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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. - *Salix desertorum* Richardson, a valid species.

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SALIX DESERTORUM RICHARDSON, A VALID SPECIES

By Carleton R. Ball

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Salix desertorum Richardson, Botan. Appendix, in Franklin, Narrative Journey Polar Sea, 753, 1823. Hooker, Fl. Bor.-Amer. 2:151, 1839. Andersson in part, is a doubtful species, or a subspecies of S. glauca, in Oefvers. Kon. Vet.-Akad. Förhandl. 15:127, 1858 (Nord-Amerika Pflanzter);-Andersson in Proc. Amer. Acad. Arts & Sci. 4:68, 1858 (Salices Boreali-Americanae); also reprint, separately paged, Willows of North America (p. 23), 1858. Hooker, J. D., in Trans. Linn. Soc. London 23:340, 1862 (merely listed, with reference to Andersson). Andersson (in part) in DC. Prodrum 16 (2):281, 1868 (excluding vars. stricta and fruticulosa). Rydberg (Caespitose Willows of No. Am.) in Bull. N.Y. Bot. Garden 1:272, 1899. Rydberg, Fl. Rocky Mtns. and Adjae. Plains, 197, 1917; ed. 2, 197, 1922. Schneider in Bot. Gaz. 66:331-334, 1918; in *ibid.* 67:36, 43, 1919;-in Jour. Arnold Arb. 3:69, 92, 100, 108, 1921.

S. desertorum Richardson, as understood by many American authors of the last century (Andersson, l.c. above, 1868; Britton and Brown, Illus. Fl. 1:500, 1896; Ball, in Trans. St. Louis Acad. Sci. 9:85, 1899, and others) really was partly or wholly S. brachycarpa Nuttall, as a result of Andersson's error (Andersson, above, 1858) in redescribing the latter under the name of Richardson's species.

S. glauca L. * S. desertorum Richardson. Andersson (in part), loc. cit. supra, 1858.

S. glauca glabrescens (Andersson) Schneider (in part, at least), in Bot. Gaz. 66:329, 330, 1918.

S. glaucops glabrescens Andersson (at least in part), in DC. Prodrum 16(2):281, 1868.

Discussion

Some 112 years ago, in 1923, Richardson published his Salix desertorum, with a brief description based on immature specimens collected by him at Fort Franklin on the MacKenzie River while on the Franklin Expedition. Because of the brevity of the original description (quoted below), the juvenile condition of the type material, and the obvious contradictions in describing the leaf shape, the species has never been properly recognized or adequately portrayed in its complete expression. To make matters worse, Andersson gradually transferred Richardson's name to a related but quite different plant [and applied other names to parts of Richardson's species.

Thereafter Andersson and other authors created new species based on Richardson's plant and on other closely related plants from the Arctic and the Rocky Mountains. The present problem is to determine the proper status and relationships of these species and varieties. It first becomes necessary to review the treatment of these by successive authors.

Hooker, in 1839, merely rewrote Richardson's description and cited the distribution as "From the Saskatchiwan (Drummond) to Fort Franklin (Richardson)." He gives no indication of which of Drummond's collections were referred to here.

Andersson, in 1858 and 1868, confused S. brachycarpa Nuttall with S. desertorum Richardson. He reduced the former name somewhat doubtfully to synonymy in the unrelated section Longifoliae. He then described the true brachycarpa under the name S. desertorum Rich., although also including desertorum, at least in part, in the description. In 1868, he appends three varieties, elata, stricta, and fruticulosa, to the species. The first, elata, probably refers to S. desertorum as collected by Drummond, though not necessarily in the Rocky Mountains. The last two certainly refer to S. brachycarpa Nuttall. The confusion thus created persisted until 1900, when Nuttall's name was restored.

Schneider, after study of fragments of the type specimen, and the cotype in the Tarrey Herbarium, drew up a description (l.c. p.333), of which the following is a translation.

Plant erect, $1\frac{1}{2}$ feet high (fide Richardson), resembling S. pseudolapporum in habit; branchlets more or less hairy, the new shoots densely white-silky-villous, the seasonal shoots somewhat glabrescent, the 1-year subglabrous or partly pilose, brownish or the completely glabrous purpurascens and shining, the older brownish-yellow; leaves of the type specimen very juvenile or scarcely half-developed, elliptical-lanceolate or obovate-lanceolate (described as exactly elliptical), apex obtuse or commonly more or less acute, the base sharply or gradually narrowed to the petiole, the upper entire or obsoletely denticulate toward the base, the lower glandular-subdenticulate throughout, glabrous above from the beginning or sparsely villous, with very indistinctly subincised nerves and reticulations, drying somewhat blackish, more or less discolored, glaucescent, or ^upilose beneath mostly (at least the lower) silky villous, but quickly glabrescent; petioles scarcely 5 mm. long; stipules none or small, or the larger lanceolate, denticulate, $1/3$ to $1/2$ as long as the petioles, thinly pilose.

Aments ~~castaneous~~ or subserotinus^o, terminating short leafy branchlets; staminate 2-3.5 cm. by 8 mm. densely flowered; scales oblong to obovate, apex obtuse to rounded, straw-colored to yellowish brown, glabrescent or thinly silky villous; stamens 2, filaments free, more or less pilose at base; glands 2, the ventral ovate-conic, the dorsal smaller, narrower; pistillate aments 1.5-3 cm. by 7 mm., bracts as in the staminate, short-villous but scarcely silky; ovary oblong-elliptical, white villous-tomentose, sessile or subsessile; style short (before anthesis), stigmas entire or bifid, gland 1, elongate-conic, half as long as the bract; capsule from ament of previous year elliptic-conic, subrostrate, about 6.5 mm. long.

Rydberg in 1917 recognizes 6 species in the complex under discussion, namely brachycarpus, desertorum, glaucoptus, pseudolappaceum, Seemannii, and subcordata, besides the very distinct S. macrocalliana and a supposed S. Austineae not identifiable but certainly not the Californian plant Bebb so designated.

Both glaucoptus and pseudolappaceum appear under two different categories; leaves grayish willow on both sides, less so on the upper, which includes also brachycarpus and Seemannii; and "Leaves glabrate or when young covered with white hairs parallel to the midrib", which includes also S. desertorum and S. subcordata.

Rydberg failed to appreciate that both S. desertorum and S. pseudolappaceum were described from single juvenile specimens. When he limits their leaf length to 4 cm. and capsule length to 5 mm., he makes no allowance for the natural increase of dimensions with maturity. When he uses these juvenile measurements to separate these two species from 3 others, S. glaucoptus, S. Seemannii, and an S. Austineae (not Bebb's), to which he

It is of interest ^{however} to note that the Underwriters are aware that state regulation ~~imposed~~ ^{brings about} lower ins. rates. The following statement ^{was made} in an editorial of the West. Union of Oct 1934 ~~was~~ addressed to agents in ~~the~~

~~and~~ the Dec. 1934 issue of this mag. p13. is a discussion of the Colorado rate regulation law pointing out the "sad tale" that since 1921 the average ^{five ins.} rate of C.O. had been reduced five times, and the concluding sentence of the article was "agents should ponder this illuminating record before going key-wire in support of the rate regulation law."

It is interesting to note that during the decade 1913-1922 ^{which} the rate of Cal. ~~was~~ ^{part in} to net premiums ~~of any state in the union~~ 38.7% ~~while~~ California was next ^{unhandled} 39.1%. The average gross rate for the ~~whole~~ ^{entire} country during this period was 50.1%. It is quite evident that ~~under~~ the introduction of the Colorado regulation act in 1921, was based Growth of Rate Regulation.

on the fact that ^{during} the decade previous, the gross profit of the ins. cos. ^{was} or excess of premium income received, over losses incurred ~~was~~ 61.3% ~~and the~~ ~~consequently~~.

assigns a maximum⁵ leaf length of 6 cm., and a capsule length of 8-8.5 mm. (except glaucous, at 5 mm. also), he draws a distinction not found in mature specimens. In both desertorum and pseudolappaceum the leaves reach 5-6 cm in length and the capsules exceed 6 mm.

Another diagnostic character used by Rydberg is color of the flower scales. According to how they are fuscous, black-tipped, black in S. desertorum, S. glaucosum and pseudolappaceum, but yellow or brown in S. "Australis", S. desertorum and S. Seemannii. He also records the leaves of S. desertorum as darkening in drying and those of pseudolappaceum as not doing so.

as a matter of fact, the flower scales of all species in this section are yellow at anthesis, become brownish with age and increasing glabrousness, and will become fuscous or blackish if not carefully dried in pressing, especially white young. The same is true of leaf discoloration and numerous specimens of S. pseudolappaceum from central Colorado have blackened leaves.

Trapp

II. Cal. Legislation Proposed in 1935

These

Calif. Com. of Ins. Agents have sponsored bills are
based primarily on the N.Y. laws, and ~~for regulation of~~ ^{for regulation of} ~~the~~ ^{the} ~~business~~ ^{business}
~~rate in Calif.~~ This bill provides, for

1. Estab. of rating bureaus ^{independently} by the ~~insurers~~ ^{insured} companies.
2. Non-discriminatory rates.
3. Reasonable rates.
4. Power of state ins. com. to revise rates not in accordance with these principles.

The sponsors advance the following reasons for adoption of their ^{measures}.

1-7.

The National Bd. of underwriters opposes these bills &
has replied to the ~~insurers~~ ^{insured} ~~companies~~ ^{companies} ~~stated that this~~ ^{a memorandum that} ~~points out~~ ^{the following reasons:}

1. Regulation is not needed for the following reasons:
1. Probably 97% of fire ins. of state now written at
auth. schedule rates. Thus ^{there is} no need for stabilization.
2. Rates ^{are} now generally uniform & non-discriminatory
except in a relatively small no. of cases.
3. The rating structure is now as scientific as business will permit.
4. Bd. of Fire Underwriters of the Pacific ^{are} ~~now~~ always willing
to consider & adjust any complaint on rates ~~making~~ ^{making}.
5. No state law can insure ins. cos. against impairment
of financial structure.
6. Keep competition & not state supervision will regulate.
7. State regulation has not prevented unscrupulous &
unethical practices.

S. pseudolappaceum. Branchlets brown, glabrous, the younger with grayish-white hairs; leaves petioled, the petioles 2 mm. long, gray pubescent; blades to 3 cm. long, 7 mm. wide, oblong-lanceolate to lanceolate, acute, equally narrowed to both ends, entire, dark green above, gray beneath, both sides ^{cloud} ~~cloud~~ with ~~short~~ appressed hairs, ^{thickly} midrib and primaries scarcely raised above, the smaller incised, more strongly developed beneath, the primary subparallel to the midrib. Aments (♂) coctaneous, short peduncled, (the peduncle 3 mm. long, pubescent, with 2-3 bract-like leaves), 1.5 cm. long, 5 mm. ~~broad~~ wide, oval. scales oval, acute, lower half clear brown, the outer half black, ^{thick} gray pilose. stamens 2, free, somewhat pubescent below, anthers oval; glands 2, the ^(hinterer) inner long and narrow from an oval base, fleshy (mit hinterer gespalten; the outer ^(vorderer) 2 small linear — (lappen) as long as the inner.

Type: Baker, Earle, and Tracy 3004² above timber line, Mt Hesperus, So. Colo., July 2, 1898 (Berlin Museum).

7
As von Seemen based his ^{S.} pseudo-
lappaceum on a single ~~immature~~ ^{southern Colorado} stam-
inate collection from the extreme sou-
thern end of the range of this complex,
we must assume that ~~some~~ proklate
specimens from that area, having sim-
ilar vegetative characters are the other
sex in this species. Fortunately abund-
ant material has been collected, ~~not~~
only in Colorado, but also in Utah,
Wyoming, Alberta and British Col-
umbia. It is possible to speak with
some assurance concerning the

Variations occur in three principal characters, blade-shape, pubescence, and pedicel length. The most abundant leaf form is oblanceolate, ^{but acute} with those on the seasonal narrowly shoots tending to have the base somewhat broader and therefore to become ~~some~~ suboblanceolate the widest above the middle. This is the typical desertorum and also pseudolappaceum. The transition

from this is to elliptical or broadly elliptical, or elliptic-lanceolate blades.

larger in size but still acute. or the apical actually ovate in form.
var. molleum

In the other direction there is a reduction to a small obovate or oboval, obtuse, blade, scarcely more than 2.5 cm long.

Case of the Indigent Sick, Aged & Handicapped

①

^{Institutional}
A. Indigent Relief.

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Sick and Aged.

of this time

1. Cholera.

A.
Zohrer
Hybrid

Andersson completely misunderstood S. brachycarpa Nuttall, doubtfully ~~reducing it to synonymy~~ ^{unrelated} in the section Longifoliae. It is equally evident that he described the true brachycarpa under the name S. desertorum Rich. in 1866 and again in 1868, although also including desertorum, at least in part, in the description. In 1868, he appends three varieties, elata, stricta, and fruticulosa, to the species. The first, elata, probably refers to S. desertorum as collected by Drummond, though not necessarily in the Rocky Mountains. The last two certainly refer to S. brachycarpa Nuttall. In 1868, Andersson included his doubtful new species, S. glaucops, composed of his former S. glauca villosa plus a new variety glabrescens, based on Bourgeau's numerous collections in the Rocky Mountains of southern Canada (Alberta and/or British Columbia.) He notes that the leaves are rigid, becoming glabrous above ~~xxxxxx~~ and glaucous beneath, with capsules distinctly pedicelled, showing a manifest transition toward S. desertorum.

Macdonn does not mention S. desertorum in his Catalogue of Canadian Plants in 1886 or 1890. Rydberg does not discuss the species but merely refers to the Richardson and Drummond collections. He correctly states, under S. stricta (And.) Rydb. (p. 273), that "Drummond No. 658, mounted on the same sheet [as Richardson's specimen] in the ⁸Tarrey Herbarium, is quite different [from S. brachycarpa Nutt.] and matches Richardson's specimen exactly."

Schneider discussed S. desertorum Rich. at some length in 1918, reviewing the previous literature, describing the material included in Drummond Nos. 658 and 660, the extremely juvenile type specimen collected by Richardson, ^{and H [oker], B [arratt] and T [arrey] No.} 70, which he states is identical with the type. He then redescribes S. desertorum from the type material.

10

Schneider discussed the Glauca ex-
tensively in 1918. In his treatment of S.
desertorum (pp. 331-334) he redescribed the
type but excluded the Rocky Mtn plant from
Richardson's species, regarding only one specimen
of Drummond's (No 660) ~~as~~ representative as pro-
bably ~~representative~~ with S. desertorum.

He regards most of the Rocky Mtn
material from Alberta and British Columbia
and the no other white leaves glauca
as S. glauca glabrescens (And.) Schneider,
a new combination of S. glauca glabres-
cens Andersson, based a collection by
Drummond. He maintains S. pseudo Cyp-
ripum, von Seemen as a distinct species
from confined to Colorado. In his key
(1919) he ascribes to it shorter leaves and
pedicels, allows long capsules, but no dif-
ference in flower scales or leaf puber-
cence. from glauca varietas

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no part of glauca varietas from glauca varietas

copy

ALB. 1375

ALB. 1375

From a survey of some hundreds of sheets of material collected in the Rocky Mountain region, from Colo and Utah to Yukon and Alaska, it seems evident that all may be referred to four species, omitting the very different S. mac-
calliana. These species are S. glauca L. from Alaska and adjacent Canada; S. niphobola Rydberg, from the eastern part of the same area; S. desertorum Richardson from the Mackenzie Basin southward to and in the Rocky Mountains to Colorado & Utah; and S. brachycarpa Nuttall, occupying much of the territory covered by the others except perhaps western and northern Alaska.

This grouping does away with the variation S. glaucoles Andersson, S. lingulata Andersson, S. pseudolapporum von Seemen, S. Wyomingensis Rydberg, and S. "Austiniae Bell" as interpreted by Rydberg. It requires the recognition of varieties of S. desertorum and S. brachycarpa.