

NOTES ON THE DISTRIBUTION OF *POTAMOGETON* SPECIES AND HYBRIDS IN NOVA SCOTIA

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(Received for Publication Jan. 26th, 1956).

ABSTRACT.

In addition to material collected in the summers of 1952-54 inclusive and preserved in the Acadia University Herbarium, Nova Scotian *Potamogeton* material from all herbaria known to have collections from Nova Scotia was examined. The distribution of 21 of the 24 species previously known from the province have been extended or more clearly defined. Five of the 29 species and varieties now known from Nova Scotia have not been reported previously from this province. An examination of the distribution maps of these species shows that they form five distribution patterns. Dissimilar distributions are thought to be mainly due to edaphic factors. The hybrid *X P. subnitens* was found to be more common than previous collections had indicated. Five previously unrecognized interspecific hybrids were encountered both in the field and in herbarium material.

During the summers of 1952, 1953, and 1954 field work sponsored by the Nova Scotia Research Foundation provided the opportunity to collect herbarium material of *Potamogeton* species in areas throughout the province of Nova Scotia. This material has been preserved at the Acadia University Herbarium. The present paper briefly describes the results of this collecting.

In addition to material collected by the ecology party headed by Dr. E. C. Smith and material collected by W. B. Schofield in Cumberland County, Nova Scotian material from the following herbaria was examined: Acadia University, Dalhousie University, Department of Agriculture at Ottawa, Gray Herbarium, McGill University, National Museum of Canada, Nova Scotia Agricultural College, Nova Scotia Museum of Science, University of Montreal, and Yale University.

Following the examination of the above a list of known collections from Nova Scotia was compiled from which a distribution map was plotted for each species.

A list of species known to occur in Nova Scotia is given below. Those species and varieties whose ranges have been extended considerably or whose distributions have been more

clearly defined are marked thus*. Those species or varieties previously unreported from Nova Scotia are marked thus **.

- P. filiformis* Pers., var. *borealis* (Raf.) St. John
- ***P. filiformis* Pers., var. *Macounii* Morong
- P. vaginatus* Turcz.
- **P. pectinatus* L.
- ***P. Robbinsii* Oakes
- **P. confervoides* Reichenb.
- **P. zosteriformis* Fern.
- **P. foliosus* Raf., var. *macellus* Fern.
- **P. Friesii* Rupr.
- **P. pusillus* L.
- **P. obtusifolius* Mert. & Koch
- **P. Berchtoldi* Fieber
- ***P. Berchtoldi* Fieber, var. *polyphyllus* (Morong) Fern.
- **P. Berchtoldi* Fieber, var. *acuminatus* Fieber
- **P. Berchtoldi* Fieber, var. *tenuissimus* (Mert. & Koch) Fern.
- ***P. Berchtoldi* Fieber, var. *lacunatus* (Hagstr.) Fern.
- **P. Spirillus* Tuckerm.
- **P. epihydrus* Raf., var. *Nuttallii* (C. & S.) Fern.
- **P. alpinus* Balbis, var. *tenuifolius* (Raf.) Ogden
- **P. alpinus* Balbis, var. *subellipticus* (Fern.) Ogden
- P. oblongus* Viviani
- **P. amplifolius* Tuckerm.
- **P. puleher* Tuckerm.
- **P. natans* L.
- **P. Oakesianus* Robbins
- **P. gramineus* L.
- **P. praelongus* Wulfen
- ***P. Richardsonii* (Benn.) Rydb.
- **P. perfoliatus* L., var. *bupleuroides* (Fern.) Farw.

The distributions of the species may be segregated into five classes.

(1.) Those characteristic of the more acid areas of the province: *P. confervoides*, (Map 6). (2) Those more characteristic of the less acid areas: *P. Robbinsii* (Map 5), *P. foliosus* var. *macellus* (Map 8), *P. Berchtoldi* (Map 12), *P. Berchtoldi* var. *acuminatus* (Map 14), *P. Berchtoldi* var. *lacunatus* (Map 16), *P. alpinus* var. *tenuifolius* (Map 19), *P. amplifolius* (Map 21), *P. gramineus* (Map 23), *P. praelongus* (Map 26), and X *P. subnitens* (Map 29). (3) Those species scattered throughout: *P. epihydrus* var. *Nuttallii* (Map 18), *P. Spirillus* (Map 17), *P. natans* (Map 24), *P. Oakesianus* (Map 25), and *P. Berchtoldi* var. *tenuissimus* (Map 15), (scattered but rare). (4a) Relatively rare species chiefly in areas of higher pH: *P. filiformis* var. *borealis* (Map 1), *P. filiformis* var. *Macounii* (Map 2), *P. vaginatus* (the identity of this material is in ques-

tion) (Map 3), *P. zosteriformis* (Map 7), *P. Friesii* (Map 9), *P. obtusifolius* (Map 11), *P. Berchtoldi* var. *polyphyllus* (Map 13), *P. alpinus* var. *subellipticus* (Map 20), and *P. Richardsonii* (Map 27). (4b) Relatively rare species, chiefly in acid areas: *P. pulcher* (Map 22), (5) Brackish species, occasionally with class two; *P. pectinatus* (Map 4), *P. pusillus* (Map 10), and *P. perfoliatus* var. *bupleuroides* (Map 28).

There is no reason to suppose that the dissimilar distributions of the species in the province is due greatly to other than edaphic factors.

Although some species are easily recognized even in juvenile stages, other species may at times be difficult to separate even with mature material. The juvenile stages of *P. natans* and *P. Oakesianus* are often difficult or impossible to separate. *P. amplifolius* is usually a distinct species. Two collections of this species were made which resembled *P. pulcher* in some respects. It is of interest that these two stations are near two known stations of *P. pulcher*. A hybrid was suspected but for lack of more conclusive evidence the material was placed with *P. amplifolius*. The extreme variation of *P. perfoliatus* var. *bupleuroides*, especially in inland waters, is such as to render the identity of some material uncertain. The anatomy of the stem internode, so useful in the identification of other broad-leaved species, is of little value in the above cases.

The identification of sterile specimens of linear-leaved species is often difficult. *P. Friesii*, when mature, is readily recognized by the presence of slightly arching clavate peduncles which are longer than those of *P. foliosus* var. The typically five-nerved leaves of this species are often replaced in Nova Scotian material by three-nerved leaves. *P. pusillus* and *P. Berchtoldi* are normally quite distinct. Some specimens have been found which resemble *P. pusillus* in all characters except the stipules, which appear to be convolute. Although such material was placed with *P. pusillus* its true position is not clear. The varieties of that very variable species, *P. Berchtoldi*, are indefinite in separation and may be a result of response to ecological conditions.

During the course of this investigation apparent hybrid material was encountered both in the field and in previously collected herbarium material. A similar condition has been found in many of the other areas which support a rich *Pot-*

amogeton flora (Ogden, 1943). Usually the identity of one parent is relatively clear. The anatomy of the stem internode (Ogden, 1943) is of great value in deciding on the origin of hybrid material, especially among the broad-leaved species. Despite this aid the conclusions which may be reached are seldom satisfactory.

With one exception, that of a hybrid between a variety of *P. Berchtoldi* and *P. perfoliatus* var. (Ogden, 1943), no verified hybrids between linear-leaved species have been reported (Fernald, 1932). The uncertain relative merit of the diagnostic characters separating these species is perhaps one reason for the lack of recognized hybrids. For example: collections with peduncles and inflorescences characteristic of *P. pusillus*, but with apparently convolute stipules, would suggest a hybrid between *P. pusillus* and *P. Berchtoldi* but were placed with *P. pusillus*. Collections with peduncles and inflorescences resembling *P. Friesii*, but with three-nerved leaves instead of the usual five, would suggest a hybrid of *P. Friesii* with some other species. Such collections were placed with *P. Friesii*.

The following previously unrecognized interspecific hybrids were encountered in Nova Scotia *Potamogeton* material: *P. obtusifolius* X *Berchtoldi* var., *P. epihydrus* var. *Nuttallii* X *P. alpinus* var., *P. alpinus* var. X *amplifolius*, *P. amplifolius* X *gramineus*, *P. praelongus* X *perfoliatus* var.

P. obtusifolius X *Berchtoldi* var.

Material which seems to be of this origin is known from three of the six stations from which *P. obtusifolius* is known, and from a second inlet of Lake Ainslie several miles from the Black River station. It displays several features more prominently than either of the parents. The marginal leaf veins are more strongly developed, the leaves darker and more rigid than in either parent. Winter buds, which are well developed in the Black River material, greatly exceed the dimensions of *P. Berchtoldi* and approach those of *P. obtusifolius*. The Grand Etang material has peduncles up to 9 cm. long with a somewhat interrupted spike and with fruits not unlike *P. Berchtoldi*. The St. Joseph material presents a series of specimens approaching the hybrid on one extreme and approaching *P. Berchtoldi* on the other. This material may be the progeny

of this fertile hybrid but more probably is the result of a back-cross with a variety of *P. Berchtoldi*.

Inverness County: Little Lake, Grand Etang July 21, 1939
M. V. Roscoe and Aug. 3, 1939 M. V. Roscoe;

Hay River, West Lake Ainslie SCBSB¹ No. 3885; J. Erskine
No. 50.899; STWS No. 6985; Black River, near Lake Ainslie
SSTWS No. 7725; SSTWS No. 8707.

Antigonish County: River, near lake, St. Joseph SWB No.
13230; SWB No. 13227.

P. epihydrus var. *Nuttallii* X *alpinus* var.

This material most closely resembles *P. alpinus* var.
tenuifolius. Peduncles, shape of upper leaves and in some
ways the submerged leaves suggest *P. epihydrus* as the other
parent.

Pictou County: Lagoon of Moose River with *P. alpinus* var.
tenuifolius, *P. epihydrus* var. and *P. amplifolius*, Garden of
Eden SSTWS No. 7697; SWB No. 13214.

P. alpinus var X *amplifolius*.

Material from the South River and Tatamagouche colonies
more closely resembles *P. amplifolius*. The Blue Mountain
material might be confused with *P. alpinus* var. *tenuifolius*
on the basis of external morphology.

Antigonish County: Lagoon of South River, 1.5 miles south
of Fraser Mills, STWS No. 7635; SWB No. 13208.

Pictou County: Pond, Blue Mountain, SECS No. 1244;
SWB No. 13212.

Colchester County: Tatamagouche River, 4 miles south of
Tatamagouche, SWB No. 11606.

P. amplifolius X *gramineus*.

P. gramineus features are more pronounced in this hybrid,
with the exception of the Cumberland County material, which
more closely resembles *P. amplifolius*.

¹The designations used refer to the following field parties: SCBSB E. C. Smith, E. H. Collins, J. M. Bruce, D. R. Sampson and F. C. Bent; SECS E. C. Smith, D. S. Erskine, E. H. Collins and W. B. Schofield; STWS E. C. Smith, J. C. Taylor, D. H. Webster, and L. B. Slipp; SSTWS E. C. Smith, W. B. Schofield, Taylor, Webster and Slipp; SWB E. C. Smith, D. H. Webster and P. A. Bentley.

Pictou County: Black Brook Lake, East River St. Mary, Aug. 3, 1946 Gorham; SWB No. 13357, No. 13362 and No. 13363.

Cumberland County: Wallace River margin and on muck of bank near Wallace Bridge, W. B. Schofield No. 5424.

Kings County: In lagoons and in current of Gaspereau River from Melanson to above Gaspereau, Aug. 28, 1949 J. Erskine and D. Erskine; Sept. 25, 1949 J. Erskine and W. B. Schofield; Webster No. 157 and No. 165.

P. praelongus X *perfoliatus* var. *bupleuroides*.

Leaves not strongly unlike *P. perfoliatus* var., stipules rather coarse. Material from St. Joseph, Antigonish County may belong here, however the stem anatomy is nearly typical of *P. perfoliatus* var.

Cape Breton County: Blackett Lake, SWB No. 12999.

ACKNOWLEDGEMENTS.

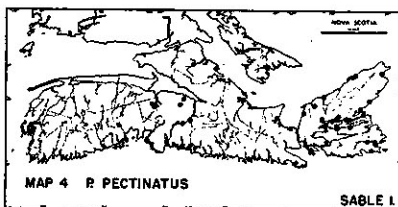
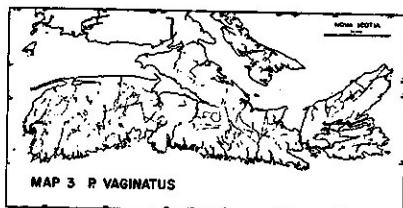
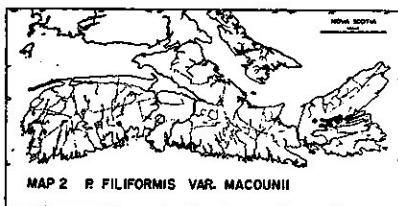
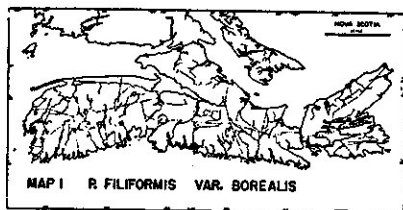
The author wishes to express his indebtedness to the other members of the field parties of the summers 1952, 1953, and 1954 without whose interest and assistance this study would have been far less complete. The collections from Cumberland County are due chiefly to the efforts of W. B. Schofield who generously gave permission for the publication of his *Potamogeton* data here.

Special acknowledgement is made to Dr. E. C. Smith, who supervised this study, for his continued advice and assistance.

The author is in debt to Dr. E. C. Ogden who identified a series of specimens. He would also like to thank the curators of the herbaria who co-operated by making their material available.

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SABLE I.

