UNUSUAL FORM OF THE ANNUAL COLLINSIA VERN A NUTT. (BLUE-EYED MARY) OBSERVED IN WILL COUNTY, ILLINOIS

Michael Ostrowski1,* and Mark Kluge2

Abstract: Many typically blue or pink flowered plant species have been observed to have rare white forms. A white form of Collinsia verna Nutt., which typically has a bi-colored blue and white flower, was recently observed in Will County, Illinois. This paper documents this unusual form, discusses its rarity, and examines previous historical descriptions of the species.


INTRODUCTION

Collinsia verna Nutt. is a distinctive annual species in the Plantaginaceae, easily recognized by its whorled inflorescence and bicolored corolla. Specifically, the upper lip is cleft into two large rounded lobes that are white, while the lower lip is cleft into three lobes (Figure 1). The two rounded outer lobes of the lower lip are light blue to blue-violet, while the middle lobe is folded into a keel and hidden from view (Illinois Wildflowers 2021).

RESULTS

Observation of Unusual White-Flowered Form of Collinsia verna

On April 22, 2021 in Homer Glen (Will County, Illinois) five individuals of Collinsia verna were observed to have a corolla with the lower lobes having the same white coloration as the upper lobes (Figure 2). These five specimens were growing within a population of several hundred of the typical blue lower lip form. The two rounded outer lobes of the lower lip are light blue to blue-violet, while the middle lobe is folded into a keel and hidden from view (Illinois Wildflowers 2021).

White forms of customarily blue or pink flowered species have long been discussed in the literature (Moore 1941; Waser 1981). More recently, Wilhelm and Rericha (2017) have detailed several white-flowered forms of native species such as Liatris aspera f. benkii, Monarda fistulosa f. albescens, and Phlox divaricata f. albiflora, in the Chicago region. However, the authors could find no recent reference in the recent literature that acknowledged the existence of a white-flowered form of Collinsia verna. The historical literature is discussed below.

Historical Descriptions

Collinsia verna was first described by Nuttall as the type for the genus (Nuttall 1817). Nuttall first observed the species in 1810 but then lost the specimens. During

1Lake Forest College, 555 N. Sheridan Rd., Lake Forest, IL 60045
2Northeast Chapter of the Illinois Native Plant Society
*ostrowskimr@mx.lakeforest.edu
an 1816 trip he again found the species near Gallipolis, Ohio and collected its seed. This facilitated propagating the plant in order to provide a detailed description of the species.

Rafinesque (1824) proposed to rename the type as *Collinsia bicolor*, described several new forms, and also proposed two new species: *Collinsia alba* and *Collinsia purpurea*. None of these proposals of taxonomy gained any traction within the botanical community as the standard references maintained Nuttall’s name (e.g., Gray 1856; Robinson and Fernald 1908). For the purposes of this paper, only Rafinesque’s *Collinsia alba* is of interest. Rafinesque described the plant he found between Letart Falls and the mouth of the Kanawha River - today in Mason County, West Virginia. The pertinent features of this plant were large flowers, totally white, and small leaves.

The difficulty in assessing Rafinesque’s descriptions is that few of his specimens survive. His personal herbarium of a reported 50,000 specimens was partly destroyed by rats. Nearly all of the remaining specimens were later discarded by Elias Durand who eventually purchased the collection (Merrill 1949). Pennell (1944) recounted that, of sixty new species described by Rafinesque in the Scrophulariaceae (in which *Collinsia* was formerly classified), only eight specimens survived. No specimen of Rafinesque’s *Collinsia alba* is extant, so its precise relationship to the plants observed in Will County must include an element of uncertainty. Pennell (1935) stated that it “was evidently a depauperate, wholly white-flowered form of *C. verna* Nutt.” The plants observed in Will County were not at all depauperate, and other than the white corollas, had the habit and proportions of the typical form.

Newsom’s (1929) comprehensive treatment of the genus *Collinsia* relegated all of Rafinesque’s designations to synonymy. Newsom further stated, “Variations in corolla color I am entirely disregarding, because if such were considered, innumerable varieties would have to be made.” Pennell (1935) echoed the treatment of Rafinesque’s *Collinsia alba* as a synonym. This philosophy has held through all modern treatments of *Collinsia verna* (e.g., POWO 2021).

**Discussion**

The lack of attention in the literature concerning all-white forms of *Collinsia verna* can be partly attributed to the form’s apparent rarity. It may be postulated that the white form results from a combination of recessive alleles. *Collinsia verna* reproduces by a combination of outcrossing and selfing (Kalisz 1989). It is known that insect pollinators discriminate against white phenotypes when white flowers are rare in populations (Waser and Price 1983; Clegg and Durbin 2000). There is research that indicates a lack of pollination drives delayed selfing in *Collinsia verna* (Kalisz et al. 1999). It would seem that selfing would mitigate pollinator discrimination against the white form, but confirming this will require long term observations. It is not clear what other reproductive factors may contribute to the observed rarity of this form within a large population of the typical species.

Future investigation will include determining if examples of the white form will persist at this site in the following growing season. It proved impractical to obtain a collecting permit before the plants senesced in 2021. The authors will pursue the future collection of a specimen for deposit in the Morton Arboretum herbarium (MOR), should the white form reappear in 2022.
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