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About the Institute

The Hunt Institute for Botanical Documentation, a research division of Carnegie Mellon University, specializes in the history of botany and all aspects of plant science and serves the international scientific community through research and documentation. To this end, the Institute acquires and maintains authoritative collections of books, plant images, manuscripts, portraits and data files, and provides publications and other modes of information service. The Institute meets the reference needs of botanists, biologists, historians, conservationists, librarians, bibliographers and the public at large, especially those concerned with any aspect of the North American flora.

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.

1. *Salix lucida* Muhl. Shining Willow. (7)

Shrub or small tree 4-6 or more m. high; bark brown, glabrous; twigs and bud-scales chestnut-brown, shining, glabrous (see var.); stipules reniform, to semilunate, 2-5 mm. long; leaves large (see var.), lanceolate to ovate-lanceolate, 5-12 or 15 cm. long, 2-5 cm. wide, or rarely up to 20 by 8 cm., narrowed to rounded or cordate at base, mostly long-acuminate, sharply glandular-serrulate, glabrous (see var.), shining green above, paler green beneath, petioles stoutish, 3-10 or 15 mm. long, glandular above near leaf-base; aments ^{stout,} obovate or oval, 2-6 or 7 cm. long, on lateral leafy peduncles 1-2 cm. long; scales oblong or oval, obtuse, entire or erose at apex, yellow, thinly pilose, deciduous; stamens 3-5 or more, filaments free, pubescent below; capsules lanceolate, 4.5-6.5 mm. long, glabrous, brownish; pedicels 0.5-1 mm. long; styles about 0.5 mm. long; stigmas short, thick.

Along streams and lakes, and in swamps, from Del. west to northern W. Va. and central Ohio and northwestward to northern Ia. and north-central N.D.; north to Newfoundland and Lab., and west, at about 54° N. to east-central Sask. Outlying stations ^{are} in Roanoke Co., Va., and at Weeping Water, ^Nebr. In Ohio, it occurs sparingly in the central third (east-west), and more commonly in the northern third.

1, a. *S. lucida* var. *angustifolia* Andersson has shorter, narrowly lanceolate leaves. It occurs sparingly in the northern part of the species range. It has not yet been reported from Ohio or closely adjacent Michigan.

1, b. *S. lucida*, var. *intensa* Fernald has the young twigs and bud-scales, and the lower surfaces of young leaves more or less hairy. It occurs with the species but most commonly northward. It has been found in Catawba Id., Ottawa Co., ⁱⁿ Ohio.

2. Salix serissima (Bailey) Fernald. Autumn Willow. Fig. --

S. lucida serissima Bailey, in Arthur, Bull. Geol. Surv. Minn. 3:19. 1887.

S. serissima (Bailey) Fernald, Rhodora 6:6. 1893.

A shrub 3°-12° high, with olive-brown, shining branches and yellowish-brown, glabrous, shining branchlets and bud scales; Leaves lanceolate to elliptic-lanceolate or oblong-lanceolate, narrowed to rounded at base, acute to short-acuminate at apex, finely glandular-serrulate, 2'-3' or 4' long, $\frac{1}{2}$ '-1' or $1\frac{1}{2}$ ' wide, glabrous, green and shining above, subglaucous beneath; petioles slender, glandular above at outer end, stipules none. Aments serotinous, short and stout, oblong to oblong-oval, the staminate $\frac{1}{2}$ '-3/4', the pistillate 1'-1 $\frac{1}{2}$ ' long and 3/4' wide in fruit, on lateral leafy branchlets 4''-16'' long; scales obovate, pale yellow, white-pilose, deciduous; stamens 3-5 or more, filaments free, thinly pilose; capsules narrowly conical, glabrous, 4''-6'' long, thick-walled, brown; styles 1/6'' long, stigmas very short, divided; pedicels stout, $\frac{1}{2}$ '-1'' long.

In swamps and bogs from northern New Jersey to Newfoundland, west to ne. Ind., cent. Minn., ne.-cent. N.D., and Nw. Mont, and northward to ne. Alta., with discontinuous extension to the Black Hills of S.D., and Longs Peak in ne. Colo. June-Oct.

Salix pentandra L., the Bay-Leaved Willow, an introduced ornamental tree with ovate leaves, shining above and paler to glaucescent beneath, is a rare escape northward.

(3)

6. *Salix caroliniana* Michx. Carolina Willow, Ward's Willow.

Fl.

Shrub or tree to 10 m. high in our area, larger westward; bark grayish; branchlets branchlets, bud scales, and short petioles yellowish to dark brown, the seasonal thinly to densely white-pubescent; stipules large, ~~7~~ 7-15 mm. long, broadly reniform, obtuse to acutish or acute, serrulate, white beneath; leaves linear-lanceolate to lanceolate, (the young often oblanceolate, and obtuse), 7-12 or 15 cm. long, 1-3 cm. wide, acutish or rounded at base, tapering gradually to a long-acuminate point, closely and shallowly serrulate, dark green above, densely white-glaucous beneath, often somewhat pubescent, especially on midribs; vein islets very small beneath; aments coetaneous, slender, lax, 3-11 cm. long, 8-14 mm. wide, on peduncles 2-5 or 7 cm. long, bearing 3-5 small leaves; scales oblanceolate to obovate villous, yellowish, deciduous; stamens 4-8, filaments free, pubescent at base; capsules narrowly ovoid-lanceolate, 3-5.5 mm. long; pedicels 1.5-3 mm. long, styles 0.1-0.2 mm. long, stigmas minute.

w. to

Rocky soil along watercourses, Potomac and Ohio Valleys (n. to Pittsburg), s. Ind.,

Mo., Okla., and W. Texas, s. to the Gulf and Cuba. Late April-May in our area.

[*S. ambigua*, Small; *S. longipes*, Small; *S. longipes* var. *Wardii*, Peck; *S. Wardii*, B. & Gray.]

The northern and western plants, segregated as ~~*S. longipes*~~ var. *Wardii* by blunter stipules and shorter pedicels, intergrade completely with southeastern plants.

ne. Kan. (Geary Co.),

The terminal pistillate ament sometimes becoming lateral through the development of a leafy shoot from the axillary bud of the uppermost peduncular leaf.

(4) *Salix amygdaloides* Andersson. Peach-leaf Willow.

Shrub or tree, 3-12 m. high, with 1-3 often leaning trunks to 1-4 dm. in diameter, color-affect yellowish-green; trunk bark fissured, dark- or yellowish-brown, branches gray-brown; twigs yellow to reddish-brown, not brittle, somewhat dropping at tip, glabrous; bud scales 2-5 mm. long, yellowish, glabrous; stipules often wanting, or semi-ovate, subreniform, or ~~sub~~ semi-lunate, 3-8 or 12 mm. long; leaves lanceolate to ovate-lanceolate, 5-10 or 12 cm. long, 1.2-3 cm. wide, scurish to mostly rounded at base, acuminate at apex, closely serrulate, glabrous, yellowish-green above, glaucous and with tiny vein islets beneath, petioles slender, 6-20 mm. long, often twisted, glabrous, yellowish; aments costaneous, linear, lax, 2.5-5 or 7 cm. long, , on leafy peduncles 1-3 or 4 cm. long; scales yellow, lanceolate or broader, mm. long, glabrate outside, villous within, deciduous; stamens 4-7, filaments free, hairy below; capsule lanceolate, 4-5 mm. long, yellowish, glabrous; pedicels slender, 2 mm. long, styles 0.3-0.5 mm. long, stigmas shorter. April-June.

Alluvial soils, usually near water, northeast N.Y. and adjacent Que. west to south-east B.C. (to 53° N. in east Sask.), south (east of Cascade Mtns.) to Ariz., Tex., Ky., and Pa.

(5)

(11)

9. *Salix nigra* Marshall.

Black Willow.

Shrub or tree to 20 m. or more in height, with 1-4 often leaning trunks to 5 dm. in diameter, and blackish bark; twigs slender, yellowish-brown to dark-brown, often pubescent while young; stipules ~~markedly cordate~~ semi-cordate, acute, serrulate, minute to 12 mm. long; leaves linear-lanceolate to narrowly lanceolate, 6-10 or 12 cm. long, 1-1.5 or 2 cm. wide, acutish to mostly rounded at base, long-acuminate at apex, often falcate, dark green above, paler green beneath, with tiny vein islets, finely serrulate, the upturned lateral veins forming a continuous marginal vein, often pubescent while young, petioles 4-10 mm. long, usually pubescent; anthers coesaneous, slender, lax, 2.5-7 cm. long, 8-12 mm. wide, on leafy peduncles 1-3 cm. long; scales obovate, yellowish, villous, deciduous; stamens 3-7, filaments free, pubescent below; capsules ovate-conic, 3-5 mm. long, brown, glabrous, pedicels 1-2 mm. long, styles and stigmas about 0.2 mm. long. April-May in its northern range.

Abundant in alluvial soils along streams and in meadows, Fla. west to West Texas, north to southern parts of N.B., Que., and Ont., east-central Minn., and southwest to east-central Nebr. and West Texas. In Ohio, it occurs throughout the State and has been reported from most of the counties.

- 9 -

(12)

4. *Salix fragilis* L. Crack Willow, Brittle Willow.

Large tree to 20 m. high and sometimes 1 m. in diameter; twigs greenish to dark red, glabrous, very brittle at base and deciduous in winds; stipules wanting, or small, semicordate, and early deciduous; leaves narrowly lanceolate to lanceolate, 7-12 or 15 cm. long, 2-3.5 cm. wide, mostly acute but sometimes bluntish to rounded at base, long-acuminate at apex, glandular serrations 5-6 per cm., glaucescent to glaucous beneath,* glabrous at maturity but often thinly hairy while young, petioles 7-15 mm. long, glandular above near leaf base; aments costaneous, slender, lax, 3-8 cm. long, 8-10 mm. wide, on leafy peduncles 1-3 or 5 cm. long, bearing 2-5 small leaves; flower scales oblong, greenish-yellow, crisp-villous, deciduous; stamens mostly 3-4, rarely 2, filaments free, hairy below; capsules narrowly conic, 4-5.5 mm. long, glabrous, pedicels 0.5-1 mm. long, styles 0.3-0.7 mm. long, stigmas short, notched. April-May.

Introduced from Europe in colonial times for ornament, sentiment, shade, and gunpowder-charcoal, and carried steadily westward by settlers. Common in farm yards, pastures, and parks in the east and often escaped; less common westward. Hybridizes commonly with *Salix alba* and sometimes with several other species. Many of the introductions from Europe already were hybrids and some of them have hybridized again here. This accounts for the great diversity found in herbarium and living material. While not widely collected, the Crack Willow may be looked for throughout Ohio.

* Not "green both sides", as keyed and described by Fernald in Gray's Manual, ed. 8. 1950.

5. *Salix alba* L. White Willow.

Large tree to 20 m. high; twigs greenish or yellowish, pubescent, not brittle; stipules minute and deciduous, or wanting; leaves ~~of~~ narrowly lanceolate to lanceolate, 4-8 or 10 cm. long, 1-2.5 cm. wide, acutish or rounded at base, acuminate at apex, glandular serrations 9-10 per cm., glaucous beneath, more or less silvery silky on both sides but especially below, or rarely densely hairy on both sides, petioles glandless, or those on vigorous shoots glandular above near the leaf base; aments costaneous, slender, 3-5 or 6 cm. long, 7-9 mm. wide, on peduncles 1-4 cm. long, with 2-4 small leaves; flower scales as in *S. fragilis*; capsules ovoid-conic, 3-4.5 mm. long, glabrous, sessile or subsessile; styles 0.2-0.4 mm. long, stigmas short. April-May.

Introduced from Europe in colonial times for the same purposes as *S. fragilis*, and also for basketry and medicinal use. Commonly planted and sparingly escaped in the Eastern States and adjacent Canada, and occurs less abundantly westward. As noted, it hybridizes freely with *S. fragilis*, and less frequently with some other species.

A few varieties have been described. Two so-called varieties, the abundant var. *vitellina* (L.) Stokes, and the rare var. *calva* G. F. W. Meyer, included by Fernald, seem to represent hybrids with *S. fragilis* and both are less hairy than *S. alba* typica. A third variety is much more hairy than typical *S. alba* and is presented below. It is sparingly cultivated for ornamental purposes and has rarely escaped. It has not been reported from Ohio.

Leaves thinly silvery silky above, more densely so beneath. *S. alba* typica.

Leaves densely and beautifully silvery silky on both sides. var. *argentea* Wimmer.

stamens 2-4, rarely 2, commonly 3-4,
filaments free, hairy below;

(8)

Salix fragilis (14)

6. *Salix babylonica* L. Weeping Willow.

Introduced tree, to 12 m. high; branchlets and twigs slender, elongated, pendulous, yellowish to brownish, glabrous; stipules mostly wanting, or lanceolate, 2-7 mm. long; leaves linear-lanceolate to lanceolate, acute or somewhat broadened at base, ^{narrowly} long-acuminate at apex, mostly falcate, 6-12 cm. long, 0.5-1.5 or 2 cm. wide, finely but unevenly spinulose serrulate, yellowish-green above, glaucescent to glaucous beneath, glabrous, petioles slender, 3-7 mm. long, or to 10 mm. on vigorous shoots, sparingly glandular above near leaf base; aments oostaneous, very small, 1-2.5 or staminate to 4 cm. long, 6-8 mm. wide, on peduncles 0.5-1.5 cm. long and bearing 2-4 scales narrow, pale yellow, crinkly-pubescent, deciduous; tiny leaves; [^]stamens 2 to 3 or 4, apparently mostly 2, filaments free, pubescent at base; capsules tiny, narrowly ovoid, 1.5-2.5 mm. long, sessile, glabrous, styles almost obsolete, stigmas minute. April-May.

Introduced from Europe in colonial times, for use in cemeteries as an expression of mourning and in home yards as an ornamental; now widely distributed and occasionally escaping. Staminate plants are relatively rare in America. It hybridizes with *S. alba* and less commonly with *S. fragilis*.

Salix babylonica is native to north China and does not occur in the Euphrates Valley. The specific name, *babylonica*, therefore is inappropriate, and the common name, Babylon Weeping Willow, is incorrect. The tree was introduced into Europe many centuries ago and developed there into its present ornamental "weeping" form. It became widely grown there as a "mourning" tree (see Shakespeare). Later, it was given the name *babylonica* by Linne, apparently under the mistaken impression that it was the "willow" mentioned in Psalm 137.

There has been much diversity of opinion as to whether the number of stamens was only 2, or more than 2, as in *S. alba* and *S. fragilis*. Only a study of material from China can determine the facts. Staminate plants are rare in America, and the presence of more than two stamens occasionally may have resulted from hybridization with these other species, here or in Europe. The Chinese plant is scarcely "weeping".

9 15
(10.) *Salix interior* Rowlee. Sandbar Willow. Long-leaved Willow.

- S. fluviatilis* Nuttall, of eastern authors, not Nuttall.
S. longifolia Muhlenberg.

Many-stemmed shrub 2-5 m. high, 2-6 or rarely 10 dm in diameter; twigs slender, leafy, reddish-brown, usually glabrous; stipules none; leaves linear, broadly linear, linear-oblong, or rarely oblong, acute to acuminate at both ends, almost sessile, 3-10 or 15 cm. long, 3-12 or 20 mm. wide, remotely and irregularly spinulose-denticulate, green on both sides but paler beneath, often sericeous beneath while young, glabrous or rarely pubescent in age; aments serotinous, 3-6 or 8 cm. long, 8-16 mm. wide, lax, 1-3 or 5 together, terminating lateral leafy twigs 3-10 cm. long; scales lanceolate, yellowish, thinly pubescent, deciduous; stamens 2, filaments free, pubescent at base; ovaries often densely to thinly silvery-villous, capsules narrowly lanceolate, 7-10 mm. long, glabrous; pedicels 0.5-1.5 mm. long; styles almost obsolete; stigmas, short, divided. April-July or later, as the successively lower aments in a cluster often develop later.

Var. west to Ky., thence south to mouth of Mississippi R. and the lower Rio Grande Valley, and west to the western edge of the Great Plains in U.S. and southern Can.; north to N.B. and Que. and northwest to James Bay, Mack., Yukon, and Alaska.

Three varieties are recognized and are keyed out below:

- A. Leaves linear to linear-oblong, 5-15 cm. long; glabrous in age.
a. Leaves 5-12 or 18 mm. wide var. *typica typica*
b. leaves 3-6 mm. wide (not occurring in Ohio) var. *pedicellata* (Anderson) Ball
B. Leaves narrowly to broadly oblong var. *Wheeleri*

10 a. var. *Wheeleri* Rowlee (*Salix Wheeleri* (Rowlee) Rydberg.

Leaves short and broad, 3-6 or rarely 10 cm. long, 1-1.4 or 1.8 cm. wide, usually more densely and more permanently pubescent. With the species, especially in sandy situations, in the central portion of the north-south species range. Flowering average later.

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9. *Salix interior* Rowlee. Sandbar Willow, Longleaf Willow.

Many-stemmed shrubs, 2-4 or 5. m. high, 2-6 or rarely 10 cm. in basal diam.; bark gray; branchlets slender, ascending, leafy, reddish-brown, usually glabrous; stipules none; leaves linear, oblinear, or ~~oblong-linear~~ broadly linear, acute to acuminate at both ends, almost sessile, 5-12 or 14 cm. long, 5-12 or 18 mm. wide, ~~more or less~~ remotely and irregularly spinulose-denticulate, green on both surfaces but paler beneath, often silvery-villous when young, glabrous in age; aments serotinous, slender, lax, 3-6 or 8 cm. long, 8-16 mm. wide, 1-3 together terminating lateral leafy twigs 3-10 cm. long; scales lanceolate, thinly pubescent, yellowish, deciduous; stamens 2, filaments free, pubescent at base; ovaries often thinly to densely silvery-villous, capsules narrowly lanceolate, 7-10 mm. long, glabrous; pedicels 0.5-1.5 mm. long; styles almost obsolete, stigmas short, divided.

Common on sandbars, mudbars, and moist alluvial soil. N.B. and s. Que. nw. to Mack., Yukon, & Alaska (Yukon Valley), s. to Pa., W.Va., & Ky. thence to mouth of Miss an outlying station in Va. at D.C. R. and lower Rio Grande, w. to the edge of the Great Plains in U.S. & s. Can. ^{Late-Apr} ~~May~~, sometimes flowering again in midsummer. [*S. fluviatilis*, B. & E.; *S. longifolia*, Gray]. ~~In the western part of our area, var. pedicellata (Anderss.) Ball, with leaves only 2-6 mm. wide, appears and becomes the most common form in the~~

9a. *S. interior* var. *pedicellata* (Anderss.) Ball. Leaves only 3-6 mm. wide, often with longer denticulations. Rare in western part of our area, increasingly common in the Great Plains Area. (*S. linearifolia*, Rydberg, excl. synonyms).

9b. *S. interior* var. *Wheeleri* Rowlee. Leaves short and broad, 3-5 or 7 cm. long, 1-1.4 or 1.8 cm. wide, usually more densely and/permanently pubescent. With the spec- ies, especially in sandy situations, as river shores, around the Great Lakes, and in western sandhills.

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9. *Salix interior* Rowles. Sandbar Willow, Longleaf Willow.

Many-stemmed shrubs, 2-4 or 5. m. high, 2-6 or rarely 10 cm. in basal diam.; bark gray; branchlets slender, ^{orange} ascending, leafy, reddish-brown, usually glabrous; stipules none; leaves linear, oblinear, or ~~oblong-linear~~ broadly linear, acute to acuminate at both ends, almost sessile, 5-12 or 14 cm. long, 5-12 or 18 mm. wide, ^{above} ~~short-sessile~~ remotely and irregularly spinulose-denticulate, green on both surfaces but paler beneath, often silvery-villous when young, glabrous in age; anthers serotinous, slender, lax, 3-6 or 8 cm. long, 8-16 mm. wide, 1-3 together terminating lateral leafy twigs 3-10 cm. long; scales lanceolate, thinly pubescent, yellowish, deciduous; stamens 2, filaments free, pubescent at base; ovaries often thinly to densely silvery-villous, capsules narrowly lanceolate, 7-10 mm. long, glabrous; pedicels 0.5-1.5 mm. long; styles almost obsolete, stigmas short, divided.

Common on sandbars, mudbars, and moist alluvial soil. N.B. and s. Quebec to Mack., Yukon, & Alaska (Yukon Valley), s. to Pa., W. Va., & Ky. thence to mouth of Miss. ^{an outlying station in Va. at D.C.)} R. and lower Rio Grande, w. to the edge of the Great Plains in U.S. & s. Can. ^{Late-April-May, sometimes flowering again in midsummer.} [*S. fluviatilis*, B. & B.; *S. longifolia*, Gray]. ~~In the western part of our area, var. *pedicellata* (Anderss.) Ball, with leaves only 3-6 mm. wide, appears and becomes the most common form in the~~

9a. *S. interior* var. *pedicellata* (Anderss.) Ball. Leaves only 3-6 mm. wide, often with longer denticulations. Rare in western part of our area, increasingly common in the Great Plains Area. [*S. linearifolia*, Rydberg, excl. ^{finch} synonymy].

9b. *S. interior* var. *Wheeleri* Rowles. Leaves short and broad, 3-5 or 7 cm. long, ^{more} 1-1.4 or 1.8 cm. wide, usually more densely and/permanently pubescent. With the species, especially in sandy situations, as river shores, around the Great Lakes, and in western sandhills. (*S. wheeleri*, Rydberg, B + B.)

DISTRIBUTION. The sandbar willow ranges from Quebec, New Brunswick and New Hampshire south to Delaware, the District of Columbia and the Ohio Valley, thence south to ^{Miss and} southern Louisiana and west, in one or another of its varieties, over most of the Great Plains area, and north to Alaska, Yukon, Mackenzie, and Ontario. It is very abundant in the Mississippi Valley.

In Indiana it is found throughout the State, from the beach sands of Lake Michigan to the rich alluvium of the Ohio River. It occurs along ditches and lake margins and on the flood plains of streams, being confined chiefly to lands which are subject to overflow at some time in the year.

A form with very narrow leaves, only 3 to 6 mm. wide, and frequently with longer marginal teeth, also occurs throughout the State with the species, with which it intergrades. It has nearly the range of the species in the eastern United States and is especially abundant in the Mississippi Valley, in the broad sense. In leafshape it is very similar to the western variety angustissima Anderss.

REMARKS. This willow takes its name from the fact that it occurs commonly on sandbars and mudbars in streams and is one of the first plants to occupy new-made bars. It has no economic importance except as a binder of stream margins and bars and a shrubby livener of treeless landscapes in the Great Plains area.

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10. *Salix rigida* Muhl. Cordate or Heart-Leafed Willow.

Several-stemmed shrub 2-4 or 6 m. high; branchlets, bud scales, and petioles yellowish to dark brown, the younger pubescent to puberulent; petioles 5-10 or 14 mm. long; stipules common, subreniform, semi-cordate, or roundish, mostly acute, ^{ovate} blades narrowly ^{5-10 or 15 mm. long;} broadly lanceolate, or somewhat oblanceolate (broadest just above the middle), 7-12 or 15 cm. long, 1.5-3 or 4 cm. wide, rounded or subcordate at base, mostly short-acuminate at apex, closely glandular-serrate, dark green above, glaucescent to glaucous beneath, younger somewhat pubescent, especially on veins, becoming glabrate or glabrous, rigid and strongly veined in age; aments subprecocious to subcoetaneous, 2-5 cm. long 8-14 mm. wide, subsessile or on bracted peduncles 3-10 mm. long; scales lanceolate-oblong or oblanceolate, dark brown, 1-1.5 mm. long, acute or obtuse, crinkly-pilose, persistent; stamens 2, filaments free or sometimes united at base; capsules lanceolate from a subovoid base, 4.5-6 mm. long, greenish or reddish-green, glabrous; pedicels 1-1.5 mm. long, glabrous; styles mostly 0.5 mm. long, entire; stigmas 0.3 mm. long, entire or divided.

Stream banks, ditches, and mostly low grounds. N.B., N.S., and s. Que., w. to e. Sask. (to lat. 53°) and ne. Mont., s. to Del., Va., Ky., Mo., and nw. Nebr., with ^{James Bar} outlying stations in n. & s. Ala. and nw. Ark. Late-April-June. [*S. cordata* Muhl. (not M₁chx.), B. & B., Gray, Rydb., Small (in part); *S. missouriensis*, ~~S. B.~~, Gray, Rydb.]

The typical broad-leafed form is most common eastward. The form with narrowly-lanceolate leaves, more common westward, has been segregated as var. *angustata* Andersson. The form with longer, more densely glaucous leaves and more densely white-pubescent branchlets, abundant in the lower Missouri and adjacent Mississippi Valleys, has been recognized as var. *vestita* Anderss. [*S. missouriensis* ~~Gray~~ Gray, Rydb.]

and occurring sparingly eastward

I. F. copy

11. *Salix myrtillofolia* Andersson. Myrtle-Leafed Willow.

Depressed, ascending, or suberect, much-branched leafy shrub, 2-7 or 10 dm. high; young twigs yellowish, more or less pubescent; older brownish, glabrate-glabrous; stipules small, often wanting; blades broadly oblanceolate, obovate, or broadly elliptical, 2-4 or 6 cm. long, 1-3 cm. wide, acutish to rounded at base, acute or obtusish at apex, finely crenulate-serrulate, green, glabrous, and reticulate on both sides, rather thin, often blackening in drying; petioles slender, 4-8 mm. long; aments coetaneous, staminate 1-2, pistillate 1.5-3 cm. long, on leafy-bracted peduncles $\pm$ 5-12 mm. long; scales oblong-oblanceolate to oblanceolate, ^{acutish,} brown, 1-1.5 mm. long, glabrate outside; stamens 2, filaments free, glabrous; capsules brown, glabrous, 4.5-6.5 mm. long; pedicels 1-1.5 mm. long; styles 0.5-0.8 ~~or~~ 1 mm. long; stigmas shorter; gland ventral, short.

Moist to wet or swampy ground. Nf. and s. Que. (Gaspé Penin.) w. in Can. to s. Alta. and nw. to James Bay, n. Sask., Mack., and Alaska. Var. brachypoda Fernald, differing in leaves glaucous beneath, scales blackish, and capsules sessile, occurs from Nf. nw. to s. tip of James Bay, Jasper Park, Alta., and Alaska. ~~It may well be found in the Gaspé Peninsula.~~

[*S. obtusata* Fernald] June-July
BKB.

Var. *brachypoda*
nw to Ungavay Bay 57° 40' +

Nf., Que. (Gaspé Penin.
58° N) - w. to
James Bay - n. to
s. tip of Alta - Alaska

Send insect insects to S. F. Cooper

12. *Salix pyrifolia* Anderson. Balsam Willow

Shrub to 5 m. high, occasionally tree-like; twigs (young) yellowish to (older) ~~reddish~~ red and shining, glabrous; buds red, 2-3 mm. long; stipules ovate, 1-2 mm. long; or mostly wanting; leaves reddish while unfolding, ovate to broadly lanceolate or lanceolate-oblong (var. lanceolata Bebb) 4-10 or 13 cm. long, 2-4 or rarely 5 cm. wide, broadly rounded to cordate at base, acute to abruptly acuminate at apex, glandular crenate-serrate or -serrulate, glabrous, deep green above, glaucous and finely reticulate beneath, with balsamic fragrance; petioles slender, 0.3-2 cm. long; aments coetaneous, lax, 3-5 or 7 cm. long, to 2 cm. wide in fruit, on bracted peduncles 2-3 mm. long (stam.) or leafy peduncles 1-3 cm. long (pist.); scales oblong, 2-2.5 mm. long, reddish-brown, white-villous, becoming glabrate outside; ~~anthers~~ stamens 2, filaments free, glabrous, anthers first reddish, then yellow; capsules lanceolate-rostrate, glabrous, 7-9 mm. long; pedicels slender, 2.5-3.5 mm. long, glabrous; styles 0.3-0.5 mm. long, divided, stigmas short, emarginate; gland ventral, 0.5 mm. long.

Moist to wet or swampy ground. N.B. N.S. & n. N.B. w. to n. Minn. & s. Alta., n. to Lab. (54° N.), Que. (Clearwater R., 56° 30' N.), n. Alta. & ne. B.C. late May-Aug.

The form with lanceolate-oblong leaves has been segregated as var. lanceolata Bebb.

and Yukon Terr. at Pink Rapids at 64° N.

[*S. balsamifera*, Gray]

12. *Salix pyrifolia* Andersson. Balsam Willow

Shrub to 5 m. high, occasionally tree-like; twigs (young) yellowish to (older) red and shining, blabrous; buds red, 2-8 mm. long; stipules mostly wanting or ovate, 1-2 mm. long; petioles slender, 0.8-2 cm. long; leaves reddish while unfolding, ovate to broadly lanceolate or lanceolate-oblong (var. lanceolata Bebb), 4-10 or 13 cm. long, 2-4 or rarely 5 cm. wide, acute to abruptly acuminate at apex, broadly rounded to cordate at base, glandular crenate-serrate or -serrulate, blabrous, deep green above, glaucous and finely reticulate beneath, with balsamic fragrance; aments coetaneous, 3-5 or 7 cm. long, to 2 cm. wide and lax in fruit, on bracted peduncles 2-8 mm. long (stam.) or leafy peduncles 1-3 cm. long (pist.); scales oblong, 2-2.5 mm. long, reddish-brown, white-villous, becoming glabrate outside; stamens 2, filaments free, glabrous, anthers first reddish, then yellow; capsules lanceolate-rostrate, glabrous, 7-9 mm. long; pedicels slender, 2.5-3.5 mm. long, glabrous; styles 0.3-0.5 mm. long, fivided, stigmas short, emarginate; gland ventral, 0.5 mm. long.

Moist to wet or swampy ground. N. S., N. B., & n. N.E. w. to n. Minn. & s. Alta., n. to Lab. (54°N.), Que. (Clearwater R., 56°30' N.), n. Alta. & ne. B.C. & Yukon Terr. at Rink Rapids at 64°N.), Late May-Aug.

The form with lanceolate-oblong leaves has been segregated as var. lanceolata Bebb.

(*S. balsamifera*, Gray)

13. *S. glaucophylloides* Fernald.

Spreading to erect shrub or small tree to 5 m. high; branchlets stoutish, chestnut to dark brown, younger pubescent becoming glabrate, older glabrous; stipules ^{semicordate to} cordate to reniform (?), 3-10 mm. long, crenate-serrate; petioles stoutish, 5-12 mm. long, the large buds and petioles colored and clothed as the twigs; blades oblong or ^{broadly elliptical} broadly oblanceolate, ovate-oval, or obovate-oval. (lower sometimes obovate) lanceolate to ovate-lanceolate (?), or somewhat oblanceolate or obovate on fruiting twigs (?), acute or subacute at apex, rounded to cordate or sometimes narrowed at base, ^{on vig. shoots to 12 x 5-6 cm., petioles to 20 mm.} 4-9 or 12 cm. long, 1.5-4 or 6 cm. wide, plane, green, and somewhat shining above, glaucous and rather prominently veined beneath, margins ^{glab} crenate-serrate with gland-tipped teeth, somewhat pubescent while young, becoming glabrous with age.

Aments precocious to subcoetaneous, pedunculate, 2-4 or 5 cm. long, 1-1.5 cm. wide, peduncles 0.5-1.5 cm. long, white-hairy, bearing ~~2-4~~ small leaves, 2-4 scales brown or blackish, oblong-oblanceolate or obovate, 1.5-2 mm. long, white-pilose with long hairs; capsule conic-subulate, glabrous, rounded (not cordate) at base, (4-7 mm long, Fern), 7-10 mm. long (GRB, glaucophylla), pedicels (shorter than scales F) 2-4 mm. long (GRB, gl), styles slender, 1-1.5 mm. long; stigmas 0.5 mm. long, bifid; gland ventral, very short; stamens 2, filaments glabrous, (free ?).

Alluvial and sandy shores and limestone slopes, Mt. & N.B., w. to the Great Lakes and n. to James Bay (?) (*S. glaucophylla*, B. & B., Gray). May-June.

a. var. *albovestita* (Bell) Fern.

Seasonal shoots densely white-pilose, the 1-year and 2-year branchlets gray-pubescent to glabrate or glabrous; buds to 10 mm. long; stipules to 2 cm ^{to} ~~wide~~ long to 1 cm. wide, broadly reniform; petioles to 20 mm. long; leaves larger, 7-10 or 15 cm. long, 2-4 or ⁵⁻⁸ cm. wide, densely to thinly pubescent on both sides while young, the petioles and midribs remaining pubescent, especially above, reticulate with raised veins on both surfaces when mature; pistillate aments up to 8 cm. long and 2.4 cm. wide in fruit; capsules to 9 mm. long; pedicels to 2-3 mm. in fruit; styles 0.5-0.8 mm. long (GRB).

With the species, w. to Ohio. and

(*S. laurentiana* Fernald, in large part)

(There is no essential difference between *S. glaucophylloides* and *S. glaucophylla*)

rough draft for Vllus Fl. 6/47

~~12~~ 13. *Salix glaucophylloides* Fernald (*S. glaucophylla* Bebb).

Shrub to 5 m. high; branchlets yellowish to dark-brown, younger somewhat pubescent; stipules semicordate, 5-10 mm. long; petioles 5-12 mm. long; blades lanceolate, ovate-lanceolate, ovate-oval, or somewhat obovate-oval, acute to short-acuminate, rounded to cordate or sometimes narrowed at base, 4-9 or 12 cm. long, 1.5-4 or 6 cm. wide, glaucous beneath, glandular-crenate-serrate, sometimes sparsely pubescent while young; aments precocious-coetaneous, 2-5 ^{or 6} cm. long, on 2-4-leaved peduncles about 1 cm. long; scales brownish-black, oblanceolate-obovate, 1.5-2 mm. long, white-hairy; stamens 2, filaments glabrous; capsule subulate, 5-9 mm. long, glabrous, pedicel 1.5-3 mm. long; style 1-1.5 mm. long, stigmas 0.5 mm. long, bifid; gland very short;

Limestone slopes and sandy and alluvial shores, Nf. & N.B. w. to States around L.
(Ind., Ill., Wis.), glauc
Michigan, n. to James Bay (Que., Ont.) & Great Whale R., Que. (S. ~~macrophylla~~, B. & B.,
Gray). May-July.

a. Var. *albovestita* (Ball) Fern. Seasonal shoots densely white-pilose, the 1- and 2-year branchlets gray-pubescent to glabrate or glabrous; stipules subreniform, to 2 by 1 cm.; petioles to 2 cm.; leaves larger, 7-10 or 15 cm. long, 2-5 or 8 cm. wide, more or less densely pubescent while young, petioles and midribs remaining so; aments to 8 cm. long, ~~style 2-3 mm~~ but commoner eastward (S to Wayne Co., Ind. ~~St. Lawrence area, N. to Ohio~~). With the species ~~St. Lawrence area, N. to Ohio~~ Ind. (*S. laurentiana* Fernald, in large part, except type).

b. Var. *brevifolia* (Bebb) Low shrub to 2 m. high;
 / Blades mostly 2.5-5 cm. long, 0.5-2 cm wide,
 more coriaceous; dysauperate plants of sandy dunes and shores, ^{common in} Great Lakes area,
 rarer eastward.

var. *angustifolia* Bebb

not separable from species, being mostly young and undeveloped or summer shoots.

var. latifolia Bebb

Apparently based on vigorous shoots belonging to normal plants.

(13) *S. galucophylloides* varieties

ARB 6/26/57

var. *albovestita* (Ball) fern. See species sheet

var. *angustifolia* (Bebb) Doubtfully recognizable from available material, as the mature foliage specimens mostly represent seasonal shoots rather than the earlier fruiting shoot and the spring shoots from them.

blades 5 x 1, 7-9 x 1.5-2.5, and 12 x 2.5 cm.

var. *brevifolia* Bebb represents the depauperate plants of sand dunes and sandy shores, where sterile soil, reflected heat, and perhaps wind decrease vigor and speed of growth, and increase thickness of leaves. Blades mostly 2.5-5 cm. long by 0.5-1.5 or 2 cm. wide.

Look up any combinations made by Fernald.

Digitized by Hunt Institute for Botanical Documentation

rough draft for Ilhwa H.

20 rough draft 11/1/24
14. *Salix cordata* Michx. (not Muhl.)

Heart-Leafed Willow.

Shrub 2-3 m. high, all vegetative parts more or less hairy; branchlets stoutish, the seasonal and buds densely gray-tomentose, older ^{less so} glabrate; stipules cordate-ovate or subreniform, 6-15 mm. long, dentate; petioles stout, 4-8 mm. long, somewhat clasping; blades ovate-lanceolate to broadly ovate, abruptly acuminate, rounded or cordate at base 4-6 or 8 cm. by 1.5-3 or 4 cm., green on both sides, paler and strongly nerved beneath, ^{stout} more or less lanate, glandular-dentate-serrate, often with spinulose teeth (extremely variable); Aments coetaneous, 3-8 (or 10?) cm. long, on 3-5-leaved peduncles 1-2.5 cm. long; stamens 2, filaments glabrous; scales oblong-oblancoelate, brown, densely long-villous; capsule lanceolate, glabrous, 5-8 mm. long; pedicels glabrous, 0.5-1 mm. long; styles 0.7-1.5 mm. long; stigmas 0.3-0.6 mm. long, entire or somewhat bifid; gland short.

Alluvial and sandy lake and river shores, ^{Nf., Gaspé Penin., Que., & n. N.S. to} ~~Great Lakes and St. Lawrence Valley~~ Great Lakes, n. to James Bay (Que., Ont.) & sw. Hudson Bay, Ont. (56° N., 88° W.).
(*S. adenophylla*, B. & B. *S. syrticola*, Gray).

a. var. *abreata* Fernald. Twigs, petioles, and leaves (except midrib) glabrate to glabrous. Nf. Gaspé Penin., Que., to N.S., N.B., & n. N.S., rarer northward.

14. *S. cordata* Michaux

(not Michx.)

Heart-leaved W. (20)
all veg. parts m/f. Heavy

Shrub, often straggling, 2-3 or 4 m. high; branchlets stoutish, the seasonal

and the bud scales densely gray-tomentose, the older increasingly glabrate; stipules

6-15 mm. long, large, foliaceous, semi-cordate to cordate-ovate, glandular-dentate, more or less

tomentose; petioles stout, somewhat clasping, 4-8 mm. long, tomentose to glabrate;

blades ovate-lanceolate to broadly ovate, acute or abruptly acuminate, broadly rounded

or cordate at base, 4-6 or 8 cm. long, 1.5-3 or 4 cm. wide, lanate with long silky hairs

on both sides, becoming less so beneath, deep green above, slightly paler ~~below~~ and

prominently nerved beneath, the margins ^{side} dentate-serrate with often spinulose gland-

tipped teeth, ^{teeth} very variable in shape & size on same pet

aments coetaneous, 2-4 cm. long in flower, 6-8 (10 Fern) cm. long in fruit, on

3-5-leafed peduncles 1-2.5 cm. long; stamens 2, filaments glabrous, free?; scales

oblong, acute?, pale brown, densely villous with long hairs; capsule conic-rostrate,

glabrous, 5-8 mm. long; pedicels glabrous, 0.5-1 mm. long; styles 0.7-1.5 mm. long,

stigmas 0.3-0.5 mm. long, entire or ^{somewhat} slightly bifid; gland very short.

Digitized by Hunt Institute for Botanical Documentation

Alluvial and sandy shores of lakes and rivers, Que. & Ont. w around the Great

Lakes Ind. Ill. West Mich

to James Bay

(*S. adenophylla*, B. & B., ~~heavy~~;

S. syrticola ~~Gray~~, Gray

The Ind spec of Umbellat has long closely
set fine teeth

rough draft for Illus Fl. June, '947

21
15. *SALIX CALCICOLA* Fern. & Wiegand.

(Illus. Fl.)

all vegetative part hirsute; ~~leaves~~ ^{stems} ~~are~~ ^{are} glabrate
spreading shrub 0.5-2 m. high; branchlets short, stout, full of bud-scars, tomentose to villous, the 2-year becoming glabrate; buds stout, ovate, 5-10 mm. long, yellow, hairy; stipules semicordate, subovate or suborbicular, or broadly reniform, somewhat persistent to 2nd. year; and swt. marcescent; finely glandular-denticulate, hairy; leaves ovate, ovate-oval, or orbicular, (the ~~as~~ earlier obovate), acute or abruptly short-acuminate and occasionally plicate at apex, rounded to cordate at base, ^{1.5-4 cm. wide, 2-4.5 cm. long,} 3 by 4.5 to 4 by 4.5 cm., ^{entire} to sparingly glandular-serrulate-denticulate (closely and minutely so while young), dark green and somewhat shining above, glaucous and strongly reticulate with stout veins and midrib beneath, more or less pilose on both surfaces, especially ^{above and} on petioles and midrib, petioles short, stout, 2-4 mm. long, hairy;

aments stout, precocious or coetaneous, sessile on old wood, 3-6 or 8 cm. long, 1.2-1.8 cm. wide, naked or occasionally bracted at base;
scales broadly oval or obovate, blackish, rounded at apex, long-villous, mm. long
stamens 2, filaments long, glabrous, free; capsules lanceolate, subsessile, 7-8 or 9 mm. long, glabrous; pedicels short, 0.2-0.4 mm. long, glabrous; style 2-3 mm. long, entire; stigmas mostly 0.5 or to 1 mm. long, entire; gland 1 mm. long.

Limestone situations and peaty NW. Mt. and Table-top Mtn., 800-1125 m. elev., Gaspé Pénin., Que., n. on both side of James and Hudson Bay to Hudson Strait, n. Labrador, and s. Baffin Id., and to Man. and Keewatin (Chesterfield and Baker Lake).

2 { ^{from} *Salix* specimens from Gaspé Pénin (Table-top Mtn. elev. 900-1125 M. (Fern. & Collins 211, 1906; also James Bay and Ft. Churchill, Man. (U.S.N. H.)

1 { could not be Zebb in 1889, where ever only type (Maccom from So Twin Id. Jas Bay).

Limestone barrens and cliffs: NW. Mtd. and Gaspé Co. (Table-top Mtn.) Que., n. and NW. to both sides of James and Hudson Bays, incl. Man. (Churchill), Keewatin (Chesterfield and Baker Lake, Franklin (South Bay in s. Southampton Id., Hudson Strait and so. & c. Baffin Id. and.

man not in Hudson

16. *Salix pedicellaris* Pursh. Bog Willow

Slender bog shrub 0.4-1 or rarely 1.5 m. high, glabrous throughout; branchlets olive-green to dark brown; buds small; stipules nine; petioles slender, 5-8 mm. long; blades oblanceolate or narrowly obovate-oval, 2-4 or 6 cm. long, 1-2 cm. wide, acute to obtuse at apex, narrowed to rounded at base, entire, often delicately revolute, green and finely raised-reticulate on both sides, with parallel laterals; anthers coarsely, 1-2.5 or 5 cm. long, to 2 cm. wide in fruit, on leafy peduncles 2-4 or 5 cm. long; ~~flowers~~ scales oblong, 1 mm. long, yellowish-brown, occasionally with a few hairs at apex; stamens 2, filaments glabrous, free; capsules large-silulate, 6-7 or 8 mm. long; pedicels slender, 2-3.5 or 4 mm. long; style 0.1-0.2 mm. long; stigmas 0.2 mm. long, mostly divided; gland very short.

Sphagnum, bogs and swamps:

Mo. to c. N.Y. and Adj. Can., relatively rare compared with var. hypoglauca.

(Reported western occurrence apparently based on misidentification, or rapid drying which destroys glaucous color).

a. var. hypoglauca Fernald. Leaves distinctly glaucous beneath (when properly

dried), ~~sometimes~~ averaging a little larger and sometimes subobovate (*S. hebecarpa* Fernald, and widely distributed in part) throughout its range. Same habitats but much more abundant than the species;

Wf., N.B., N.R., N.Y., Gt. Lakes States, & n. Br., also Ore. & Wash., n.-w. to s.

Hudson R. (Que.), Mackenzie R., and c. B.C. (*S. pedicellaris*, B. & R., Gray, Rydb.).

S. simulans Fernald is a hybrid form

S. hebecarpa Fern. and *S. simulans* are hybrids, the former listed as *S. fuscescens* as B. & R.

16

(16) *S. pedicellaris* Pursh

Bog Willow

Glossy T. Fl.

(22)

Bog shrub, 0.5-2 m. high, glabrous throughout; branchlets olive green to dark brown; ^{slender} 6 or 8 ^{narrowly} stipules none; buds small; petioles 0-8 mm. long; blades oblanceolate, obovate-oval, 2.5 or obovate, 2-4 or 6 cm. long, 1-2 or 3 cm. wide, narrowed to rounded at base; acute to obtuse at apex, entire, often revolute finely, green on both sides or paler beneath, ^{raised} finely reticulate with parallel laterals ~~anastomosing~~ but prominently raised ^{leafy} aments coetaneous, 1-3.5 cm. long, lax, on large-leaved pedicels 2-4 or 5 cm. long, the pistillate to 2 cm. wide in fruit; stamens 2, filaments glabrous, free; scales yellowish-brown, oblong, 1 mm. long, obtuse, occasionally with a few hairs at apex; capsules lanceolate, 5-7 mm. long; pedicels slender, 2-3 or 3.5 mm. long; styles 0.1-0.2 mm. long, stigmas 0.2 mm. long, mostly divided. gland very short. ^{relatively uncommon,}

Sphagnum bogs and swamps, Que. to N.J., w. to n. Ia. & Wash., B.C. & n. Alta.

May-july.

var. *hypoglauca* Fernald. Leaves distinctly glaucous beneath. Same ~~size~~ habit-
as but much more abundant. Que. to N.J., w. to n. Ia. & Wash., n. to ~~Wash.~~ ^{Wash. D.C.}

(Too rapid drying or too much heat destroys the glaucous bloom; some specimens of the
species show faint glaucescence on apical leaves). (*S. pedicellaris*, B. & B. Gray)

var. *temescens* Fernald. Leaves narrower, oblanceolate, acute at both ends;
capsule to 10 mm. long. (Type from Mass.; occasionally in e. half of specific range
but long capsules not observed elsewhere than type.)

doubtful

(17) *Salix chlorolepis* Fernald (rewritten description by CRB)

ascending shrub 0.3-1 m. high; glabrous throughout;
 branchlets short, reddish brown to dark brown, subshining, often full of bud-scars;
 buds ~~short~~ stout, 1-2 mm. long, blunt; petioles stoutish, 1-3 mm. long;
 stipules none or rarely linear, 1-3 mm. long; ~~5-8 or rarely 12 mm. long~~
 leaves crowded, ^{broadly} narrowly elliptical or elliptic-oblancoate to elliptical or nar-
 rowly obovate, 1-2.5 or rarely 3 cm. long,
 mostly acutish at both ends or broadening until obtuse;
 entire or rarely sparsely micro-serrulate;
 bright green, plane, and subshining above,
 glaucous, ~~subreticulate~~, and glabrous, or the youngest sparsely short-sericeous,
 beneath; with raised primaries or subreticulate;
 few,
 aments coetaneous, 5-13 mm. long, on leafy peduncles 5-10 or 12 mm. long;
 scales narrowly obovate to oblong, 1.5-2.5 mm. long, obtuse to truncate, or acutish,
 green, glabrous, thin, some longitudinally veined;
 stamens 2, filaments free (1), glabrous;
 capsules narrowly lanceolate, subsessile, 3.5-5 mm. long, glabrous, apparently
 all infertile (1) (sheets);
 styles 0.7-1 or rarely 1.2 mm. long; entire;
 stigmas 0.4-0.6 or rarely 0.7 mm. long, more or less divided and divergent;
 gland not seen.

Known only from elevations of 800-1060 m. or higher, Coulee (Ruisseau) de Diable
 and summit of Mt. Albert, Gaspé Penin. Que. (6 collections; all apparently infertile)
 July-August. A peculiar plant, suggesting hybrid of *S. phylicifolia* and *S. ped-*
icellaris var. *hypoglauca*. *W. - West*

(18)

rough dft Slns H. (24)

18 S. herbacea L.

Creeping, semisubterranean, slender or somewhat stoutish, subherbaceous shrub in moss and humus, the slender chestnut branchlets ascending slightly; glabrous throughout (except scales); buds ovate 2-2.5 mm. long, chestnut; stipules none?; blades (3-5-or 7 per branchlet), oval to suborbicular or oblate-oval, mostly cordate at base, rounded to retuse at apex, 1-2.5 or 3 cm. long, 1-2 or 2.5 cm. wide, or to 2.5 cm. wide long, or sometimes wider than long (oblate-oval), green, somewhat shining, on both sides, distinctly reticulate beneath, crenate- or crenulate-dentate, the teeth ^{sometimes} often elongated and inflexed, often persisting to the second year, petioles slender to stoutish, 1-1.5 or 1.7 cm. long; aments serotinous, 8-12- or rarely 16-flowered, terminating short, 2-3- or rarely 4-leaved peduncles branchlets; scales obovate, yellowish-brown or darker (violet, Schn.), glabrous or sometimes sparsely pubescent; stamens 2, filaments glabrous, free; capsules (and ovaries) glabrous, subsessile, ³⁻⁴ -3 mm. long, ovoid-~~obovate~~ ^{brown}

styles 05 Enslate

stigmas 02-04 dlv

glands 2 (Schn)

~~obovate~~ brown

Old World; Greenland, ~~and~~ arctic islands, and Hudson Bay, so. to alpine areas of Gaspé Penin., Que.,
Me. & N.H. June-August.

S. Peasei Fernald, from Mt. Washington, N.H., is a hybrid of S. herbacea and S. ura-ursi.

PA Hammon Hb 5824 (18 2/24) 2 x 4/24

19

S. uva-ursi Pursh

Bear-berry Willow, Outler Willow

leafy glabrous

Prostrate, matted alpine shrub with stout or stoutish/branchlets ;

buds ^{1/2}

stipules (often distinct, Schn)

blades elliptical and acute ^{or} obovate and acutish to obtuse, base always acute,
 0.5-2 or 2.5 cm. long, 2-7 or 10 mm. wide (1 1/2 in by 1/2 in. Outler), (rarely 2.5 cm. long)
 green, shining, and more or less reticulate above, glaucescent to glaucous an pyromia-
 ently reticulate beneath; glabrous on both sides or the younger sometimes silky-villous,
 more or less glandular-crenate-denticulate, especially on apical half, persistent and
 somewhat marcescent; petioles stoutish, 2-4 ? mm. long;

aments coetaneous or serotinous 2, 1-2 or 3 cm. long

—wide, on lateral

leafy peduncles 0.5-2 cm. long; scales brownish or purplish with reddish or blackish
 tip, silvery-long-villous; stam 1 (by adhesion), rarely 2, filament glabrous, free ?;

capsule ovoid-colic, brownish, glabrous, 3-4 mm. long; ^{pers or subpers}

pedicel short

(scarcely exceeding gland Fern) glabrous

style mediocre (C), distinct (F), cleft at apex (S, key)

stigmas very short, bifid (S), cleft

gland l.

Greenland ? Labrador, Ungava Baffin Land s. to alpine summits of Gaspe Penin, Que

N.E. and N.Y. June to Aug. (F says "to Alaska" in Gray)

(20)

23

(26)

17 *Salix vestita* Pursh

Newell, Ill. F.

Low shrub, 0.2-0.6 or rarely 1 m. high; branches stout, depressed to ascending, rough with bud scars; branchlets stoutish, light- to dark-brown, pubescent to glabrous; buds stout, 5-10 mm. long, mostly hairy; stipules none; petioles stout, 2-10 mm. long, pubescent; blades thick, broadly oblong, oval, oval-obovate, or suborbicular, rounded to retuse at apex, obtuse to cordate at base, 2-6 or 8 cm. long, 1.5-4.5 or 5.5 cm. wide, closely crenate and somewhat revolute, deep green, glabrate, and depressed-rugose above, glaucous, subrugose, and long-villous beneath, especially on midribs and veins; aments serotinous, 2-4 cm. long, to 1 cm. wide (fruit), on mostly naked peduncles 0.5-1.5 or 2 cm. long; scales obovate, obtuse, 1 mm. long, tomentose; stamens 2, filaments glabrous, free; capsules ovoid-cone, 4-5 mm. long, subsessile, tomentose; style mostly obsolete, stigmas 0.2-0.3 mm. long, the apex cleft.

Rocky habitats; to 7000 ft. elev. N. Y. & Caspe Penin., Que., n. to Hudson Str., Que., and Chesterfield Inlet, Keewatin. Nw. Mont. & ne. Ore. n. to Jasper Park, Alta. The common form of the eastern area, rare in western

a. var. *erecta* Andersson. More erect; leaves narrower, oblong to oblong-oval, the apical broader. Rare eastward, the commoner form in western mountains. (H. ~~var. erecta~~)

~~Sp. 17.~~

did I see + St John
have an eastern glabrate var?
yes. var. *psocophylla*

Low shrub, 0.2-0.6 or rarely 1 m. high; branches stout, depressed to ascending, rough with bud scars; branchlets stoutish, light- to dark-brown, pubescent to glabrous; buds stout, 5-10 mm. long, mostly hairy; stipules none; petioles stout, 2-10 mm. long, pubescent; blades thick, broadly oblong, oval, oval-obovate, or suborbicular, rounded to retuse at apex, obtuse to cordate at base, 2-6 or 8 cm. long, 1.5-4.5 or 5.5 cm. wide,, closely crenate and somewhat revolute, deep green, glabrate, and depressed-rugose above, glaucous, subrugose, and long-villous beneath, especially on midribs and veins; aments serotinous, 2-4 cm. long, to 1 cm. wide (fruit), on mostly naked peduncles 0.5-1.5 or 2 cm. long; scales obovate, obtuse, 1 mm. long, tomentose; stamens 2, filaments glabrous, free; capsules ovoid-conoc, 4-5 mm. long, subsessile, tomentose; style mostly obsolete, stigmas 0.2-0.3 mm. long, the apex cleft.

Rocky habitats; to 7000 ft. elev.: W. Mf. & Gaspé Penin., Que., n. to Hudson Str., Que., and Chesterfield Inlet, Keewatin. Nw. Mont. & ne. Ore. n. to Jasper Park, Alta. The common form of the eastern area, rare in western.

a. var. *erecta* Andersson. More erect; leaves narrower, oblong to oblong-oval, the apical broader. Rare eastward, the commoner form in western mountains. (S. Fernaldii, Rydb.).

rewritten but no added data

20 ~~3~~. *Salix vestita* Pursh.

Depressed to ascending shrub, 0.2-0.6 or rarely 1 m. high; branches stout, rough with bud-scars; branchlets stoutish, divaricate, light- to dark-brown, pubescent to glabrous; buds stout, 5-10 mm. long, mostly hairy; stipules none; petioles stout, sulcate above, 2-10 mm. long, pubescent; leaves broadly oblong, oval, oval-obovate, or suborbicular, obtuse to retuse at both ends, 2-6 or 8 cm. long, 1.5-4.5 or 5.5 cm. wide, thick, closely crenate and somewhat revolute, deep green, glabrate, and depressed-rugose above, glaucous, subrugose, and ~~permanently~~ long-villous beneath, especially but often becoming glabrate; on veins; aments serotinous, 2-4 cm. long, to 1 cm. wide (fruit), on mostly naked peduncles 0.5-2 cm. long; scales narrowly to broadly obovate, 1 mm. long, obtuse, tomentose; stamens 2, filaments free, glabrous; capsules ovoid-conic, 4-5 mm. long, sessile or subsessile, tomentose; styles mostly obsolete, or very short; stigmas 0.2-0.3 mm. long, apex cleft.

Rocky habitats to 7000 ft. elev. Nf. and Que. (Gaspé Penin.), n. throughout Lab. and Que., w. to Keewatin (Chesterfield Inlet), cent. Alta., nw. Mont. and ne. Ore. The common form of eastern areas, rare in western. June-August. A form with the young

a. var. *erecta* Andersson. More erect; leaves narrower, ~~longer~~, oblong to oblong-oval, the apical broader. Rare eastward, the commoner form in western mountains.

~~Young leaves of this form are often very hairy, especially beneath, and the veins are often very prominent. The fruit is often very large and persistent.~~

young leaves only thinly villous and older glabrous except for a few hairs on veins beneath, is var. psilophylla Fern. and St. John, from n. shore of St. Lawrence R. but not yet reported from our area.

(var. psilophylla was described from a single collection from Mingan Ids., n. shore of St. L. River at 64° W. Long., which is just NE. of the ne. corner of New Brunswick (Wash.) No specimens with glabrous leaves in herb. CRB., except one with very small leaves from

(21)

26

20 Salix arctophila Cockl.

(S. arctica Liebmann, Fl. Danica 14, fasc. 42:7, pl. 2488, 1849.)

Prostrate with more or less subterranean stems;
 yellowish to red-brown or dark glabrous, "extremely brittle", Polunin.
 branchlets stoutish, 0.5-3 dm. long, trailing or rooting, glabrous, st. pruinose;
 buds ovate-lanceolate, 3-7 or 8 cm. long, yellowish to older brown, glabrous
 stipules linear to oblanceolate, 2-6 mm. long, acute, entire
 blades oblanceolate, elliptical, elliptical-obovate or obovate and acute or ~~min~~
 oval-ovate (and subcordate at base), 2.5-4 or 5 cm. long, 1.5-3.5 or 3.2 mm. wide,
 acute to rounded at base, short-acuminate to rounded-~~apiculate~~ at apex,
 dark green and shining above, glaucous~~escent~~ to glaucous beneath, raised reticulate
 with slender veins
 /on both surfaces, subentire to shallowly glandular-cremulate-denticulate, espec-
 ially on the distal portion, glabrous throughout; not persistent;
 petioles 5-18 or 24 mm. long, glabrous
 2-4-leafed
 aments coetaneous, erect on ascending leafy/peduncles 1-3 or 4 cm. long
 staminate slender, 3-5 cm. long, pistillate large, (3)-5-8 or 10 cm. long, 1-1.6 cm.
 wide, laxish, sometimes persistent
 mostly
 scales narrowly to/broadly obovate, obtuse, 1.5-2 mm. long, light-brown to blackish,
 especially at tip, long-villous, especially within
 stamens 2, filaments glabrous, free
 capsules lanceolate-subulate, 6.5-8 mm. long, thinly silvery short-pubescent
 pedicels 0.5-0.7 or 1 mm. long, pubescent
 styles 1-1.5 mm. long, occasionally cleft at apex
 stigmas shorter, 0.5-0.7 mm. long, usually divided
 gland 1, short, broad, 0.3-0.6 mm. long, truncate
 (oblong or ovate-conical, longer than the pedicel, in other spp. of Ovalif.)

Nfld. to Greenland, west to Anticosti Id., Caspe Peninsula, Mt. Katahdin, Me., west
 side of Hudson Bay, Great Bear Lake, Mack., and Bathurst Inlet; rare n. of Arctic

✓ *St. Sharn* *to 1*

(23) *Salix brachycarpa* Nuttall.

See J. Kengh⁷ dft.
mss (30)

Ascending to erect diffuse shrub 0.3-1.5 m. high; branchlets leafy, yellowish-brown, tomentose-glabrate; stipules none, or minute; petioles 3-5 mm. long, pubescent; leaves elliptic-oblong or somewhat oval, obtusish or abruptly acute at apex rounded to rarely subcordate at base; 2-4.5 cm. long, 6-15 mm. wide, entire, gray-pubescent to glabrate above, glaucescent, gray-pubescent, and sub-reticulate beneath; aments costaneous, numerous, 0.7-2 cm. long, subsessile or on leafy peduncles 5-12 mm. long; scales elliptical-oblongate or narrowly oval, obtuse, about 1.5 mm. long, yellowish-brown, pubescent; stamens 2, filaments free (?), pubescent at base; capsules ovate-lanceolate, 5-7 mm. long, ^{sessile to} subsessile, white-tomentose; pedicels ^{1/2} 10-12 mm. long; styles 0.8-1.3 mm. long, entire; stigmas about 0.5 mm. long, entire to div.

glaucescent

Nf. to Que. (Gaspé Penin.), n. to s. Greenland, w. to B.C. and s., above 2000 m. elev., to NM N.M., Utah, and Oreg. June-July. (*S. stricta* (Anderss.) Rydberg).

22a. Var. *antimima* (Schneider) Raup. A glabrate variety; young branchlets and ^{thinly} leaves ^{more or less} short-pubescent, older leaves often sparsely pubescent beneath; scales thinly villous without; ovaries somewhat pubescent apically or throughout but capsules usually glabrate. (*S. chlorolepis* var. *antimima* Schn.). Que. (Gaspé Penin., to w. shore James Bay and Keewatin (w. shore Hudson Bay), w. to n. Alta.

22b. Var. *Sonsoni* Ball. Smaller than the species in all organs; ^{long} 1-7 dm. tall; buds and petioles 1-2 mm. long; leaves 1-2.5 cm. long; aments globose, about 1 cm. long, subsessile, bracted; capsules 4-6 mm. long; styles 0.7-1 mm. long. (*S. brachycarpa*, var. *psammophila* Raup). Que. (Gaspé Penin.) to Hudson Bay area, sw. Greenland (and ^{Ice} land), w. in n. part of species range, to B.C. and s. Mont., Ida., and Oreg.

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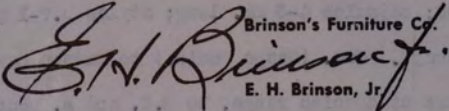
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(24) *Salix cordifolia* Pursh

rough draft, Ill. Fl. (31)

Depressed to ascending shrub, 0.5-1 or 2 m. high; branchlets stoutish, mostly short, the younger light brown, more or less densely villous, the older dark brown, somewhat shining, glabrous; bud scales stoutish, broadly lanceolate to ovate, 3-5 or 6 mm. long; pubescent to glabrous; stipules none, or lanceolate to semi-ovate, 2-5 mm. long, acute, serrulate; petioles stoutish to slender, mostly 5-10 mm., rarely 15 mm. long, densely to thinly pubescent to glabrous; leaves broadly oval to ovate or somewhat obovate, 2-5.5 or 7 cm. long, 1.5-3.5 or 4.5 cm. wide, obtuse to short-acute at apex, rounded, subcordate, or cordate at base, ~~entire~~, dark green, glaucescent to glaucous beneath, more or less silky-villous on both sides, often becoming glabrate and sometimes glabrous, entire or the larger somewhat crenulate; ("leaves of sprouts larger, thinner, and often more strongly cordate". Fernald).

aments ochraceous, 2-5 or 6 cm. long, 1.5-1.8 cm. wide in fruit, 1-2.5 or 3 cm. long; scales obovate to oblanceolate, 1.5-2⁵ or mm. long, yellowish-brown to light-brown, subretuse to rounded to acutish, villous; stamens 2, filaments free, capsules ovoid-conic, 6-7 or 8 mm. long, subsessile, densely gray-villous; pedicels stoutish, 0.3-0.7 or 1.2 mm. long, pubescent; styles 0.5-0.8 or 1 mm. long, entire or sometimes divided at apex; sometimes puberulent, especially at base; stigmas 0.5-0.7 mm. long, more or less divided; gland

Rocky slopes and shores and also in swampy ground. The typical form (var. typica Fernald; *S. labradorica* Rydberg) not in Ill. Flora range; Nf. and se. Que., n. to Greenland and e. shore of James and Hudson Bays. ^uJuly-August. (*S. Waghornii* (in part), B. and H.)

a. var. *callicarpaea* (Trautvetter) Fernald. Depressed, erect or ascending shrub, to 2 m. high; branchlets silky-villous to glabrate; stipules more frequent than in species; leave narrowly to broadly elliptical or oblong, or oblanceolate to narrowly obovate, 2.5-6 cm. long, 1-3.5 cm. wide, acute to obtuse at apex and base, silky-villous when young, becoming more or less glabrate in age.

Habitats of the species. Que. (Gaspé Penin.) to Nf., n. to Greenland and w. to Ont. and Keewatin (w. side Hudson Bay), ne. Mack., and Franklin Dist. to Victoria

14. July-Aug. *S. Waghornii* (Muhl.) B + B.

S. callicarpaea, B + B;

b. var. *intensa* Fernald. Depressed to erect, to 1.7 m. high; branchlets villous; leaves narrowly to broadly oval, or ovate or obovate, 2-4.5 cm. long, 1-2.5 cm. wide, acute to obtuse or apiculate at apex, acute to mostly rounded at base, densely gray-villous on both sides.

Mostly in rocky habitats. Nf. and Que. (Gaspé Penin., Table-top Mtn. to 1200 m. elev.), n. to Greenland and w. in Que. (Ungava) to Ont. (James Bay). July-August.

c. var. *Macounii* (Rydberg) Schneider. Diffuse depressed or trailing shrub; branchlets villous; leaves broadly elliptical or oblong or narrowly obovate, 1-2.5 or 3 cm. long, 0.5-1.5 cm. wide, acute or acutish at apex and base, or obtusish at apex, villous to glabrate, the smaller sometimes sparingly denticulate (var. *hypopriolata* Schneider); aments scarcely more than 3 cm. long.

Dry serpentine or limestone slopes and ridges and shores, and also in peaty or swampy thickets. Que. (Gaspé Penin.) to Nf., n. to Greenland, w. to Ont. (James and Hudson Bays), and n. Yukon. July-Aug. (*S. vacciniformis* Rydberg;)

S. Macounii, B + B.

pet shrub
aments to 4
pet to 3.5

expands. After the emergency oversupply is reduced, the industry should be guided toward a controlled expansion up to the limit of consumer purchasing power.

In addition to the use of funds for direct individual adjustments to secure the proper balance between supply and demand, we propose to inaugurate an intensive educational campaign among cooperating producers to assist them in determining and applying the most economical and effective methods of complying with the reduction specified in their contracts. The Bureau of Dairy Industry and the Agricultural Extension Service already have mapped out tentative plans to fit such a campaign.

The object in assistance of farmers in economical production and aid for them in selection of profitable and practical means of production adjustment. It is further proposed to allocate such sums as Congress may determine for two other purposes.

One of the plans is to engage in an intensive campaign to eradicate tuberculosis in dairy cattle. For a two-year campaign on a joint basis as at present, sharing costs between the States and Federal Government, the Federal share of the expense is estimated at about \$5,000,000. The various States requiring further eradication of tuberculosis in cattle would appropriate sums to assist in the work. It is estimated that there are about 5,000,000 head of dairy cattle yet to be tested for tuberculosis, with about 600,000 head as the number normally expected to be subject to removal.

Speeding up this campaign so as to complete the testing in one year would require about \$40,000,000 which would be expended mostly in four or five states. The tuberculin testing campaign is recognized primarily as a health and public welfare measure rather than a direct

(93 ^{Ill. Flora} *dupl*) (25) *Salix candida* Fluegge. Sage-leaved Willow. Hoary Willow.

Low shrub 2-10 dm. high; branches divaricate, full of bud-scars, brownish, glabrous; branchlets densely white-tomentose; stipules lanceolate, glandular; leaves linear-oblong, oblong, or narrowly to rarely broadly oblanceolate, 4-8 or 12 cm. long, 0.7-2 or 2.4 cm. wide, mostly acute at both ends, margins revolute, entire to glandular-crenulate, dull and thinly tomentose with sunken veins above, densely white tomentose and subrugose beneath; aments coetaneous, 1-5 cm. long, on leafy-bracted peduncles 0.5-2 cm. long; scales obovate or elliptical, 1.5-2 or 2.5 mm. long, acute, brown, thinly pubescent-tomentose; stamens 2, filaments free, capsules lanceolate, 6-8 mm. long, subsessile, white-tomentose; pedicels stoutish, 0.2-0.5 or rarely 0.7 mm. long, tomentose; styles 1.2-1.5 mm. long, reddish, entire to divided; stigmas 0.4-0.6 mm. long, entire to divided, divaricate, reddish.

Cold bogs in glaciated areas. Nf. to Hudson Bay and cent. B.C., sparingly in Mack., s. to n. parts of N.J., Pa., Ohio, Ind., Ill., and Ia., ne. S.D., and mts. of Colo. and S.D. to Ida. May-July.

a. Var *demidata* Andersson. Leaves narrower, glabrescent or glabrate on both sides, especially above, sometimes glaucescent beneath. Sparingly with the species.

(26) *Salix cryptodonta* Fernald

100.72

(34) msa rough draft.

Shrub 1-4 m. high; branchlets slender, ~~youngest~~ yellowish and densely white-tomentose, ^{growing to} older dark brown and becoming glabrate; stipules ^{mostly} semi-ovate to ~~obovate~~, 3-5 mm. long, acute; ~~stipules~~ ^{petioles} stoutish, 2-3 mm. long, tomentose; leaves elliptic-lanceolate or ~~oblong~~ oblanceolate to ~~broadly~~ broadly elliptic-ovate, 3-6 cm. long (type), 1.2-1.8 ² or 2.1 cm. wide, acute at apex, acute to rounded at base, dark-green somewhat tomentose with subimpressed veins above, gray-tomentose with raised or weakly rugose veins beneath, margins revolute, shallowly glandular-crenulate; aments ecetaneous, 2-4 cm. long, to 1.7 mm. wide, laxish, on leafy peduncles 0.5-1.5 cm. long; scales linear-oblong or linear-ob lanceolate, 1.5-2.5 or 3 mm. long, acute, reddish yellow, ^{villous} hairy at apex; stamens 2 ² capsules lanceolate, 5-7 mm. long, gray-tomentose; pedicels 1-2 ² or 2.5 mm. long, pubescent; styles 0.8-1 mm. long, entire; stigmas 0.3-0.5 mm. long, mostly divided; gland capitate, slender, about 0.5 mm. long.

Cool moist stream banks and glades. Nf. 25 and Que. (Gaspé Penin. and Mistissini).

April-May.

aments do not exceed 4 mm in CRB herb.

(26) *Salix cryptodonta* Fernald

Det. J.F.
(34) sample d.f.

Shrub 1-4 m. high

branchlets slender, the youngest yellowish and densely white-tomentose, the older dark-brown and becoming glabrate

budscales small, brown, tomentose;

stipules semi-ovate to lanceolate, 3-5 mm. long, acute, glandular-serrate, tomentose

petioles stoutish, 2-3 mm. long, tomentose;

leaves elliptic-lanceolate, ~~or~~ elliptic oblanceolate, or oblong-lanceolate, to broadly elliptical or elliptica-ovate, 3-5 or 6/cm. long, 1.2-1.8 or 2.1 cm. wide, acuminate to acute at apex, acute to rounded at base, margins revolute, shallowly/cremulate, upper surface dark green, more or less tomentose, veins plane to impressed, becoming

lower surface gray-tomentose, with raised primary veins or/weakly rugose; coetaneous,

aments/2-3.5 or 4 mm. long, 1.5-1.7 cm. wide, becoming lax, on leafy peduncles

0.5-1.5 cm. long,

scales linear-oblong, or linear-oblancheolate, 1.5-2.5 or 3 mm. long, acute, reddish

yellow, apically ^{villous} ~~glabrous~~ with hairs 1.5 mm. long;

stamens

capsules("conic-subulate"; as was said for *S. coactilis*)

5-7 mm. long (not "8-10" mm. unless pedicels and styles included)

gray tomentose;

pedicels 1-1.5 or 2.5 mm. ("barely shorter than scale"), pubescent;

styles 0.8-1 mm. long ("barely 1 mm. long"); entire;

stigmas 0.3-0.5 mm. long, mostly divided;

gland slender, about 0.5 mm. long, capitate.

Cool moist stream banks and glades, Mt. and Que. (Faspe Penin., Matapedia, and Mistissini. April-May.

11-12
11-12
11-12
11-12

0

11-12

11-12

NO. 11-12

Ill. Th. rough dft.

(35)

(27) *Salix argyrocarpa* Andersson

to often
 Bushy shrub, rarely 0.5 m. high, erect or depressed at apex
 branchlets short, leafy, reddish-brown, glabrous or ~~or~~ the youngest puberulent
 bud-scales ovate, short, 2-4 mm. long, reddish-brown, puberulent to glabrous
 stipules wanting, or minute, deciduous
 petioles short, stoutish, 2-5 or mm. long, puberulent to glabrous
 leaves small, narrowly elliptical to elliptical-oblongate, 2-4 or 5 cm. long,
 6-10 or mm. wide, acute at both ends or the lower broadly oblongate and
 obtuse at apex
 margins slightly revolute, subentire to closely crenulate
 veins numerous, wide-angled, closely parallel
 above
 upper surface dark green subshining, with impressed midrib and veins, beneath
 glaucescent and densely to thinly long-sericeous, with raised veins and midrib,

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aments coetaneous, 1-2.5 or cm. long, mm. wide, becoming lax?

on leafy peduncles 0.5-1 or cm. long,
 scales obovate to oblongate, 1-2 mm. long, rounded or obtuse at apex,

pale brownish blackish, thinly pilose,

stamens 2, filaments

capsules ovate-lanceolate, 2-4 or mm. long, acute?, densely short-sericeous

pedicels 1-2 or mm. long, sericeous

styles 0.5-0.6 mm. long, entire

stigmas 0.1-0.3 mm. long, entire to divided

gland (variously doubled in stem. Fern.)

Outlet 7423
Hatched - large
rhiz.
+ pellete

highest NH. and Am. (Espe. Fern.)
 Moist ravines and alpine slopes, mts. of N. Me. and Vt., N. to Lab. Coast (58° N.)

June-July

no synonyms

(27) *Salix argyrocarpa* Andersson

Miss. rough draft.

Bushy shrub to 0.5 m. high, often depressed at base; branchlets short, leafy, full of bud-scars, reddish-brown, puberulent (young) to glabrous; stipules none, or minute, deciduous; petioles stoutish, to 6 mm. long; leaves narrowly elliptical to elliptic-oblongate, 2-4 or 5 cm. long, to 1 cm. wide, acute at both ends or lower obtusish, dark-green and subshining with impressed veins above, glaucescent and densely to thinly long-sericeous to glabrate beneath, margins subrevolute and subentire to closely crenulate, primary veins numerous, wide-angled, closely parallel; aments coetaneous, 1-3 cm. long, on leafy peduncles 0.5-1 cm. long; scales mostly oblongate, 1-1.8 mm. long, obtuse-acutish, brownish-black, thinly villous; capsules ovate-lanceolate, 2-4 mm. long, densely short-sericeous; pedicels 1-2 mm. long, sericeous; styles about 0.5 mm. long, entire; stigmas 0.1-0.5 mm. long, entire to divided.

Moist ravines and alpine slopes. ~~Highest mts. of the~~ Mts. of n. parts of Vt., N.H., Me., and Que. (Gaspe. Penin.) ne. to N.Y. and N. in Lab. (58° N).

J^u ne-July.

max height to 1.7 m. on one specimen. CRD
max peduncle maximum 1.1 or 1.2 m CRD

no synonyms in Mans.

(28) *Salix pellita* Andersson

S. psila Sch. lvs glabrate to
glabrous. *Asprey* (36)

Large shrub or small tree, 3-5 m.

branchlets longish, mid-thick, the younger yellowish brown and puberulent, ~~older~~ ^{thinner} olive-brown, glabrous and often somewhat pruinose, dull

bud-scales lanceolate, 5-8 or 10 mm. long, tips often out-curved,

puberulent to becoming glabrous, sometimes pruinose

petioles slenderish, 4-8 or 10 mm. long, puberulent to glabrous

leaves linear-lanceolate or linear-oblongate, ^{to 10 mm} 4-10 or 13 cm. long,

8-15 or 22 mm. wide,

acuminate to acute at apex, acute or the broader obtuse to rounded at base,

margins somewhat revolute, entire to shallowly undulate-crenulate

or rarely crenate,

dark green and puberulent to glabrate above, with subimpressed veins, densely

glaucous and velvety or silky pubescent, sometimes becoming glabrate

veins numerous, wide-angled, and closely parallel, raised and somewhat reticulate beneath;

aments ^{sub} free to coad

2-5

1-1.5 mm

on leafy bracted peduncles

1-

stamens 2, filaments free, glabrous (Gray Man. "ey)

scales ^{obov} to oblong, ^{addition to acutish} 1-1.5 mm

slightly
long with

capsules

^{is} lance-
obovate

4-5 mm. long,

white tomentose

densely white "tomentose"

pedicels

very sh., pub

styles

0.8-1.2 entire

yellowish, turning brown

stigmas

0.4-0.5-0.6

entire

gland

nf. / N.S. n.

Alluvial or gravelly river banks, shores,

and swamps, Y. Me. and Vt., Que. n. to Lake St. John, w to Man. & Sask.

N. to Lab. Que (N. Ungava), James + S. Hudson Bay, N.W. Ark.

(29) *Salix viminalis* L. Osier

all. Fl. (37)
rough dg.

Introduced few-stemmed shrub or tree, up to 18 m. high; (many variable forms developed during centuries of cultivation) in Europe);
branchlets slender, sometimes slightly pendulous, yellowish to olive ^{brown} ~~green~~ or ~~sliv~~ reddish-brown, puberulent to glabrous;
budscales 3-7 or 9 mm. long, colored and clothed as branchlets;
petioles slender, 5-7 or 8 ¹² mm. long, puberulent to glabrous;
stipules mostly wanting, or linear or linear-lanceolate, 3-7 or 9 mm. long;
leaves linear-lanceolate, 5-10 or 13 ¹⁷ cm. long, 5-10 or 13 ¹⁷⁻²⁸ mm. wide,
long-acuminate at apex, acute at base, margins revolute, entire or shallowly undulate, primary veins numerous, wide-angled, parallel,
dark green, dull, and mostly puberulent with impressed midrib and subimpressed primaries above, glaucous ? and densely very short-sericeous beneath with glabrate-glabrous raised yellow midrib and raised primaries,
aments ^{subsessile} ~~coetaneous~~, sessile (or subsessile ^{Gray} ~~2~~), rarely bracted, 2-5 ⁶ cm. long, (5-7 cm. Gray), 0.8-^{1.5} mm. wide;
scales broadly oval to elliptical, 1.5-2 or 2.5 mm. long, obtusish to acute, black, ^{thin} thinly long-villous;
stamens 2, filaments glabrous, ^{free} (Gray)
capsules lanceolate, sessile or subsessile, 4-5 or ⁶ mm. long (2-2 mm. Gray)
densely short sericeous;
pedicels ^{slit at apex} ~~slit at apex~~ ^{to 0.5 mm}
styles 0.7-1.2 mm. long, subclavate, entire or partly divided at apex,
styles ^{may} 0.5-0.8 mm. long, entire, notched, or divided, reflexed.
gland
and ornament
Widely introduced for basketry in early days; occasionally escaped in e. U.S. and lower Canada. April-May.

no synonymo

(30) *Salix planifolia* Pursh.

(38)

(40m)

Erect shrub, 1-3 m. tall; branchlets stoutish, divaricate, younger chestnut to reddish, older red to brown, shining, glabrous, ^(older) or new growth sometimes puberulent; stipules none, or rare, small; ^{petioles 1-9 or 12 mm. long;} leaves rather crowded, narrowly to broadly elliptical, to elliptic-oblongate or narrowly obovate, 3-6 or 8 cm. long, 1-2.5 or 3.5 cm. wide ^{or longer obovate at base,} acute at both ends, subrevolute, entire to sparsely or rarely closely crenate-serrulate on the apical portion, or rarely throughout, light green and glabrous above, sparsely spaced, sericeous to glabrous beneath, primary veins numerous, slender, closely parallel, somewhat elevated beneath;

aments precocious, sessile, 2.5-5 or cm. long,

scales oval to obovate, ^{2-3 mm. long} acutish, black, long-villous;

stamens 2, filaments

capsules lanceolate, subsessile, 6-7 or mm. long, finely sericeous,

pedicels stoutish, 0.1-0.3 mm. long;

styles 1-1.3 or mm. long, entire

stigmas about 0.3-0.5 mm. long, entire

Wet meadows, lake and stream banks, and drier rocky areas, Lab. (58° N.) w. to s. Mack., cent. Alta and B.C., s. to Que. (Gaspé Penin.), n. N.E., n. Minn., and Rocky Mtn. States.

[*S. phyllifolia*, B+B, Gray]

✓ styles do not exceed 1.5 mm. or very rarely 1.7 mm.
✓ stigmas rarely partly divided (about 1/2)
✓ anthers are always precocious

(31) *Salix pedunculata* Fernald (from translation by CRB.) plus study

Erect shrub 0.5-1.5 m. high (based on type only.)

new branchlets "greyish-brown (fuscis)" yellowish-brown and sometime ~~thinly~~ sericeous, older reddish-brown to blackish, often shining, glabrous, and somewhat pruinose divaricate, "finally (deinde) chestnut, shining"

bud-scales ("well developed not seen") 3-5 or 7 mm. long, brown, puberulent to glabrous; stipules rarely present, or lanceolate, 2-3 mm. long, glandular-"dentate", deciduous; petioles "3-8 mm. long",

leaves elliptic-oblong or elliptic-oblancoelate or narrowly obovate, rarely obovate, 2-6 or 8 cm. long, 1-2.5 or 4 cm. wide, more or less acute or the ^{wider} ~~longer~~ broadly apiculate or rounded apiculate, narrowed at base, dark-green, plane, and glabrous, and somewhat shining above, glaucescent and the younger somewhat sericeous, the older somewhat reticulate, beneath, ^{sub}entire to shallowly and irregularly or sometimes closely crenulate-serrulate, primary veins numerous, slender, closely parallel;

aments coetaneous, staminate subsessile, pistillate 4-6 or 8 cm. long, mm 1.1-1.4 mm. wide, loduncles 0.5-2.5 cm. long with 2-3 small deciduous leaves;

scales narrowly obovate to oblong-oblancoelate, 2-3 or 4 mm. long, obtusish to acute, blackish, long-villous;

stamens 2, filaments

capsules ovoid-lanceolate, 5-6 or mm. long (6-8 mm. long, long-rostrate" (Fern.) short-sericeous;

pedicels 1-1.5 or 2 mm. long, puberulent; "twice as long as elongated gland" Fern.

styles 1.2-1.5 or 2 mm. long, "subclavate above"

stigma ^{notched} 0.3-0.5 or 0.7 mm. long, ~~notched~~ to divided, "half as long as style, base not distinct" Fern. (The subclavate styles and indistinct bases of stigmas are partly the effects of frost injury. CRB)

Differs from *S. planifolia* in longer aments, peduncles, longer capsules & pedicels and shorter capsule pubescent.

Moist shores, stream banks, and tundra, Hb., Lab. (to 58° N.), Que. (Gaspé to L. Mistissini. May-June

(32) *Salix petiolaris* J.E. Smith. Meadow Willow.

(40)
Illus. Flora, rough dra.
June, 1949

2-5 m. high

Many-stemmed shrub (southward) to few-stemmed tree (northward) 5-7 m. high;; branchlets slender, yellowish to dark brown, or reddish (in drier plains, glabrous or the young puberulent; bud scales small; stipules none; petioles slender, 5-10 or 20 mm. long; leaves narrowly lanceolate or narrowly oblanceolate, acute-acuminate at apex, acute at base, 5-8 or 10 cm. long, 3-12 or 15 mm. wide, sprout leaves 12-15.6 or sometimes subentire, glabrous, cm. long, 1.5-2.9 cm. wide, closely glandular-serrulate, dark green, and somewhat shining above, subglaucous to glaucous beneath, usually thinly sericeous beneath when young, becoming glabrous and finely reticulate in age;

aments (subprecocious?) to coetaneous, 1-3.5 cm. long, subsessile or on bracted peduncles 1-2 cm. long, becoming lax in fruit and to 2-2.5 cm. wide; scales narrowly to broadly oblanceolate to oblong-spatulate, slightly erose or truncate to acute, 1.5-2 mm. long, light to dark brown, thinly pilose, persistent; stamens 2, filaments slender, free, glabrous or finely pubescent at base; capsules lanceolate-conic, 6-8 mm. long, acute, thinly sericeous; pedicels 2.5-4 or 5 mm. long, puberulent; styles 0.1-0.4 mm. long, entire; stigmas 0.4-0.5 mm. long, entire & divided; gland

Moist alluvial meadows and stream and lake banks, N.B. to James Bay and cent. Alta., s. to N.J. and west to n. Nebr., Colo. (Long's Peak), and Mont; sporadic in Va. & Okla. April-May. The low clumpy southern shrub with subentire leaves only 3-6 cm. long and 4-10 mm. wide is sometimes referred to var. *angustifolia* Andersson, but the three characters, low height, small leaves, and subentire margin are not necessarily correlated.

S. gracilis, Rydb

mas. rough dfl.

(33) *Salix subsericea* (Andersson) Schneider. False Silky Willow.

Diffuse shrub, 1-2.5 m. high; branchlets slender, divaricate, orange to brown, puberulent to glabrous; stipules none, or rarely lanceolate, mm. long; petioles slender, to 10 mm. long, mostly glabrate; leaves linear-lanceolate to lanceolate or oblanceolate, 3-8 cm. long, 0.8-2 cm. wide, acute at both ends or rarely obtuse at base, subentire to serrulate, finely pubescent above, glaucous and densely sericeous to glabrate beneath; aments subprecocious to coetaneous, 1.5-3.5 cm. long, to 1.8 cm. wide, becoming lax, on leafy-bracted peduncles 0.5-1.5 cm. long; scales oblong-oblanceolate, 1-2 mm. long, obtuse to acute, blackish, villous; filaments green, glabrous; capsule narrowly-lanceolate, 5-8 mm. long, ^{finely} ~~sericeous~~ sericeous; pedicels slender, 1.5-3 mm. long, puberulent; styles 0.0-0.2 mm. long, entire; stigmas 0.2-0.4 mm. long, entire to divided; gland minute.

Meadows and moist places, mostly near streams. Mass. n. to Que. (49° N.), w. to s. Sask. and Alta, and n. parts of Ind. Ill., Ia., and Nebr. April-May.

(*S. petiolaris* & *S. sericea*, Rydb.)

Digitized by Hunt Institute for Botanical Documentation

7/33 No stipules seen in rapid survey of large number of leafy shoots in herb CRB

(33) *Salix subsericea* (Andersson) Schneider False Silky Willow

Much branched shrub 1-2.5 or m. high; branchlets slender, divaricate, reddish-yellow to brown, younger puberulent to glabrate; bud scales small, 3-5 or 7 mm. long, puberulent to glabrous, brown; stipules none, or rarely lanceolate, acute, mm. long, serrulate; petioles slender, 5-10 mm. long, puberulent to glabrate; leaves linear-lanceolate to lanceolate or oblanceolate, 3-6 or 8 (rarely 9) cm. long, 0.8-1.5 or 2 cm. wide, acuminate at apex, acuminate or acute to rarely obtuse at base, subentire to finely serrulate, dark green and usually finely pubescent to glabrate above, glaucous and densely sericeous to glabrate and finely reticulate in age beneath;

aments subprecoocious or mostly coetaneous, 1.5-3 or 3.5 cm. long, 1-1.5 or 1.8 cm. wide, staminate subsessile, bracted, pistillate ^{becoming lax,} on leafy-bracted peduncles (sometimes becoming naked), 0.7-1.22 or 1.5 cm. long,;

scales oblong or oblanceolate, 1-2 mm. long, obtuse to acute at apex, blackish, pilose; stamens 2, filaments free, glabrous (always?);

capsules narrowly lanceolate, 5-7 or 8 mm. long, obtusish, finely sericeous; pedicels slender, 1.5-2.5 or 3 mm. long, puberulent; styles 0-0.1 or 0.2 mm. long, stigmas 0.2-0.4 mm. long, entire to divided, erect or spreading; ~~gland minute, slender, about 0.3 mm. long.~~ gland minute, slender, about 0.3 mm. long.

Meadows and moist places, mostly near streams, Mass. n. to Que. (49° N.), and west to s. Sask. and Alta., and n. parts of Ind. Ill., Ia., and Nebr. April - May

Spetularis x *S. spica*, *Druck* *draft to office*

(34) *Salix sericea* Marshall. Silky Willow

J. E. F. Lora

(42)

Shrub or small tree, 1-6 or rarely 8 m. high; branchlets slender, light to mostly dark brown, puberulent to glabrous; stipules lanceolate to semi-ovate, 3-10 mm. long, mostly deciduous; petioles slender, 5-10 mm. long, puberulent leaves narrowly lanceolate to lanceolate, 4-10 or 14 cm. long, 1-2 or 3 cm. wide, acuminate at apex, acute to rounded at base, closely serrate, dark-green and puberulent to glabrous above, glaucous and densely to thinly sericeous beneath, drying darker, reticulate in age; aments precocious, 1-4 cm. long, 8-10 mm. wide, subsessile or on narrow-bracted peduncles to 10 mm. long; scales ovate-oval, 1-1.5 mm. long, obtuse, blackish, stamens 2, filaments free, glabrous; long-villous; capsules ovoid-oblong, blunt, 3-5 mm. long, short-sericeous; pedicels 1-1.5 or 2 mm. long, pubescent; styles 0.1-0.4 mm. long, entire or divided; stigmas very short, entire or notched.

Moist rocky ground, often in or near running water, N.S. and N.B. to Mich. and e. Ia., s. to Ga. and se. Mo. Feb.- May.

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msa

- ✓ pedicels 0.5-1 or rarely 1.5 mm., pubescent. ^{msa}
- ✓ scale length 0.7-1 mm.
- ✓ stigmas 0.2-0.3 mm.

no Man. synonyms

(35) *Salix coactilis* Fernald

Maine Willow

(43) *Salix* *R.*
rough dyl.

Large shrub 2-(5)? m. high; branchlets slender, subangular in drying, young yellowish and puberulent, older dark green to blackish, glabrous, subshining; buds to 5 mm., scale small; stipules narrowly to broadly semi-ovate, 5-10 or 13 mm. long, sharply acuminate, serrulate, sericeous beneath, persistent; often pedicellate; petioles slender, 7-15 or 20 mm. long, puberulent; leaves narrowly to broadly elliptic-lanceolate, or somewhat oblanceolate, or rarely ovate-lanceolate, 5-10 or 13 cm. long, 2-3.5 or 4 cm. wide, acuminate at apex, acute to rounded at base, serrulate to serrate-dentate, to coarsely dentate or sometimes spinulose dentate, dark ~~green~~ green and ~~glabrous~~ *below* glabrous (except puberulent midrib) above, glaucescent and densely sericeous *above*, becoming thinly so or glabrate in age;

aments subprecocious ~~to~~ coetaneous, slender, 2-5.5 cm. long, 7-8 mm. wide, on short leafy peduncles 0.5-1.5 cm. long; scales oblong or narrowly obovate, 1-1.3 mm. long, mostly obtuse, dark brown to blackish, densely long-hairy; stamens 2, filaments

capsules lanceolate, bluntish, about 5 mm. long, white-pubescent, becoming silvery-gray-pubescent; pedicels 1-1.5 mm. long, puberulent; styles 0.3-0.5 or 0.6 mm. long, entire; stigmas 0.1-0.2 mm. long, entire to divided; gland short. River-bank thickets, arbor-vitae swamps, and gravelly places, Maine (Aroostook and Penobscot Cos.) and N.B. Resembles *S. sericea* but nearly all organs larger.

May-June

no anthers on

(35) *Salix coactilis* Fernald

(43)
miss, rough draft

Shrub 2-5 m. high; branchlets slender, yellowish and puberulent (young) to blackish, subshining, and glabrous; stipules semi-ovate, 5-13 mm. long, acuminate; petioles slender, 7-20 mm. long, puberulent; leaves narrowly to broadly elliptic-lanceolate, rarely ovate-lanceolate or somewhat oblanceolate, 5-10 or 13 cm. long, 2-4 cm. wide, acuminate at apex, acute to rounded at base, dark-green and glabrous (except midrib) above, glaucescent and densely sericeous beneath, becoming glabrate in age, serrate to dentate; aments subprecocious to coetaneous, 2-5.5 cm. long, 7-8 mm. wide, on leafy peduncles 0.5-1.5 mm. long; scales narrowly obovate to oblong, 1-1.3 mm. long, obtusish, blackish, densely long-villous; stamens 2; capsules lanceolate, bluntish, about 5 mm. long, silky-pubescent; pedicels 1-1.5 mm. long, puberulent; styles 0.3-0.6 mm. long, entire; stigmas 0.1-0.2 mm. long, entire to divided; gland short. Resembles *S. sericea* but nearly all organs larger.

River-bank thickets, arbor-vitae swamps, and gravelly places. No. Mo. (Arcos-took and Penobscot Cos.) and N.B. May-June.

(44)
(36) included under *S. discolor*

Salix caprea L. Goat or Florists Willow. Introduced shrub or small tree; similar to *S. discolor*; leaves obovate, broadly oval, or suborbicular, 5-10 cm. long, 3-6 or 8 cm. wide, obtusish or *8-2-pinnate to short acute* more or less crenate-serrate and tomentose. The staminate plants furnish the florists pussy willows for Easter decoration, sparingly escaped around old nurseries.

Introduced and
Salix cinerea L. Gray Florists Willow. Very similar to *S. caprea* but leaves elliptical or elliptic-oblongate, acute at both ends and more tomentose. Similarly used, and escaped.

(37) *Salix humilis* Marshall. Upland Willow.

(45)
retyped for S. J. P.

Several-stemmed shrub 1-3 m. high; branchlets yellowish to brown, pubescent to glabrate; stipules lanceolate, acute, toothed, often deciduous; leaves oblanceolate to narrowly obovate, 5-10 or 15 cm. long, 1-2 or 3 cm. wide, acute to abruptly short-acuminate at apex, narrowed to the base, entire or sparingly undulate-crenate and revolute, dark green and often puberulent above, glaucous, somewhat rugose, and more or less gray-pubescent (becoming glabrate) beneath; ^{precocious} aments sessile or subsessile, oval-obovoid, 1.5-3 cm. long, 1.5-2 cm. wide; scales oblanceolate, 1.5-2 mm. long, blackish, long-villous; stamens 2, filaments long, free, glabrous; capsules narrowly lanceolate, rostrate, 7-9 mm long, gray-pubescent; pedicels 1-2 mm. long, hairy; styles 0.2-0.4 mm. long, equalling the divided stigmas. Scattered but common in open woods, ^{and} dry barrens ^{and prairies.} N. Fla. w. to e. N.D., s. to ^{E.} Tex. and Fla. Feb.-April. ^{and S. Que}

a. Var. *rigidiuscula* (Andersson) Robinson & Fernald.

Differ from the species in leaves narrowly oblanceolate to oblanceolate or subelliptical, acute to acuminate at both ends, becoming glabrate to glabrous in age.

With the species but increasingly common westward to n. cent. Neb.

b. Var. *keweenawensis* Farwell.

and

Differs from the species in lower height, /obovate to broadly obovate leaves, densely pubescent, the lower somewhat rotund. Mostly rocky ground in northern part of species range, s. to Ozark Mts., Mo.

(38)

29a

similar to *S. humilis* but
smaller in every way;

(46)

~~18~~ *Salix tristis* Aiton

Dwarf Upland Willow

Low, many-stemmed, leafy shrubs, 0.4-1 m. high; branchlets ascending, slender, brownish, pubescent; stipules wanting, or very small and deciduous; blades crowded toward end of twigs, narrowly oblanceolate, 2-5 cm. long, 7-10 or 12 mm. wide, acute at apex, tapering at base to a very short petiole, mostly entire, dark green and pubescent above, becoming glabrate, subglaucous and dense-gray-tomentose beneath, sometimes glabrate in age; aments ~~axillary~~ precocious, sessile, naked numerous, often crowded, 1-1.5 cm. long, or 2 cm. in fruit, oval or subglobular; flower scales oblanceolate, obtuse, 1-1.5 mm. long, blackish, villous; ~~stamens~~ 2, filaments free, *glabrous*; capsules narrowly lanceolate, 6-7 mm. long, gray-pubescent, pedicels 1-2 mm. long, pubescent, styles 0.2-0.3 mm. long, ~~stigma~~ equalling the divided stigmas.

Occasional in dry and often sandy uplands, roadsides, thicket-borders, mountain balds, etc., in the eastern half of the United States. March-April.
Of no value except as a soil holder and a provider of early pollen for bees.

(39)

0. *Salix Bebbiana* Sargent.

Beaked or Bebb Willow.

(47) rough draft for
Illus. Flor

Shrub, 1-few-stemmed, or small tree, 2-5 m. high; branchlets numerous, slender, divaricate, light- to dark-brown, the younger thinly short-pubescent; stipules none or small, semicordate, acute, denticulate; leaves from narrowly elliptical and acute to both ends to broadly oblanceolate or obovate oval, often rhombic, and abruptly short acuminate (apical rarely ovate), 2-5 or 7 cm. long, 1-2.5 or 3 cm. wide, margins entire, ^{at apex, rounded at base,} to shallowly undulate-crenate, somewhat revolute, dull green with subimpressed veins above, glaucescent to glaucous and prominently reticulate to rugose beneath, more or less short-pubescent on both sides, becoming glabrescent; petioles slender, pubescent, 4-10 mm. long; aments subprecocious to coetaneous, subsessile to short-leafy pedunculate, staminate subsessile, narrowed at base, 1-2 cm. long, stamens 2, filaments capillary, free, pubescent below (?); pistillate 3-6 or 7 cm. long, to 2 cm. wide and lax in fruit, on densely pilose bracted or leafy peduncles 0.5-2 cm. long; capsules lanceolate-rostrate, 6-9 or 10 mm. long, thinly short-pubescent, pedicels 3-5 ^{or 6} mm. long, slender, pubescent; styles almost obsolete; stigmas entire to deeply cleft, 0.1-0.3 mm. ^{0.1 or 0.2 mm.} long, scales lanceolate-oblong, acute, 1-2 mm. long, yellowish with reddish tip, thinly villous.

Moist to drier ground, mostly near streams, Lab. to N.J. and N. Md., w. to Alaska, Calif. and Ariz (?). May-June.

a. var. *capreifolia* Fern.Branchlets stout; leaves ovate, oval, or ^{larger &} obovate, beneath

Branchlets and leaves densely and permanently gray-tomentose; leaves like those of *S. caprea*, our introduced florist's willow. Nf. to e. Que. & N.S.

b. var. *luxuriens* Fern.

To 6 m. high; leaves scarcely rugose, to 10 ~~cm.~~ ^{mm.} long; pistillate aments to 3 cm. wide; capsules 9-12 mm. long, pedicels 5-8.5 mm. long. Gaspé Penin., Que. (Rimouski to Gaspé Cos.).

Var. *perrostrata* (Rydb.) Schn. The eastern specimens all are the species.

Var. *projecta* Fernald is from Newfoundland, one collection, probably hybrid.