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NOTES ON THE FLORA OF WESTERN NOVA SCOTIA
1921.

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THE results¹ of our exploration of Nova Scotia in 1920 were so gratifying that it seemed wise to continue the work, with Yarmouth as a center, during another season. Accordingly, Mr. Bayard Long and I devoted two months in 1921 to further investigation of the flora of western Nova Scotia. We were accompanied for all too short periods in July by Messrs. Edwin B. Bartram and Norman C. Fassett, and for a few days in September we had the active cooperation of Professor Horace G. Perry of Acadia University. The summer of 1920 had been abnormally wet, with the result that savannahs and lake-margins were often inaccessible or the characteristic plants of these habitats drowned or very tardy in development. In marked contrast, the summer of 1921 was phenomenally dry, in northwestern Nova Scotia to the point of extreme drouth; and the shores of undammed lakes were generally exposed, while small ponds had in some instances completely evaporated. We were consequently able to explore many places which were inaccessible in 1920, with the result that the ranges of a large proportion of the coastal plain types were extended and a good number of additions to our previous list of Nova Scotian plants discovered. Several regions, for example southwestern Lunenburg County, in the neighborhood of Bridgewater furnished days of thrilling botanizing and important discoveries, but they were all in general character so similar to our already described experiences of 1920, that they need not be related in detail. The itinerary of the summer, briefly stated, was as follows, the collecting being done by Mr. Long and myself unless otherwise stated.

July 13: Markland (Cape Forchu), Yarmouth Co., *Fernald, Bartram, Long & Fassett.*

July 14: Atwood Brook, Shelburne Co., *Bartram & Long.*
Upper Wood's Harbor, Shelburne Co., *Fernald & Fassett.*

July 16: Brazil Lake, Yarmouth Co., *Bartram & Long.*
Lake George, Yarmouth Co., *Fernald & Fassett.*

July 18: Annapolis Royal and Granville, Annapolis Co., *Fernald, Bartram, Long & Fassett.*

¹ RHODORA, xxiii. 89-111 (1921), 130-152 (1921), 153-171 (1921), 184-195 (1921), 223-245 (1922), 257-278 (1922), 284-300 (1922).

- July 19: Granville Center, Belle Isle, Lamb's Lake and Grand Lake, Annapolis Co., *Fernald, Bartram, Long & Fassett*.
 July 21: Tusket and Gavelton, Yarmouth Co., *Fernald, Bartram, Long & Fassett*.
 July 23: East Branch of the Tusket as far east as St. John (Wilson) Lake, Yarmouth Co., *Fernald, Bartram & Long*.
 July 25: Windsor, Hants Co., *Fernald, Bartram & Long*.
 July 26: Uniacke Lake and Five-Island Lake, Hants Co., *Fernald, Bartram & Long*.
 July 27: Truro, Colchester Co. and Shubenacadie Grand Lake, Halifax Co., *Fernald, Bartram & Long*.
 July 28: Darmouth and Armdale (Dutch Village), Halifax Co. *Fernald, Bartram & Long*.
 August 2: Welshtown (Birchtown) Lake, Shelburne Co.
 August 3: Roseway River, Shelburne Co., north to Jones Lake.
 August 4: Shelburne to Sable River, Shelburne Co.
 August 5: Harper Lake, Shelburne Co.
 August 8: Weymouth, Digby Co.
 August 9: Headwaters of Meteghan and Tusket Rivers, from Little Meteghan Lake to Wentworth Lake, Digby Co.
 August 10: Drainage of Sissiboo River, from Everitt Lake to Mistake Lake, Digby Co.
 August 12: West Branch of Tusket River, from Carleton to Parr Lake, Yarmouth Co.
 August 13: Gavelton (Butler's) and Vaughan (Tusket) Lakes, Yarmouth Co.
 August 15: Bridgewater, Lunenburg Co.
 August 16: Bridgewater, Hebb's Lake, Fancy L., Wallace L., etc., Lunenburg Co.
 August 17: Lahave River, north to Wentzell Lake; Mushamush River; Rhodes Corner; Blystner Lake; all in Lunenburg Co.
 August 18: Wile's (Oakhill) Lake, Feindel's L., and Rhodeniser L., Lunenburg Co.
 August 21: Yarmouth, Yarmouth Co.
 August 22: Markland (Cape Forchu), Yarmouth Bar and Overton, Yarmouth Co.
 August 23: East Branch of Tusket from Quinan to Canoe Lake, Yarmouth Co.
 August 25: Salmon (Greenville) Lake to Arcadia, Yarmouth Co.
 August 27: Shobel's Mt., Sandy Cove, Digby Co.
 August 28: Sandy Cove to Freeport, Digby Co.
 August 29: Lakes of Lequille and Liverpool Head Rivers, from Lamb Lake to Boot and Liverpool Head Lakes, Annapolis Co.
 August 30: Annapolis Royal, Annapolis Co.
 September 2: Sloane, Fanning, Skinner, Pearl and Crawley Lakes, Yarmouth Co., with *H. G. Perry*.
 September 4: Parr Lake, Yarmouth Co., and Cedar Lake, New Tusket, Digby Co., with *H. G. Perry*.
 September 5: Argyle Head to Belleville, Yarmouth Co., with *H. G. Perry*.
 September 7: Clyde River, from Port Clyde to Upper Clyde River, Shelburne Co.
 September 8: Harper, Western and Gold Lakes, Shelburne Co.
 September 9: Jordan River, from Jordan Falls to Lake John, Shelburne Co.
 September 10: Five-River (Morris) Lake and Bower's (Beaver Dam) Lake, Shelburne Co.

The more important range-extensions and observations of the summer are enumerated below; as in the previous enumeration the species new to Canada (37) are marked **, the additional ones (25) new to Nova Scotia.*

WOODWARDIA VIRGINICA (L.) Moore. Besides occurring as already reported, in Yarmouth and Queens Cos., the Chain Fern is characteristic of boggy shores and thickets northeastward through Digby Co. to Annapolis Co. (near Lamb's Lake; near Liverpool Head L.) It is frequent throughout Shelburne Co., sometimes, as at Harper Lake, reaching a height of 1.7 m.

W. AREOLATA (L.) Moore. Rather frequent in the Tusket Valley, north to Pearl Lake, Kemptville and east to St. John (Wilson) Lake; splendidly developed in the sandy alluvium and lake-margins of the Roseway River system, Shelburne Co., plants from near the head of McKay's Lake, Middle Ohio, measuring 7 dm. high.

ATHYRIUM ACROSTICHOIDES (Sw.) Diels. Rich woods on north Mt., Belle Isle, Annapolis Co.

A. ANGUSTUM (Willd.) Presl, var. *ELATIUS* (Link) Butters. Swampy woods on slopes above Lahave River, Bridgewater, Lunenburg Co.

THELYPTERIS SIMULATA (Dav.) Nieuwl. Reported from Yarmouth to Queens; but now known eastward to LUNENBURG Co.: knolls in boggy thicket by Wile's (Oakhill) Lake. Extending north in Yarmouth nad Shelburne Cos. to Kemptville and to Jones Lake, Roseway River.

THELYPTERIS BOOTHII (Tuckerm.) Nieuwl. At various stations in Shelburne and Lunenburg Cos.

CYSTOPTERIS FRAGILIS (L.) Bernh., var. *MACKAYI* Lawson. Local on the basaltic North Mt.: collected near Granville, Annapolis Co., and on Shobel's Mt., Sandy Cove, Digby Co.

WOODSIA ILVENSIS (L.) R. Br. Basaltic cliffs and ledges, Shofel's Mt., Sandy Cove, Digby Co.

SCHIZAEA PUSILLA Pursh. Additional stations indicate, with those already recorded, that the Curly Grass is to be expected in proper habitats in all acid areas in the province. Unrecorded stations are, for DIGBY Co.: forming a close turf with *Vaccinium Oxycoccus* and *Rhynchospora alba* at peaty border (many acres) of Tibert Lake, Freeport,—this, probably the most extensive station known for the species, within a few rods of the Bay of Fundy; wet sphagnous hollows in peaty savannah along The Brook, Central Grove. SHELBURNE Co.: depressions and knolls in sphagnous bog near Birchtown Brook; moist depressions in sandy *Corema*-heath and in wet sphagnous bog, Hope's Lot Barrens, Clyde River; wet mossy hollows in savannah east of Jordan Falls.

LYCOPodium INUNDATUM L., var. *BIGELOVII* Tuckerm. Reported as common in Yarmouth and Digby Cos. Abundant in Shelburne Co. and more locally in Lunenburg and Halifax Cos.

**SELAGINELLA RUPESTRIS* (L.) Spring. Basalt ledges, summit of Shobel's Mt., Sandy Cove, Digby Co.

**ISOETES MACROSPORA* Dur. Gravelly bottom of Clyde River, Middle Clyde.

I. ECHINOSPORA Dur., var. *BRAUNII* (Dur.) Engelm. Gravelly and muddy bottoms of brooks, West Branch of Tusket River, Havelock and New Tusket, Digby Co.

PINUS STROBUS L. The wind-swept and starved trees on the rocky barrens near Armdale, Halifax Co., have leaves only 2.5–5 cm. long and from a short distance away so strongly resemble *P. Banksiana* that such trees may have been the bases of unverified records of *P. Banksiana* from near Halifax.

THUJA OCCIDENTALIS L. As suggested in *RHODORA*, xxiii. 188 (1921), Cedar Lake, east of Corberrie, Digby Co., proves to have a characteristic growth of *Thuja* at its border.

POTAMOGETON OAKESIANUS Robbins. Probably common throughout the silicious areas; additional collections from Lunenburg and Hants Cos.

P. PULCHER Tuckerm. DIGBY Co.: quagmire-margin of Sears Lake, New Tusket (form with remarkably small and round emersed leaves). LUNENBURG Co.: brook-beds in peaty swale by Rhodeniser Lake, east of Bridgewater.

P. AMPLIFOLIUS Tuckerm. ANNAPOLIS Co.: shallow water of Young's Lake, North Mt., Belle Isle. DIGBY Co.: peaty cove in Little Meteghan Lake.

P. CONFERVOIDES Reichenb. SHELBURNE Co.: Swanburg Lake, Shelburne; Five-River (Morris) Lake.

In bog-pools near Argyle Head, Yarmouth Co., *P. confervoides* had developed, in early September, many winter-buds and tubers. The plants, which had fruited in July and early August, were nearly disintegrated, but their extensively creeping, filiform rootstocks bore short branches terminated by reddish fusiform tubers, while the old axils of the stems and the tips of the disintegrating branches bore fusiform dark-green winter-buds 0.7–2 cm. long, their leaves spreading-ascending.

P. DIMORPHUS Raf. At several stations in Digby and Lunenburg Cos.

SCHEUCHZERIA PALUSTRIS L. Quagmires of Shelburne Co.

***ALISMA PLANTAGO-AQUATICA* L., var. *PARVIFLORA* (Pursh) Farwell, Ann. Rep. Comm. Parks & Boulev. Detroit, xi. 44 (1900). The small-flowered and -fruited southern extreme. HANTS Co.: Windsor.

PANICUM DICHOTOMIFLORUM Michx. SHELBURNE Co.: dryish sandy beaches of Harper and Welshtown (Birchtown) Lakes.

P. VIRGATUM L., var. *SPISSUM* Linder, *RHODORA*, xxiv. 15 (1922). Besides the stations recorded in *RHODORA*, xxiii. 192 (1921), the following indicate a wide distribution in the province. *YARMOUTH* Co.: Goven and Gilfilling Lakes. *SHELBURNE* Co.: Bower's (Beaver Dam) Lake; McKay's and Jones Lakes, Roseway River. *LUNENBURG* Co.: Wentzell Lake.

P. DEPAUPERATUM Muhl., var. *PSILOPHYLLUM* Fernald, *RHODORA*, xxiii. 193 (1921) and forma *CRYPTOSTACHYS* Fernald, l. c. 194. Additional stations in Shelburne, Lunenburg and Halifax Cos.

P. SPRETUM Schultes. Additional stations are, for *ANNAPOLIS* Co.: Grand Lake and Liverpool Head Lake. *DIGBY* Co.: Journeay Lake, Weymouth. *YARMOUTH* Co.: Goven and Canoe Lakes. *SHELBURNE* Co.: Harper Lake. *LUNENBURG* Co.: Hebb's Lake, Bridgewater; mill-pond north of Blockhouse; Blystner and Rhodeniser Lakes.

***P. MERIDIONALE* Ashe. *YARMOUTH* Co.: cobbly beach of Gavelton (Butler's) Lake, Gavelton; first station east of Massachusetts.

P. LINDHEIMERI Nash, var. *SEPTENTRIONALE* Fernald, *RHODORA*, xxiii. 227 (1922). *LUNENBURG* Co.: dry pine and oak woods on steep slopes along Lahave River, Bridgewater.

***P. CLANDESTINUM* L. *YARMOUTH* Co.: rocky and gravelly thicket bordering Pearl Lake and dominant in thicket along Tusket (Kempt) River, Kemptville. *LUNENBURG* Co.: upper border of cobbly beach, Wentzell Lake. Heretofore unknown east of the Penobscot.

**ORYZOPSIS PUNGENS* (Torr.) Hitchc. Characteristic of dry barrens of Shelburne and southwestern Lunenburg Cos.

CALAMAGROSTIS PICKERINGII Gray. Sandy and peaty barrens, eastward at least to Halifax Co.

C. PICKERINGII, var. *DEBILIS* (Kearney) Fernald & Wiegand. Similar habitats, more common.

SPHENOPHOLIS PALLENS (Spreng.) Scribn. Near Wentworth gypsum quarries, Windsor.

SPARTINA ALTERNIFLORA Loisel., var. *PILOSA* (Merr.) Fernald. Apparently frequent on salt marshes from Yarmouth Co. to Annapolis Co. and presumably beyond.

PHRAGMITES COMMUNIS Trin. *ANNAPOLIS* Co.: a large colony in the ditch and on the adjacent railroad bank bordering the salt marsh west of Annapolis Royal; most of the stolons subterranean, but some superficial and reaching a length of 7.6 m. (25 feet).

DISTICHLIS SPICATA (L.) Greene. Salt marshes, Yarmouth Co. to Annapolis Co.

**POA SALTUENSIS* Fernald & Wiegand, var. *MICROLEPIS* Fernald & Wiegand, *RHODORA*, xx. 124 (1918). *ANNAPOLIS* Co.: brookside in mossy woods near Yoong's Lake, North Mt. Belle Isle.

GLYCERIA OBTUSA (Muhl.) Trin. Abundant eastward at least to Lunenburg Co.; extremely variable in stature, some colonies, in open

bogs, fruiting when only 1.5–2 dm. high (panicles 4–6 cm. long), others, as at the quaking margins of Harpers and Western Lakes in Shelburne Co., making dense stands 1.2–1.3 m. high (panicles 1.7–1.9 dm. long).

GLYCERIA LAXA Scribn. Eastward to Hants and Halifax Cos.

**FESTUCA RUBRA L., var. MULTIFLORA (Hoffm.) Aschers. & Graebn. Roadsides, Dartmouth.

AGROPYRON CANINUM (L.) Beauv., forma GLAUCUM Pease & Moore. Crest of barrier beach, East Jordan, Shelburne Co.

*A. CANINUM (L.) Beauv., var. TENERUM (Vasey) Pease & Moore, forma CILIATUM (Scribn. & Sm.) Pease & Moore, RHODORA, xii. 72 (1910). Thin open humus and basaltic talus, North Mt., Belle Isle (Annapolis); Shobel's Mt., Sandy Cove (Digby).

ELYMUS VIRGINICUS L., var. HIRSUTIGLUMIS (Scribn.) Hitchc. DIGBY Co.: wooded basaltic talus, Shobel's Mt., Sandy Cove.

CYPERUS DENTATUS Torr. Eastward at least to Lunenburg Co.; characteristic of sandy or gravelly shores.

ELEOCHARIS ROBBINSII Oakes. Widely distributed; new stations in Annapolis, Hants and Lunenburg Cos.

E. OLIVACEA Torr. Additional stations are as follows. YARMOUTH Co.: peaty quagmire-pools in sphagnous bog near railroad station, Argyle Head. LUNENBURG Co.: peaty quagmire-margin of Wallace Lake, Italy Cross.

*E. NITIDA Fernald. Exsiccated roadside gutter, North Mt., Belle Isle, Annapolis Co.

The occurrence of this little plant on the basaltic North Mt. is interesting, since all its other stations (in Newfoundland, Quebec, and northern New Hampshire) are likewise on basic or more or less calcareous rock.

**E. TUBERCULOSA (Michx.) R. & S. Wet sandy or peaty beach of Harper Lake, Shelburne Co.; the typical southern plant, heretofore unknown from east of Massachusetts.

SCIRPUS OLNEYI Gray. An additional station in Yarmouth Co. is at the border of a salt marsh along Argyle River.

**S. CAMPESTRIS Britton, var. NOVAE-ANGLIAE (Britton) Fernald. Border of salt marsh, Jordan Falls, Shelburne Co.; heretofore unknown east of southern Maine.

RYNCHOSPORA FUSCA (L.) Ait. Common eastward at least to Lunenburg and Hants Cos.

R. CAPITELLATA (Michx.) Vahl. Common or at least frequent. New stations in Digby, Annapolis and Shelburne Cos.

R. CAPITELLATA, var. DISCUTIENS (Clarke) Blake. Additional stations are, for SHELburne Co.: wet peaty margin of Harper Lake; upper border of cobbly beach of Bower's (Beaver Dam) Lake.

LUNENBURG Co.; upper border of gravelly beach, Feindel's L., west of Bridgewater.

CLADIUM MARISCOIDES (Muhl.) Torr., forma CONGESTUM Fernald, RHODORA, xxiii. 234 (1922). Sphagnous boggy swale bordering Fancy Lake, near Conquerall, Lunenburg Co.

CAREX STRAMINEA Willd. See RHODORA, xxiii. 235 (1922). Somewhat general, though often in only small quantity, on borders of savannahs along East Branch of Tusket R., Yarmouth Co.

C. BEBBII Olney. HANTS Co.: dryish swales near Wentworth gypsum quarries, Windsor.

*C. ADUSTA Boott. A single plant left growing among disturbed rocks by roadside. Armdale (Dutch Village), Halifax Co.; presumably more abundant somewhere in the neighborhood.

C. ROSEA Schkuhr. Damp thickets and clearings, North Mt., Granville, Annapolis Co.

**C. muricata L. Abundant in large stools, open pastured slopes near Wentworth gypsum quarries, Windsor.

**C. LENTICULARIS Michx., var. BLAKEI Dewey in Wood, Class Book, 755 (1861). Cobbly beach of Wentzell Lake, Lunenburg Co. Previously collected by J. R. Churchill at Ingonish, Cape Breton.

C. SWANII (Fernald) Mackenzie. C. virescens, var. Swanii Fernald. Occasional from Yarmouth Co. to Annapolis Co.

*C. panicea L., var. microcarpa Sonder in Koch, Syn. ed. 2: 879 (1844). Thin open humus by roadside on North Mt., Belle Isle, Annapolis Co.

C. glauca Murr. Reported by Macoun in 1888 from "dry clay banks on the railway cutting just outside of Windsor." Now a very abundant and variable species throughout the gypsiferous region about Windsor.

*C. ANCEPS Muhl. C. laxiflora, var. patulifolia (Dewey) Carey. ANNAPOLIS Co.: damp clearings and open rocky woods, North Mt., Granville; first authentic record from east of southern Maine, Macoun's earlier record being based on C. leptoneuria Fernald.

C. CRYPTOLEPIS Mackenzie. Somewhat local, Halifax and Lunenburg Cos.

C. SCABRATA Schwein. DIGBY Co.: rich thicket by brook, East Ferry.

C. OLIGOSPERMA Michx. Apparently general in the acid areas.

**C. hirta L. Abundantly naturalized on a sandy railroad bank, Annapolis Royal.

Although here recorded apparently for the first time from Canada, C. hirta was collected in 1912 in a pastured field at Charlottetown, Prince Edward Island, Fernald & St. John, no. 7106.

C. LUPULINA Muhl. YARMOUTH Co.: swale by Ogden Lake. LUNENBURG Co.: by brook flowing into Caribou Lake.

C. MICHAUXIANA Boeckl. SHELburnE Co.: boggy savannah along Tigney Brook, Sable River. HALIFAX Co.: sandy swale bordering Shubenacadie Grand Lake.

C. BULLATA Schkuhr, var. GREENEI (Boeckl.) Fernald. North-eastward to Annapolis Co. and east to Lunenburg Co.

XYRIS MONTANA Ries. Frequent eastward to Lunenburg Co.; sometimes, as at Wallace Lake, Italy Cross, reaching the phenomenal height of 4.2 dm. with heads 6-7 mm. in diameter.

(To be continued.)

The date of the July issue (unpublished as this goes to press) will be announced later.



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