

## PRENANTHES MAINENSIS:

NOTES ON THE MORPHOLOGY, TAXONOMY AND DISTRIBUTION  
OF THIS HYBRID FORM.

By BRO. M. VICTORIN, Longueuil College, Longueuil, Que .

Up to the present time very little attention has been devoted in this country to the study of natural hybrids. The subject, however, is of the utmost importance, not only to students of Mendelism, but also to the average systematist. "In fact," says De Vries, "the majority of authors agree that systematic and sexual affinity are essentially parallel, as they are really no more than two manifestations of one and the same thing; but we have not yet succeeded in explaining the apparent exceptions to this parallel." (\*) If some light is ever to be thrown on the subject, it will doubtless be through observations on natural hybrids, in widely separated groups of the plant kingdom.

We have in a previous paper (†) studied quite extensively a cross of two distant species of *Lysimachia* : *L. terrestris* (L.) B.S.P. x *L. thyrsiflora* L., and hinted that the recently proposed genus *Naumburgia*, created to account for *L. thyrsiflora*, was not founded in nature, since the plant hybridizes freely with other *Lysimachia* species. The writer knows such hybrid to occur constantly in Chateauguy, Que., and Professor M. L. Fernald, of the Gray Herbarium, states that he has collected it in Maine, and also in Prince Edward Island.

The present paper will deal with another interesting hybrid in the genus *Prenanthes* (Compositæ), which is of rare occurrence and has never received close study.

In a detailed botanical survey conducted during the summers of 1913 and 1914 along the coastal portion of the county of Temiscouata, Que., our attention was called to various forms of *Prenanthes* growing intermingled in a salt marsh at Anse à Persi, near Rivière-du-Loup. Specimens were collected and a preliminary study showed the bulk of the crop to be typical

\*Hugo de Vries, "Mutation Theory," II., 593-599 (English translation).

†Fr. Marie Victorin, "Notes sur Deux Cas d'Hybridisme Naturel." Nat. Can. XXXIX., 177-189.



but stunted *P. trifoliata* and *P. racemosa*, whilst the rest appeared somewhat puzzling and intermediate between the two. We determined to prepare a large series of specimens to facilitate a thorough study, but, alas! the next morning the marsh was found neatly mowed, and the *Prenanthes* were no more.

Later study and comparison with type in the Gray Herbarium have shown our doubtful forms to be equivalent to *P. mainensis* Gray. There can be hardly any doubt now that the so-called *P. mainensis* is a natural hybrid: *P. racemosa* x *P. trifoliata*. Gray's text reads as follows: "About two feet high, leafy up and into the panicle; leaves nearly those of *P. racemosa*, but thinner and less glaucous; the radical ovate, commonly with abrupt or rounded base; upper, subtending clusters of the interrupted narrow thyrus; heads all drooping both before and after anthesis, resembling those of the following species (*P. virgata* Michx). Shore of the St. John's River at St. Francis, North Maine, *Pringle*. Growing with or near *P. racemosa*. And a looser form of the latter, "very common on the St. John's River," (*Goodale*) is somewhat between the two; so that this may be a hybrid between *P. racemosa* and *P. serpentaria*."(\*)

It should be borne in mind that when these lines were written (1886), *P. trifoliata* had not yet been separated from *P. serpentaria*. From the description of Gray it appears that the plant named by him *P. mainensis* was an extreme form of the hybrid, differing from the "looser form of *P. racemosa*" only quantitatively, and that both are but distant terms of a Mendelian series.

We will now give the result of our own study based on the comparison of 15 specimens of *P. racemosa*, 20 of *P. trifoliata*, and 8 of *P. mainensis*.

#### STEM.

An important reduction in size is first noticeable, which is doubtless a response to the semi-halophytic habitat. In normal conditions *P. racemosa* reaches fully 2m., whilst here its maximum is 30cm. *P. trifoliata* generally grows to a height of 1.50m., and exceptionally to 3m.; in this locality no specimen higher than 32cm. was found.

It is well known to breeders, as well as to students in hybridism, that crosses between nearly related forms are more vigorous than either parent. The following tabulation will emphasize the law as applied to the present case:—

\*Gray, Asa, "Synoptical Flora," I., 433, 1886.



COMPARED SIZE OF  
*P. racemosa*, *P. trifoliata*, *P. mainensis*.

Height in cm.	RACEMOSA		TRIFOLIATA		MAINENSIS	
	Number	Product	Number	Product	Number	Product
15	2	30	..	..	..	..
16	..	..	..	..	..	..
17	2	34	2	34	..	..
18	2	36	..	..	..	..
19	2	38	2	38	..	..
20	..	..	4	80	..	..
21	2	42	1	21	..	..
22	..	..	1	22	..	..
23	..	..	4	92	..	..
24	3	72	1	24	..	..
25	..	..	..	..	..	..
26	..	..	2	52	..	..
27	1	27	..	..	1	27
28	..	..	1	28	..	..
29	..	..	1	29	1	29
30	1	30	..	..	..	..
31	..	..	..	..	..	..
32	..	..	1	32	1	32
33	..	..	..	..	..	..
34	..	..	..	..	..	..
35	..	..	..	..	..	..
36	..	..	..	..	1	36
37	..	..	..	..	..	..
38	..	..	..	..	1	38
39	..	..	..	..	1	39
40	..	..	..	..	..	..
41	..	..	..	..	2	82
Total.....	15	309	20	452	8	283
Mean.....	20.6 cm.		22.6 cm.		35.3 cm.	

The series of specimens is not numerous enough to show very clearly a curve of Quetelet, but what stands prominently is the fact that *P. mainensis*, the hybrid, is taller by 63 per cent. than the parent species (figuring on the means). What are the causes of this increased luxuriance? They are yet a matter of research. Tischler and Jost (\*) agree that it is probably due to a "poisoning" effect of one species on the other.

#### LEAVES.

We have not been able to see the radical leaves of *P. mainensis* of which Gray makes so much in the above-mentioned description, but we observe that the lowest stem leaves taper into a winged petiole which sometimes reaches 10 cm. Most re-

\*"Arch. Zellsforschung," I., 33-151, 1908.



P. TRIFOLIATA

P. MAINENSIS

P. RACEMOSA



{Leaves and bracts of *Prenanthes trifoliata*, *P. racemosa* and their hybrid *P. mainensis*. Bracts much enlarged.



markable is the tendency some of the leaves exhibit to lobate after the manner of *P. trifoliata*. But this tendency is checked in some way in its action, as it succeeds in affecting only one-half of the leaf, thus showing that the elementary characters of *P. racemosa* are dominant over those of *P. trifoliata*.

In the three plants the leaves are bordered with glandular teeth.

#### FLOWER AND FRUIT.

The color of the ray-flowers of *P. mainensis* is evidently intermediate between the pale purple of *P. racemosa* and the straw yellow of *P. trifoliata*.

The inner bracts of the involucre are about the same in outline in the three plants, but they differ much in the amount of pubescence. In *P. trifoliata* these bracts are perfectly glabrous; in *P. racemosa* they are covered with very long ribbon-like flattened hair tipped with a spherical gland; *P. mainensis* shows a pubescence much like that of *P. racemosa*, but very scarce, the evident result of the fusing of opposed characters.

The bract of *P. mainensis* ends in a somewhat fimbriate obtuse point bearing septate hair, very different from those described above; they are much shorter, and consist in a single line of hyaline cells. The bracts of *P. trifoliata* and *P. racemosa* show the same peculiarity.

The bracts of *P. racemosa* and *P. mainensis* are covered with truncate conical papillae, inclined towards the point of the bract. Every cell being papilla-bearing, their number can be estimated in round figures to 10,000 per sq. mm. None of the twenty specimens of *P. trifoliata* from the halophytic habitat of Anse à Persi showed these papillae, but we found them in smaller numbers, and different in form, on a giant specimen collected on the quartzite rocks of the "Gros Pelerin," one of the islands off the Kamouraska coast.

The akene of *P. mainensis* is slightly longer than that of *P. racemosa*, and much longer than that of *P. trifoliata*, even when giant specimens of the latter are considered.

#### DISTRIBUTION.

We do not believe that *P. mainensis* has been before noted outside of the type station on the St. John's River, neither do we think it can be found frequently on account of the distribution of the parent species and their different habitat.

*P. racemosa* is very widely distributed in North America, from Eastern Quebec to Alberta, whilst *P. trifoliata* is distinctly eastern and boreal. In the Province of Quebec there is no sure record west of "Gros Pelerin" island, though some of Macoun's



localities under *P. serpentaria* may belong here. The distribution of *P. trifoliata* is therefore restrictive as regards the possible occurrence of *P. mainensis*.

Moreover, *P. racemosa* is a riverside and prairie species, and *P. trifoliata* a plant with xerophytic preferences, so that the two are rarely to be met together, except in such habitat as the halophytic, or more exactly the semi-halophytic, where water is to be found, but which at the same time is physiologically dry.

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### BIRDS OF ALGONQUIN PARK.\*

BY W. E. SAUNDERS, LONDON, ONT.

On August 11th, 1915, Mr. E. M. S. Dale and the writer started from Joe Lake on an investigation of the birds and mammals, chiefly the former, of Algonquin Park. It is probably unnecessary to give any description of the character of the country, in which spruce, pine, poplar and birch alternate, as is usual in the northern parts of Ontario.

The fauna of this region should be more northern than would be called for by latitude only, because of the altitude, which is nearly two thousand feet.

After packing our dunnage in bags and loading it into the canoe, we got away to a favorable start. During the first day we saw nothing of moment until we reached Island Lake, where our ears were assailed by the calling of two hawks, which proved to be Goshawks. Their calls were of rather a peculiar character. They were in descending thirds, as is the case with the Marsh Hawk, and more particularly the Sharpshin, but they had two different calls. In one the phrases were repeated about every second and a half, and in the other, which was about half an octave higher, they were repeated about four times each second. We paddled over near where they were sitting in some dead timber, and one of them flew over us with a scissor-tail effect, opening and shutting the tail.

The first night's trapping for mice yielded nothing but one *Sorex personatus* and several of the northern deer mice. While passing over the portage and through the Otter Slide lakes it rained so hard that we sought shelter at the point where the creek leaves for White Trout lake, and spent the night in a tumbledown lumberman's building. Next morning we had a call from an Olive-sided Flycatcher, of which we

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\*Read at the December meeting of the McIlwraith Ornithological Club.



Marie-Victorin. 1916. "Prenanthes mainensis. Notes on the Morphology, Taxonomy and Distribution of this Hybrid Form." *The Ottawa naturalist* 29(11), 140–145.

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