

Phacelia amabilis is but one of the rare or seldom-collected species which has been secured as a result of their indefatigable efforts.

The writer would ordinarily have preferred to delay publication of this species until more material is available, but in view of the curtailment of field work in the foreseeable future, it seemed advisable to describe it at this time.

Department of Botany,
University of California, Berkeley,
November, 1942.

GILIA MULTIFLORA NUTT. AND ITS NEAREST RELATIVES

THOMAS H. KEARNEY AND ROBERT H. PEEBLES

Gilia multiflora Nutt., a widely distributed species of New Mexico and Arizona, is extremely variable, but is distinguished from its nearest relatives by having the corolla tube nearly always two to three times the length of the lobes, and rarely less than one and a half times the length of the calyx. Very similar to *G. multiflora* in habit, foliage, and pubescence is *G. polyantha* Rydb. which differs, however, in having a shorter corolla tube, this approximately equal in length to the lobes and the calyx.

Typical *G. polyantha* is known apparently only from southwestern Colorado. *Gilia brachysiphon* Woot. and Standl., of southwestern New Mexico, would seem to be specifically distinct from *G. polyantha* were it not for the occurrence in north-central Arizona of a form that is intermediate in several characters. For this reason, it seems best to treat *G. brachysiphon* and the hitherto undescribed Arizona plant as varieties of *G. polyantha*. So far as present information goes, the three forms of this species are rather widely separated geographically.

Another more distantly related member of this small group of perennial plants with filaments normally conspicuously exserted and declined is *G. Harvardi* A. Gray, an apparently rare species of southwestern Texas. The corolla is more pronouncedly zygomorphic, especially in respect to the closely grouped and parallel-declined stamens, than in *G. multiflora* and *G. polyantha*, and for this reason Brand (in Engler, Pflanzenr. 4²⁵⁰: 172. 1907) restored this species to the genus *Loeselia*, where it was placed originally by Asa Gray. *Gilia multiflora* and *G. polyantha*, however, also show a tendency to zygomorphy and the writers concur in Gray's final conclusion that *G. Harvardi* and *G. multiflora* are congeners.

Gilia Macombii Torr., although evidently related to *G. multiflora*, is not considered here because the stamens are not exserted from the corolla tube, or project only about the length of the anthers.

KEY TO THE SPECIES AND VARIETIES.

- Inflorescences short, not thyrsoïd, the zygomorphic flowers in loose, few-flowered terminal clusters; herbage eglandular, villous, even in the inflorescence, with long soft white hairs; stems numerous from a branched caudex, short; corolla tube 6 to 9 mm. long, about twice as long as the calyx, not or only slightly longer than the lobes. . . 1. *G. Havardi*
- Inflorescences elongate, thyrsoïd-glomerate, the flowers nearly regular; herbage usually more or less glandular in the inflorescence, the long white hairs mostly confined to the lower part of the plant.
- Corolla tube 10 to 15 (rarely only 7) mm. long, 1.6 to 2.7 (rarely only 1.2) times as long as the calyx and 1.5 to 3.2 times as long as the corolla lobes, the lobes prevailing oblong or narrowly elliptic but occasionally slightly obovate; inflorescences normally contracted and short-branched; pubescence various 2. *G. multiflora*
- Corolla tube 4.5 to 6.5 mm. long, shorter than to 1.2 (exceptionally 1.7) times as long as the calyx and shorter than to 1.5 times as long as the corolla lobes.
- Lobes of the whitish, sometimes purple-dotted, corolla 3 mm. wide, oval or broadly elliptic; inflorescences relatively open and long-branched, copiously puberulent with glandular hairs, these intermixed with short white hairs. 3. *G. polyantha* (typical)
- Lobes of the pale violet corolla 1.5 to 2.7 (exceptionally 3.5) mm. wide.
- Inflorescences relatively contracted and short-branched, the glomerules dense; upper part of the plant canescent with short white hairs, the glandular hairs relatively few and mostly hidden by the others; corolla lobes prevailing elliptic or oblong 3a. *G. polyantha* var. *brachysiphon*
- Inflorescences relatively expanded and long-branched, the glomerules relatively loose; upper part of the plant commonly with abundant glandular hairs, these intermixed with but usually not concealed by the short white hairs; corolla lobes prevailing oblanceolate or obovate 3b. *G. polyantha* var. *Whitingi*

1. *GILIA HAVARDI* A. Gray, Syn. Fl. N. Amer. ed. 2, 2¹: 411. 1886. *Loeselia Havardi* A. Gray, Proc. Amer. Acad. Arts and Sci. 19: 87. 1883.

Presidio and Brewster counties, southwestern Texas, near Presidio (*Havard* in 1881, the type collection), vicinity of the Chinati Mountains (*Nealley* in 1889), vicinity of the Chisos Mountains (*Sperry* 623). The stems are less than 20 cm. long. The species is very distinct in appearance from other members of this group. The herbage is uniformly villous with long, soft, white, segmented hairs, these extending even to the calyx, whereas in

G. multiflora and *G. polyantha* such hairs are confined largely to the lower leaves. The leaves are mostly pinnatifid with 3 to 5 lobes. The ovules are "several in each cell" (Gray, *ibid.*).

2. *GILIA MULTIFLORA* Nutt., Jour. Acad. Nat. Sci. Phila. ser. 2, 1: 154. 1848.

This species seems to be known only from the mountains of New Mexico and Arizona, where it is common and widely distributed, but it probably occurs also in northern Mexico. The type, collected by Gambel on "sandy hills along the border of the Rio del Norte, New Mexico," has not been seen by the writers. There is no type material in the herbarium of the Philadelphia Academy of Sciences or in the Gray Herbarium. This is a highly variable species, but departures from the norm in floral characters do not appear, as a rule, to be correlated among themselves or with peculiar vegetative characters. The plants are potentially long-lived and some of the specimens from southern Arizona are distinctly woody toward base. The pubescence consists of two main types of hairs: (1) soft, white, flattened, segmented hairs, these often elongate near the base of the plant, especially on the leaves, but normally becoming very short in the inflorescence, where they are usually intermixed with (2) clavate or stipitate glandular hairs. Occasional specimens show granular puberulence, apparently of a resinous nature. The leaves vary from entire to pinnatifid with 3 to 7 narrow lobes.

The inflorescences are normally contracted and short-branched, but occasional specimens resemble *G. polyantha* Rydb. in their relatively open and long-branched inflorescences. The insertion of the filaments is normally very nearly at the same level, usually just below the rim of the throat, but sometimes deep in the tube. The anthers are at nearly the same level, or some of them are 1 to 2 mm. below the others. Counts in eight ovaries, each from a different individual plant, showed a range from 5 to 15 ovules, indicating a variation of from 2 to 5 per cell.

Two outstanding variants, both found in Arizona, may prove worthy of recognition as varieties when more material is available. The first, collected near Flagstaff (*Rusby* 729), and on "Ivy Mesa, Mogollon Mountains"¹ (*MacDougal* 644), is characterized by numerous, slender, almost flexuous stems; inflorescences with subfarinose puberulence, obscurely if at all glandular or granular; leaves nearly all entire except near the base of the plant, very sparsely villous; corolla tube only 7 to 8.5 mm. long and only 1.6 to 2.0 times as long as the lobes, whereas in *G. multiflora* the tube is usually at least 10 mm. long and more than twice as long as the lobes.

The second remarkable variant was collected in Oak Creek Canyon, Coconino County (*Whiting* 1053/5300). It is distin-

¹ The "Mogollon Mountains" of Arizona are the precipitous southern edge of the Mogollon Mesa, also often referred to as the "Tonto Rim" or "Mogollon Rim."

guished from all forms of *G. polyantha* by having a corolla with tube 2.5 times as long as the lobes, but differs markedly from typical *G. multiflora* in the following characters: calyx 8.5 mm. long and nearly equalling the tube of the corolla, whereas in *G. multiflora* the calyx is normally only 5 to 7 mm. long and seldom more than three-fifths as long as the tube; corolla lobes broadly obovate, three-fourths as wide as long, whereas in *G. multiflora* they are commonly oblong or only slightly obovate and not more than half as wide as long; corolla throat exceptionally ample, 3.5 mm. wide at the orifice in the pressed specimen, as compared with a usual width of 2 to 3 mm. in *G. multiflora*. A collection in the Baboquivari Mountains, Arizona, (*Gilman B124*) has an equally wide corolla throat but is otherwise normal in its flower characters, and the plant is decidedly woody toward base, which is not the case in Whiting's plant.

3. *GILIA POLYANTHA* Rydb., Bull. Torr. Bot. Club 31: 634. 1904. *Gilia exserta* A. Nelson, Bot. Gaz. 40: 65. 1905. *Gilia multiflora* var. *polyantha* Brand, in Engler, Pflanzenr. 4²⁵⁰: 113. 1907.

The type of *G. polyantha*, which is also the type of *G. exserta*, was collected at Pagosa Springs, Archuleta County, southern Colorado, altitude 7,000 feet (*C. F. Baker 538*) and the typical form of the species seems to be known only from this locality, where it has been collected also by Bethel, Willey, and Clokey (*4251*). It is taller and has more elongate, longer-branched inflorescences than most specimens of *G. multiflora* and is readily distinguished from that species by the flower characters stated in the key. On the other hand, it resembles *G. multiflora* in habit, foliage, and pubescence. The leaves sometimes have as many as 9 lobes. Counts of the number of ovules per ovary gave 13 for the type specimen and 10 for the other. A. Nelson (*ibid.*) reported the ovules as only "about 2 in each cell," in the type collection. The plant was stated by Nelson to be biennial, but it is almost certainly perennial, as Rydberg described it.

3a. *GILIA POLYANTHA* Rydb. var. *brachysiphon* (Woot. and Standl.) comb. nov. *Gilia brachysiphon* Woot. and Standl., Contrib. U. S. Nat. Herb. 16: 160. 1913.

The type of *Gilia brachysiphon* was collected in the Organ Mountains, Dona Ana County, New Mexico (*Wooton* in 1894) and this variety is known also from several other localities, all in southwestern New Mexico (Sierra, Grant, and Catron counties). It differs from typical *G. polyantha*, and from most specimens of the following variety, in the rarity or entire absence of glandular hairs. Counts showed 18 ovules per ovary in the type and 14 in another specimen.

3b. *GILIA POLYANTHA* Rydb. var. *Whitingi* var. nov.

A forma typica *G. polyanthae* corolla violacea lobis plerumque obovatis differt; a *G. polyantha* var. *brachysiphon* inflorescentia laxiore et plerumque copiose glandulifera differt; a *G. multiflora*

corollae tubo quam calyce et corollae lobis vix longiore distinguitur.

The type was collected at the Grand Canyon, Coconino County, Arizona (*Whiting 1072/5200*, U. S. Nat. Herb. 1814983). Other collections, all in Coconino County, at elevations of 6,800 to 7,200 feet are: Grand Canyon (*Eggleston 15669, 15682*), south rim of the Grand Canyon (*Collom 1073*), Grand Canyon Road (*Whiting 1047/4311*), near the Grand Canyon (*Lemmon* in 1884),² Williams (*Rusby* in 1883), base of the San Francisco Peaks (*Wooton 489*), Walnut Canyon National Monument (*Beaubien 1054/5320*). There is also, in the United States National Herbarium, an imperfect specimen, labeled in G. R. Vasey's handwriting, "Nevada, Lt. Wheeler, 1872," that apparently belongs here. This specimen may have been the basis for the inclusion of Nevada in the range of *G. multiflora*, in Tidestrom's Flora of Utah and Nevada (Contrib. U. S. Nat. Herb. 25: 435. 1925). If it is correctly labeled as to locality, var. *Whitingi* has a wider range than the other forms of *G. polyantha*.

There is a much stronger tendency than in *G. multiflora*, and in the other forms of *G. polyantha*, to have the corolla lobes widest near the apex, but this is not invariably the case. The stamens, as is usually also the case in *G. multiflora*, are inserted very nearly at the same level. Counts made on six individual plants, including the type, showed that the number of ovules per ovary varies from 6 to 18.

Bureau of Plant Industry,
United States Department of Agriculture,
Washington, D. C.
United States Field Station
Sacaton, Arizona.
June 27, 1942

REVIEW

Wild Violets of North America. By VIOLA BRAINERD BAIRD. Pp. xv + 225, with 17 illustrations in the text and 80 plates in full color. University of California Press, Berkeley. 1942. \$10.00.

This attractive volume, written in non-technical language, will please both professional botanists and amateurs. The preparation of a complete account of North American violets is a task for which the author is especially well equipped. Familiar with the group since childhood, Mrs. Baird assisted her father, Ezra Brainerd, in his well-known studies on the genus and during later years she has continuously added to her knowledge by field and garden studies of almost every species.

The brief preamble contains an informative résumé of the distribution and probable sources of the North American species of *Viola*, a discussion of the variation in such characters as leaf

² Cited by Brand (Pflanzenr.) under *G. multiflora* var. *polyantha*. The collection at Cosnino, Ariz. (*Jones 4043*) also cited by Brand under var. *polyantha*, is *G. multiflora*.



Kearney, Thomas H. and Peebles, Robert H . 1943. "GILIA MULTIFLORA NUTT. AND ITS NEAREST RELATIVES." *Madroño; a West American journal of botany* 7, 59–63.

View This Item Online: <https://www.biodiversitylibrary.org/item/185856>

Permalink: <https://www.biodiversitylibrary.org/partpdf/169828>

Holding Institution

Smithsonian Libraries and Archives

Sponsored by

Biodiversity Heritage Library

Copyright & Reuse

Copyright Status: In Copyright. Digitized with the permission of the rights holder

Rights Holder: California Botanical Society

License: <http://creativecommons.org/licenses/by-nc/3.0/>

Rights: <https://www.biodiversitylibrary.org/permissions/>

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.