A STUDY OF THE GENUS VIOLA

IN THE DOUGLAS LAKE REGION

By

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wild

The violets are among the

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INTRODUCTION

The results of field and laboratory study on the genus Viola in the Douglas Lake Region during the summer of 1941 are presented herewith.

The plants studied were collected from as many habitats as possible, in order to show the effects of various ecological factors such as light, shade, moisture, type of soil, et cetera. Most of the plants were identified by their leaves, roots, and cleistogamous flowers, since with the exception of one species, their flowering season was over when the study began.

The violets are among the most admired of native wild plants, yet one of the most difficult for botanists to name. Some species hybridize freely and the resultant intermediate forms are difficult or impossible to identify with certainty.

Ezra Brainerd, one of the foremost students of violets, studied the violet hybrids of North America, and described many species and hybrids. Recent authors do not recognize some of the species proposed by Brainerd, since they do not seem to be well founded.

DISCUSSION

The Violaceae are a small family containing about 18 genera and 450 species, which are widely distributed through the temperate and tropical regions of both hemispheres.

The principal genera are Viola, Hybanthus, and Rinorea. Three hundred or more species of Violets (Viola) are distributed over the temperate region of the world. Hybanthus with fifty or more species, is tropical. Hybanthus is found in the southern part of Michigan, but not in the Douglas Lake Region. Rinorea comprises forty or more species of tropical trees.

Most of the species of Viola are herbaceous annuals or perennials, with alternate (rarely opposite), simple, entire, lobed, stipulate leaves. The leaves change their shape through the growing season, usually becoming larger. In Viola the stipules may be large and leaf-like, or inconspicuous. The flowers are irregular, mostly perigynous, rarely unisexual and polygamous, occasionally dioecious, and 5-merous except the gynoecium, which is usually 3-merous. There are five sepals, five petals, and five stamens. The members of each whorl are generally free but may be connate at the base. The sepals are green and usually uniform in size. The petals are often sac-shaped

or spurred. The stamens converge around the ovary, and the two lower ones are spurred or appendaged. The filaments in some species are united in a tube or sometimes are very broad and thin. The ovary is 1-celled, formed by the union of three carpels, of which the odd one is anterior. There are three parietal placentae. The style is terminal and ends in a stigma which is extremely variable in shape even withim the genus.

The cleistogamous flowers, which lacks petals and never open, produce seeds in abundance. They are generally borne near the ground where they may be found under the leaf mold, and may be easily mistaken for pods, rather than flowers. The conspicuous flowers may actually be sterile, on the other hand.

The fruit is a capsule, splitting when ripe into three boot-shaped valves. On drying they may close along the central line and in so doing eject the smooth seeds one by one with considerable force.

KEY TO GENUS VIOLA

BASED UPON CLEISTOGAMOUS FLOWERS AND FRUITS

1. Plants stemless, leaves and flowers from ground level....2
   2. Leaves deeply 3-divided, the divisions cleft.....
      .....1. V. pedata
   2. Leaves not all divided or cleft, although sometimes
      toothed.....3
      3. Leaves lanceolate to linear-lanceolate, not
         cordate.....2. V. lanceolata
      3. Leaves not lanceolate, leaves cordate.....4
         4. Plants with creeping rootstocks up to 1 foot
            long.....3. V. blanda
         4. Plants without rootstocks or rootstocks very
            short.....5
            5. Leaves triangular, cordate to nearly del-
               toid, the sides straight, capsule on a
               peduncle 6-8 inches long.....
               .....4. V. cucullata
            5. Leaves reniform or orbicular, the sides
               rounded in outline.....6
               6. Leaves glabrous
                  7. Leaves broadly ovate-cordate to
                     orbicular, rounded at tip.....
                     .....5. V. pallens

7. Leaves cordate-ovate to reniform, bluntly pointed...6. *V. nephrophylla*

6. Leaves pubescent

8. Leaf blades reniform, narrowly cordate, slightly pubescent.....7. *V. renifolia*

8. Leaf blades ovate to orbicular, obtuse, willous-pubescent.8. *V. sororia*

1. Plants with leafy stems

9. Leaves cordate.....10

10. Largest leaves up to 3.5 cm. in width at broadest part, averaging much smaller.....9. *V. conspersa*

10. Largest leaves up to 7 cm., averaging about 5 cm. in width.....11

11. Stipules membraneous, dry.....10. *V. camadensis*

11. Stipules green leaf-like.....12

12. Base of stem glabrous, stipules scale-like.....11. *V. eriocarpa*

12. Base of stem pubescent, stipules leaf-like.....12. *V. pubescens*

9. Leaves ovate to lanceolate, not cordate.....13

13. Stipules not toothed.....13. *V. tricolor*

13. Stipules coarsely pectinate-toothed.....14. *V. arvensis*

AN ANNOTATED LIST OF VIOLA OF DOUGLAS LAKE REGION

1. V. pedata L. (Bird-Foot Violet)

   Although this specimen has not been collected in the Douglas Lake Region, it is apparently not rare near Grayling in Crawford County and will undoubtedly turn up eventually in the jack pine plains of southern Cheboygan County in sandy barrens. In the herbarium of the Biological Station is a specimen bearing the following data: "Jack Pine plains near Grayling, Michigan, J. H. Ehlers, June 9, 1926, No. 3316."

2. V. lanceolata L. (Lance-Leaved Violet)

   Open bogs, moist meadows and shores. Specimen collected from shore of Lake Sixteen, Presque Isle County, Michigan.

3. V. blanda Willd. (White Sweet Violet)

   Moist rich woods. Specimens collected from wooded areas of Reese's, Bryants, and Mud Lake Bogs in Cheboygan County and Cecil Bay Bog in Emmet County.

4. V. cucullata Ait.

   Wet places, common. Specimens collected from the Gorge and Lake Huron shore between Cheboygan and Macknaw City, in Cheboygan County.

5. V. pallens (Banks) Brainerd (Sweet White Violet)

   Moist rich woods. Specimens collected from Reese's, Bryants', and Mud Lake Bogs in Cheboygan County, and Cecil Bay Bog in Emmet County.

6. V. renifolia Gray.

Arbor vitae swamps and cool winds. Specimens collected in Reese's Bog, Cheboygan County.

7. V. nephrophylla Greene.

Cold mossy bogs, and borders of streams and lakes. Although no specimens were collected during the summer of 1941, a specimen in the Biological Station Herbarium bears the data: "Edge of Bog, Cecil Bay, George E. Nichols, July, 1927."

8. V. sororia Willd.

No specimens collected during summer of 1941, but a specimen collected by Maude Robertson, August 5, 1912, from the moist rich woods in Cedar Bog near Burt Lake, is in the Biological Station Herbarium.

9. V. conspersa Reishemb.

Shaded, sandy, or gravelly areas. Specimens from roadside near Reese's Bog and the Hardwoods near Mud Lake, Cheboygan County, and the woods near Cecil Bay, Emmet County.

10. V. canadensis L. (Canada Violet)

Usually found in dense, old hardwood forest. Specimens were collected in hardwoods near Mud Lake, Cheboygan County, and near Pictured Rocks, Alger County. In spite of the unusually early season of 1941, flowering specimens were found as late as July 25.

11. V. eriocarpa Schwein

Moist rich beech-maple woods. Specimens collected in hardwoods near Mud Lake and hardwoods near Reese's Bog in Cheboygan County.

12. V. pubescens Ait. (downy Yellow Violet)

In hardwood forest. Specimens collected from hardwoods southwest of Biological Station, Cheboygan County.

13. V. tricolor L. (Pansy, Hearts-Ease)

Roadsides, near dwellings. No specimens were collected during the summer of 1941, but a specimen with the following data: "Roadside near dwellings Munro Lake, July 28, 1925, J. H. Ehlers, No. 3276" is in the Biological Station Herbarium.

14. V. arvensis Murr. (Wild Pansy)

Roadsides. No specimens were collected during the summer of 1941, but a specimen with the following data: "Roadside north of Biological Station, July 10, 1912, Maude Robertson," is in the Biological Station Herbarium.