinly pubescent to puberulent above and densely gray or silvery-gray pubescent beneath when full grown, sometimes becoming glabrate in autumn.

Aments midsize to large, precocious, sessile to very short-pedunculate, spreading; peduncles pubescent, 2-7 or 10 mm. long, and bearing 3-5 or rarely 7 small leaf-like bracts which are early deciduous or the distal occasionally developing into small permanent leaves; pistillate aments 3-4.5 cm. long and 1 cm. wide at anthesis, becoming 4-6.5 cm. long and 1.5 cm. wide in fruit; capsule pedicelled, lanceolate, 4.5-5.5 mm. long, brown, glabrous, the upper pedicels 1, and the lower to 2.5, mm. long, glabrous; styles entire, 0.5-0.8 mm. long, slender, glabrous, stigmas shorter, ~~whorled~~ entire or mostly divided; staminate aments 2.5-4 cm. long, 1-1.3 cm. wide, sessile but with 1-4 small bracts at base; stamens 2, filaments slender, glabrous, commonly united at base; scales of both sexes obovate, rounded to subacute at apex, black, densely pilose on both surfaces with originally-straight white hairs.

Rydberg described his Salix Sandbergii in 1912 from a single immature, leafless specimen fruiting collected in northern Idaho. For 20 years its identity remained unknown. On May 17, 1932, the writer, in company with Harold E. Parks and Joseph P. Tracy, two exceedingly observant botanists of northern California, discovered and collected a peculiar willow in a dry arroyo on Berry's Mtn., in Humboldt County. The old fruits indicated relationship with the common arroyo willow, S. lasiolepis Benthams, but it differed in many ways. In October of that year; and in April and May of 1933, a later season, Tracy collected additional good material from the same plants. The leafless flower-
spring
ing and fruiting ~~spring~~ material recalled the specimen Rydberg had described and ~~the~~ a comparison with the ~~type~~ proved the identity of the ~~the~~ plants from California and Idaho. Abundant material, collected throughout the year, proved the material to represent a well-marked variety of S. lasiolepis.

Variety Sandbergii differs from the species in the more broadly oblanceolate to obovate leaves and the much denser and more permanent pubescence of all the vegetative organs, namely, branchlets, bud scales, and leaves. From variety Bigelovii (Torrey) Bebb, it differs chiefly in the denser and more permanent tomentose pubescence just mentioned.

Variety Sandbergii is distributed at least from northern California, in both the Coast Ranges and the Sierras, across eastern Oregon and Washington and western Idaho. It has not been collected again as far north in Idaho as the type locality. The species occurs more or less sparingly throughout the same range. The variety apparently tolerates the hotter and drier situations and occupies these alone, but in more favorable situations both may occur.

The examined specimens referable to this variety are listed below, with the abbreviations of the herbariums where they are deposited. It is probable that the collecting of additional complete material may disclose the variety in localities farther south and perhaps farther east also.

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S. lasioplepis v. sandbergii

Specimens Examined

CALIFORNIA. Humboldt Co. (southern): Miranda, along South Fork of Kal River, elev. 300 ft., Jos. P. Tracy 10914 (CRB, UC), 13090 (CRB), in 1933; Bridgeville, Van Duzen River, elev. 750 ft., Tracy 10126, 11 ft. tall (CRB, UC), 10130, 20-30 ft. tall (CRB, UC), both in 1932, and 10934 and 10968 from same plant as 10127, both in 1933; dense thickets 10-20 ft. high on Van Duzen River 2 mi. west of Bridgeville, Parks and Tracy 11005, 11006, 11007 (CRB). "Blue Slide" on Van Duzen R., elev. approx. 300 ft., Tracy 10753 (CRB) in 1932 and 10931, 10969 from same plant (CRB) in 1933; Ball, Parks, and Tracy I 01236 (CRB, UC), probably from same plant as Tracy 10753, 1932. Humboldt Co. (northern): Divaricate shrubs, 6-8 ft. high, in dry ravine on west slope of Berry's Mtn., east of Redwood Creek on Trinity Highway, elev. 2500 ft., Ball, Parks, and Tracy 01323-01329, incl. USN 01323-24, May 17, 1932; Tracy 10865, 10866 (CRB, UC), 10867 (CRB), Oct. 8, 1932; Tracy 10959 (from same plant as B, P. and T 01324 and Tracy 10866) and 12184 (CRB, UC), April 2 and May 14, 1933; Tracy 10961 from same plant as Tracy 10867 (CRB), April 2, 1933. Buck Mtn., shrub 15 ft. tall on lower foothills of its northern slope, elev. about 2500 ft., Jos. P. Tracy 10243, 10244 (CRB, UC), 10248 (UC), June 9, 1932. Three Cabins, shrub 15 ft. tall, common in ravines of grassy slopes on lower western foothills of Chaparral Mtn., elev. about 1500 ft., Tracy 10356, 10357 (CRB, UC), June 19, 1932. Dobbys Creek, alt. about 500 ft., Tracy 13356 (CRB), July 9, 1934. Trinity River Valley at Willow Creek, alt. 500 ft., Tracy 9643 (UC), 12177 (CRB, UC), May 14, 1933. Nevada Co.: Dry ravine above Cass Valley, Ball 2202 (CRB), Aug. 5, 1925. Shasta Co.: Shrubs in denuded clay soil of Kennett sclector-fume area, Redding quadrangle, west of Trinity Nat. Forest. Trinity Co.: Along stream, Weaverville, E. I. Apple 7054 (CRB), April 14, 1932. Del Norte Co.: Gravel bars 5 mi. above mouth of Smith River, Tracy 9606 (CRB), May 30, 1931; Tracy 10822 (CRB, UC), Sept. 24, 1932. Siskiyou Co.: Siskiyou Mtns., sunny south slope by well, Oak Knoll Ranger Station, Klamath River, Louis C. Wheeler 3363 (CRB), Dec. 13, 1934 (apical leaves of seasons alt. 2200 ft.,

sheets still attached). Shrub to 3 m. tall, in sunny seep, Greenhorn Creek, elev. 3000 ft., Wheeler 3492 (CRB), May 12, 1935. Klamath River 6 miles below Hornbrook, L. R. Abrams 7902 (CRB), Aug. 1, 1920. Nevada Co.: Dry arroyo above Grass Valley, Ball 2302 (CRB), Aug. 5, 1925. Shasta Co.: Squaw Creek, tributary of the Sacramento R. at Kennett, elev. about 500 ft., R. Bal-laert (for C.J. Kraebel, For. Serv. erosion control), 1a to 1d incl. (CRB), Dec. 20, 1934; Shrubs in denuded clay soil of Kennett smelter-fume area, Redding quadrangle, east of Trinity Nat. For., C. J. Kraebel K501 (same plant from which cuttings 1a to 1d, above, were derived), K502, K503 (CRB), Sept. 23, 1935.

OREGON. Jackson Co.: Shrub 6-8 ft. high, by Highway 99, 5.2 mi. south of Siskiyou Pass, near Oreg.-Calif. boundary, Bertha S. and Carolyn S Ball 2334 (CRB, UC, UO), Sept. 21, 1935. Umpqua Watershed: Low shrub on West Fork of Cow Creek, Cow Creek Mtns., W.C. Cusick ~~XXXXXX~~ 4727a, 4728 (both depauperate. CRB), June 12, 1915. Deschutes Co.: Redmond, in Landes field, SE of barn, Kirk Whited (CRB), July 15, 1922; Main Ditch and Lateral C, Whited 508-68 (CRB), Sept. 3, 1922; Landes field, Whited 508-70 (CRB), Sept. 4, 1922. Wasco Co.: Dufur, L. R. Abrams 9517 (CRB), July 28-30, 1922.

WASHINGTON. Klickitat Co.: In the canyon north of Bingen, W. N. Sukendorf 10342, 10372 (CRB), April and July, 1920. Maryhill, open slopes near, J. Wm. Thompson 8183 (CRB), April 15, 1932. Chelan Co.: Moist creek bottom near foot of Blewett Pass, J. Wm. Thompson 6022 (CRB), April 18, 1931.

IDAHO. Boise Co.: Squaw (Sweet) Creek, stream banks, elev. 3500 ft., J. T. Macbride 859 (as S. Wolfii idahoensis Ball, USN), May 11, 1911. Elmore Co.: On banks of Canyon Creek, near Telligate, north of Mountain Home, J. H. Christ and W.W. Ward 7028 (CRB), May 7, 1937. Gem Co.: In ravine in basalt cliffs, Black Canyon Diversion Dam, Emmett, Christ and Ward 6979, 6980 (CRB), May 3, 1937. Nez Perce Co.: Along Hatwai Creek, Sandberg, MacDougal, and Heller 71 (CRB, USN, isotype), April 28, 1932.

S. padifolia Rydberg, in Bull. Torr. Bot. Club 28:272-73. 1901, not
Andersson, 1858. S. ~~pma~~ padophylla Rydberg, nomen novum, in Bull. Torr. Bot.
Club 28:499, 1901.

Rydberg's original description read as follows: ~~XXXX~~ A shrub 1-7 m. high,
with light brown smooth bark. Young twigs strict, glabrous and shining, yellow,
or often brown or purple: stipules ovate or rounded, glandular-dentate:
leaves with petioles 5-8 mm. long; blade oval or broadly elliptic, crenate,
short-acute or obtusish, rounded at the base, 3-5 cm. long, 1.5-2 cm. wide,
when young sparingly covered with silky hairs but soon glabrate, dark green
above, paler beneath: pistillate aments 3-4 cm. long, densely flowered, appearing
usually before the leaves, borne on very short branches and subtended by
1-4 small leaves: bracts obovate, fuscous, covered on the outside with white
wool: pistils nearly sessile, glabrous; style about 1.5 mm. long: stigmas 2,
nearly 1 mm. long, 2-cleft: capsules ovate-conic, about 6 mm. long: staminate
aments almost sessile, 2-3 cm. long, 10-12 mm. ~~wide~~ in diameter: bracts as those
of the pistillate aments: stamens 2, filaments glabrous."

With some exceptions to be noted later, this is a fairly complete description
of the plant Rydberg had in hand. His species, however, received scant
attention then or since. The reasons were two. In the first place, he compared
it only with S. mackenziana and S. ~~maritima~~ cordata, two species of the
Section Cordatae. He made no mention of the Section Commutatae, to which the
broad and short leaves and the elongated style and stigmas clearly showed it to
belong, as did also some other characters and the general habit and habitat.
He did not compare it with, or even mention, Salix monticola Bebb, the common
and well known representative of the Commutatae in the southern Rocky Mountains
where his species occurred. In the second place, the other three species of
Salix published in the same paper were speedily shown to be either ^{previously described} ~~antedated~~ or
of doubtful validity and these facts tended to discredit the standing of the
plant under discussion. So also did the fact that the original name was pre-
occupied and had to be replaced *by him*.

47 2 - *S. pseudo-monticola* var. *padophylla*

In the light of more abundant material, Rydberg's description needs some emendation. The branchlets often are not strict but more or less divaricate, as in the species or in *S. monticola* Bebb. The leaves he described were those of flowering and fruiting branches. Mature leaves on such branches, and the full-grown leaves of seasonal shoots, probably will be larger, more produced at apex, and sometimes subcordate at base. Unfortunately, no collector seems to have collected all the stages of development from the same plant. Numerous specimens of mature foliage are found in herbariums but which ^{one} actually represent the variety and which the species cannot be known with certainty until complete specimens are available.

The description of the leaves as merely "paler beneath" rather than glaucous beneath probably was due partly to the immaturity of the material and perhaps partly to faulty drying. Too rapid drying, especially by electric driers, often destroys the glaucous character. The aments are sessile to very short-peduncled at anthesis and the peduncle elongates thereafter. The staminate aments remain subsessile. The pedicels of the capsules vary from 0.5 to 1 or 1.5 mm., especially the lower, and are not "nearly sessile" as described.

(Ball Carleton R. New Varieties and Combinations
in Salix. Jour. Wash. Acad. Sci. 28: 450-453.
Oct 15, 1938.

Variety padophylla differs from the species, pseudo-monticola Ball, chiefly in having the aments borne on short leafy peduncles, whereas those of the species are sessile and scarcely even bracted at base. From S. monticola Bebb it differs in the pedunculate aments and also in the oval-ovate leaves, resembling those of the apple, as the name indicates. The leaves of monticola are lanceolate to broadly lanceolate-oblong and acute to subacuminate.

S. Barclayi Andersson, also of the Section Commutatae, likewise has leafy-pedunculate aments. In general, however, the peduncles are much longer and more leafy. The branchlets usually are more or less hirsute and the leaves are oblanceolate, acute at the apex, and usually narrowed at base, and commonly closely glandular-grenulate on the margins. The flower scales also are longer, narrower, and acute, with longer pilose hairs. Unfortunately, however, S. Barclayi, in its most southward extension, tends to become more glabrate, the peduncles become reduced in length, and at least the lower (distal) leaves may be broadened at the base. Only the collection of complete specimens (flowers, fruit, and mature leaves from fruiting branchlets, and mature seasonal shoots) will enable the final solution of this problem.

error in print
The widespread and discriminating observations and collecting of Professor Edward C. Smith of the ^{E. Smith} Department of Botany, Colorado Agricultural College, is producing information and material of much value in the solution of this and other problems of the Colorado willows. He recently has raised the question of the taxonomic status of the representatives of the Commutatae in that State and this contribution is a partial answer to the question. More complete collecting may make a complete answer possible.

Immature material is difficult to distinguish from immature specimens of the present variety of pseudo-monticola.

~~SPECIMENS EXAMINED~~ Specimens Examined

The following flowering and fruiting specimens are referred to this variety. It is probable that some of the mature-foliage specimens now assigned to *S. pseudo-monticola* really belong to the variety but this can be determined only after flowering, fruiting, and late foliage specimens from the same plant are available for study.

ARIZONA (east central): White Mtns., south of Thomas Peak, Coville 2009 (USN), July 2, 1904.

COLORADO (western): Gunnison Co.: Vicinity of Mt. Carbon, elev. 2750 m., Eggleston 5671 (USN), June 11, 1910. Hinsdale Co. (Gunnison Watershed): Carson, elev. 11,000 ft., Baker 306 (USN), July 2, 1901. Monterey or La Plata Co.: Bob Creek, West La Plata Mtns., Baker elev. 10,000 ft., Baker, Earle, and Tracy 175 (USN, cited by Rydberg), June 28, 1898. Chaffee Co.: Busha Vista, Eastwood 7071 (USN), June 18, 1918.

COLORADO (eastern): Conejos Co.: Los Pinos, elev. 7000 ft., Baker 271 (USN, cited by Rydberg), May, 18 99. El Paso Co.: Zanger Farm, Black Squirrel Creek, Christ 1955 (CRB), May 5, 1936. Pikes Peak Region, just east of Manitou, Johnston 2765 (CRB), June, 1920; Mimahaha, Pikes Peak, Johnston 2713 (CRB), June 2, 1920; Cog Road, Pikes Peak, Christ 168 (CRB), June 6, 1935. Grand Co.: Grand Lake, E. C. Smith (CRB), June 6, 1934. Larimer Co.: Estes Park, elev. 7500 ft., E. C. Smith 446, 451 (CRB), June 11, 1934. Teller Co.: Divide, Christ 205, 203 (CRB), June 9, 1935; North Branch of Catamount Creek, elev. 9400 ft., E. R. Warren 9 (CRB), Sept. XXIX 2, 1926.

Lake Co.: Leadville, Eastwood 7143, 7144, 7154 (USN), June 19, 1918.

San Juan

Co.: Silverton, alt. 10,000 ft., Tweedy 268, 269 (USN, 268 doubtfully cited by Rydberg), July, 1895.

WYOMING. Albany Co.: Shrubs 3-8 ft. high, along stream, Nash's Fork, A, Nelson 7781, 7782 (CRB), July 28, 1900. Centennial, in bog, Nelson 8623 (CRB), Aug. 7, 1902.

Extension Service, U.S.D.A.

July 15, 1938

Dr. Eben H. Toole,
Editor for Botany, Journal
Washington Academy Sciences,
Seed Investigations, B.P. L.

Dear Dr. Toole:

I am inclosing a paper entitled "New Varieties and Combinations in Salix", which I will be glad to have published in the Journal of the Washington Academy if it can be accepted for such publication.

Cordially Yours,

Carleton R. Ball
Executive Secretary

Address:

Extension Service, U. S. Dept. Agric.

September 23, 1938

Dr. Eben H. Toole,
Seed Investigations, B. P.I.

Dear Dr. Toole:

I am returning the proof of my Salix paper of the Journal of the Washington Academy. I am gratified at then prompt work on it.

There are numerous corrections necessary. Many of them obviously are caused by editorial changes. As you did not return the manuscript with the proof, I am not sure in every case whether the error was mine, the compositors', or the editors'.

I wish the word "herbariums" retained as I had it. When we adopt a noun into English from the Latin or Greek we are under no compulsion to maintain the foreign plurals. Ordinary English plurals are perfectly proper. To insist on the foreign plurals puts an extra burden on American children, already overloaded in school. It also gives rise to ridiculous errors, such as the ever-increasing use of the plural "data" as a singular noun in address and publication. I attach a paper I wrote on this subject and will be glad to have you bring it to the attention of the editor who worked on my manuscript.

Cordially Yours,

Carleton R. Ball