

what coriaceous leaves" while the older author Hermann writing in 1698 described them as "tactu aspera, rigida."

While the change required may be distasteful it is quite evident that we must give to the plant which has been called *Solidago patula* Muhl. the name *Solidago rigida* L.

MAPLEWOOD, NEW JERSEY.

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## POGONIA AFFINIS IN MAINE.

EDWIN H. EAMES.

SPECIMENS of *Pogonia affinis* Aust. have been distributed with the following data: "Norway, Oxford County, Maine, 20 Aug. 1923. Dr. E. H. Eames and Dr. C. C. Godfrey."

This appears to be the first collection in the State and is about 70 miles northeast of the only station recorded<sup>1</sup> from New Hampshire, near Holderness, where three specimens were found. It lacks a few miles of reaching the same latitude as the most northerly station recorded, at Burlington, Vermont, where apparently one specimen was found.<sup>2</sup>

This Maine colony was so extraordinary in some ways as to merit detailed record. About 35 plants were found within an interswamp area of approximately half an acre of fairly well drained, partly very open woodland of beech and red maple, merging upon one side into a scattering growth of *Arbor Vitae*—common in the general locality—which at one point, within a few meters of the nearest *Pogonia*, became a swamp characteristic of the species, where were many well-fruited specimens of *Microstylis monophyllos* (L.) Lindl.

The area was largely free from underbrush or vegetation of any kind. The soil was sandy loam or in places clay-loam, topped with a moderate but variable layer of leaf-mold and nowhere more than a meter above the adjacent swamps, nearly level and barely moist.

The plants generally were widely scattered but at the highest point, a mound about the base of a tall badly decayed beech trunk well perforated by woodpeckers, was a combination offering unusually favorable organic soil conditions as shown in its support of a very interesting growth of the *Pogonias*—a cluster of eleven stems within

<sup>1</sup> RHODORA, xix: 235. 1917.

<sup>2</sup> Torreya, ii: 143. 1902.

an area no larger than one's palm, with two outlying stems about 18 and 24 cm. distant. All of these were apparently then or originally connected by subsurface roots. Eight of these bore fruit—none mature although the capsules when fresh were of mature size—mostly in pairs, with some woody-fibered remnants of fruiting stems of the preceding year. It may be noted that such old stems, still connected or lying in such position as to show origin, sometimes show but one capsule on a present year's two-capsuled stem and vice-versa. Also a rhizome with three stems may show but one for the preceding year or otherwise, erratically.

The height from roots to leaves, as measured in the herbarium, is 30 and 32 cm. for two fertile and 36 cm. for one sterile stem from the same rhizome. Most of the others were little less.

The leaves measured up to  $9.8 \times 4.6$  cm., usually with much variation in every verticil; the combined peduncle and capsule from 4.1 to 4.8 cm. in length, of which the capsular portion varies from 2.8 to 3.4 cm.

The roots in this clump were numerous, about 70, all rather erratic, rarely branching, and mostly of remarkable length, varying from several to 18 cm. for those with apex complete. This great mass of roots may be accounted for by the special conditions which included much greater depth of organic matter and the fact that many roots penetrated the underlying soil of sandy clay. Generally the roots in this species are without branches but when these do appear they may be very sparingly disposed as strictly lateral, opposite or forked to appear nearly opposite, or apparently dichotomous.

Vegetative reproduction occurs to a very limited extent and originates in nodes formed upon more or less horizontal roots. This process seems to be slower and less successful than in *P. verticillata* and generally is a very inefficient factor in extending a colony. In both species several years elapse between forming nodes and self-perpetuating plants, with more added for the attainment of mature characters.

These nodes vary from 0.3 to 20 cm. from the parent stem—in one case 0.8 (had borne a stem a year or two earlier as shown by shreds of it), 2.4 and 5.2 cm. distant, the last with a close series of roots: another 0.3, 2.5 (bore a stem at least three years earlier), 7.8 and 19 cm. distant with a close knot of roots from the latter.

But united *plants* seem to be rarely collected because of their scarcity, depth in the soil or difficulties of an extraneous nature.

The true rhizome, as here interpreted, from which the annual stems arise, is usually perpendicular or oblique and has yearly accretions of only 0.2 to 0.3 cm. from a bud or buds well formed before the dormant condition and sometimes well before fruit is mature.

The bud, in unusually robust specimens, may become 1.5 cm. long in its season of origin.

The rhizome is rarely 4 cm. long in specimens observed and such may display distinctly several shredded remnants of earlier stems with indications of as many more.

Approximately one-third of the plants in this colony were sterile at the time although some of these may have produced flowers. Sterile plants do occur in about that proportion as noted at flowering time in a colony at Stratford, Connecticut, found by Charles K. Averill in May, 1887. Observations there during a number of years have shown years when no plants appeared and others with varying numbers to about eight, the latter when the colony had been least disturbed.

Two-flowered stems are frequent and rarely two such stems closely associated on the same rhizome, etc.

Most of the data obtained at the Stratford station fairly coincide with the recorded observations of E. J. Grimes in Virginia.<sup>1</sup>

The flowers in their early virile state seem better described as pale green with enough of bloom about the parts to make difficult a color name. The really "yellowish" green described in literature appears only as the flowers age and may become pronounced in their final stage. In Stratford the period of flowering always occurred between mid-May and mid-June, scarcely three weeks in any season. The fruit there matured in October but was scarce.

The bloom covering the plant varies in intensity being more pronounced where exposure to sunlight is greatest. There is something about this color together with the surroundings that about as effectually conceal the plant as anything in its habitat, even when standing alone.

In *P. verticillata* this bloom is much less apparent but there is much of the same color effect and it also is paler in strong light. In this species, while somewhat similar to the other, the root system is greatly extended and usually nearer the surface. At times there is little difficulty in obtaining many meters of a single root, usually showing nodes or branches quite distant, commonly half a meter or so.

<sup>1</sup> RHODORA xxiii: 195-7 and xxiv: 149.

It may readily be observed that the branching of such roots is a prolific source of new stems. Entire colonies, sometimes of great extent, seem to owe their existence to this habit. Upon one old rhizome of a sterile plant there are shreds representing eight stems covering as many years, all within a space of 2 cm., together with about a dozen long roots.

A feature of much import to the field student is the intimate association of both species of *Isotria* with beech trees. This was remarked nearly 40 years ago in the Stratford station for *P. affinis*, where the plants grew only under a beech, also at another station in the same town which yielded a solitary fruiting plant.

Later observations have shown the same environment to be very constant with *P. verticillata*, the few exceptions being, it would seem, more apparent than real, due to disturbed conditions. Hemlock often occurs in these areas and, with beech, is generally noted in the literature as a component of the woodland, but the former seems to be merely incidental.

Some very impressive instances might be cited, especially a wide-spreading very low-branched beech bordering a grassy cartpath in a woodland made up chiefly of chestnut. The ground area immediately below these branches was actually a solid mosaic of *P. verticillata* foliage which stopped almost abruptly at its outer borders—not another specimen anywhere in the locality. Commonly, however, conditions are such that the humus nearby contains decomposed beech leaves in sufficient amount to meet the needs, especially in colonies long established. With the beech habitat in mind it has always been easy to find these Pogonias if they were to be found at all and it was only because of this that *P. affinis* was found in Maine.

There is no other clue, as both species occur in dry as well as wet habitats, and *P. verticillata* as well on hills as in low swampy places. The only accessory desiderata seem to be comparative or even absolute freedom from underbrush and even of other herbaceous vegetation, together with comparatively light shade. *Medeola* and *Arisaema triphyllum* are associates in certain instances and both make it much more difficult to find any Pogonias.

BRIDGEPORT, CONNECTICUT.



Eames, Edwin Hubert. 1926. "Pogonia affinis in Maine." *Rhodora* 28, 31–34.

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