

Miscellaneous Eastern Polemoniaceae¹

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In bringing to a close my series of studies on the members of the Polemonium Family occurring east of the Mississippi River, a key to the genera concerned, simplified to cover only eastern representatives, is first given:

POLEMONIACEAE: KEY TO NATIVE AND ADVENTIVE EASTERN GENERA

Sepals all alike, entire.

Calyx-tube remaining unbroken to maturity of capsule.

Leaves pinnately compound; calyx-tube herbaceous, markedly accrescent.

Duration perennial; flowers borne in cymose clusters; bracts small*Polemonium*.

Duration annual; flowers borne singly in the axils of large bracts*Polemoniella*.

Leaves entire to pinnatifid; calyx-tube more or less herbaceous, not markedly accrescent.
Collomia.

Calyx-tube becoming ruptured by the maturing capsule.

Leaves entire or essentially so; corolla salverform*Phlox*.

Leaves lobed or dissected.

Plants coarse biennials with numerous leaves and thyrsoid inflorescence; corolla red, open salverform; seeds obliquely polyhedral, buff, translucent*Ipomopsis*.

Plants delicate annuals with few leaves and corymbose to capitate inflorescence; corolla violet or lavender, open salverform to funnelform; seeds ellipsoidal, light to dark brown, opaque*Gilia*.

Sepals unequal, spinulose-lobed; calyx-tube unbroken to maturity of capsule*Navarretia*.

Identity of *Polemonium ciliatum* Willd. ex Roem. & Schult.

In the course of collecting material for the present article, a question arose as to the identity of "*Polemonium ciliatum*." This had been sent to Europe by Muhlenberg from Pennsylvania, presumably from Lancaster County, where he lived, and was described² as having acute leaf-segments and calyx-lobes. In compiling the Kew Index, Jackson³ recognized that it represented a *Phacelia*, but referred it to *P. fimbriata* Michx., overlooking the facts that this has obtuse leaf-segments and calyx-lobes, and grows only farther southwest. Brand⁴ at first accepted this interpretation, but later⁵ allocated this supposed *Polemonium* to *Phacelia purshii* Buckley. That this is the most satisfactory solution of the problem is affirmed here, in order that future workers may avoid overlooking Brand's final conclusion.

¹ Contribution from the Botanical Laboratory and Morris Arboretum of the University of Pennsylvania.

² Systema veg. 4: 792, 1819.

³ Index Kewensis 3: 584, 1894.

⁴ In Engler's Pflanzenreich IV. 250: 47, 1907.

⁵ In Engler's Pflanzenreich IV. 251: 62, 1913.



FIG. 1. *Collomia linearis*.
Oregon.



FIG. 2. *Ipomopsis rubra*.
In cultivation.

COLLOMIA NUTTALL

In 1811 Thomas Nuttall collected in the northwestern prairie region, chiefly along the lower Cheyenne valley in what is now South Dakota, a small annual which obviously belonged to the *Polemoniaceae*, but was peculiar in that its seeds became mucilaginous when moistened. He decided that this represented a previously unrecognized genus, including also one or two South American plants which had been assigned to *Phlox*, and proposed¹ for this the name *Collomia*, from the Greek word for glutinous material. Gray² at first accepted the genus as valid, transferring into it several plants previously classed as *Gilia*. Subsequently, however, he recognized³ that what he had regarded as a differentiating character, unequal insertion of stamens, was shown by certain unmistakable *Gilia*s; despairing of finding any other distinctive feature, he proceeded to reduce *Collomia* to the status of a Section under *Gilia*. A valid and fundamental basis for generic distinction was found soon afterward, however, by Greene,⁴—in typical *Gilia*s the calyx-tube is ruptured by the maturing capsule, while in the *Collomia*s the calyx is sufficiently accrescent to remain intact to maturity. This was ignored by Gray and by the editors of the 6th and 7th editions of his *Manual of Botany*, where the sectional status of *Collomia* is maintained; but most recent workers have admitted the generic independence of *Collomia*, which is emphatically favored here. The genus comprises approximately 5 perennial and 5 annual species of western North America, with 2 or 3 annuals in southern South America. Only Nuttall's original species ranges sufficiently far to the east to be covered in the present article.

Collomia linearis Nuttall.

History.—The original species on which the genus *Collomia* was based was named by Nuttall¹ *C. linearis* in reference to its dominantly linear leaves. It was mistakenly transferred to the genus *Hoitzia* (Jussieu 1789) by Sprengel⁵ in 1825, while many years later, under the circumstances above discussed, Gray³ made it *Gilia linearis*. It was renamed *Collomia parviflora* by Hooker⁶ and several variants have received special names: a broad-leaved phase *C. lanceolata* Greene;⁷ a stunted one *C. linearis* var. *humilis* Brand,⁸ one with the bracts somewhat mottled *C. linearis* var. *picta* Lunell,⁹ and still another with profuse branching *C. linearis* var. *congesta* Lunell.¹⁰

¹ Genera N. Am. Plants 1: 126, 1818.

² Proc. Amer. Acad. Arts Sci. 8: 258, 1870.

³ Proc. Amer. Acad. Arts Sci. 17: 223, 1882.

⁴ Pittonia 1: 122, 126, 1887.

⁵ Systema veg. 1: 626, 1825.

⁶ Curtis's Botanical Magazine 56: pl. 2893, 1829.

⁷ Plantae Bakerianae; ex Brand in Engler's Pflanzenreich IV. 250: 49, 1907.

⁸ In Engler's Pflanzenreich IV. 250: 49, 1907.

⁹ Bull. Leeds Herb. 2: 7, 1908.

¹⁰ Am. Midl. Nat. 4: 512, 1916.

Geography.—Botanical exploration of western North America subsequent to Nuttall's time showed *Collomia linearis* to be widespread there, and by 1870 Gray¹ was able to state the range as "Both sides of the Rocky Mountains, north to Mackenzie River; also on the shore of New Brunswick, Fowler, perhaps a waif." With respect to the final item, it should be noted that subsequent collecting has shown that the species is present at a number of stations in both New Brunswick and Quebec, in a region where many northwestern plants occur as relics of a former cross-continental distribution, disrupted by the last ice sheet. These eastern colonies are accordingly here regarded as native, although the plant is unquestionably of recent introduction at several intervening points. On the accompanying map only records east of longitude 100° are shown.



FIG. 1. Distribution of *Collomia linearis*.

[ILLINOIS: Becoming increasingly abundant as a weed, especially along railroad lines, in Cook^x, Du Page^x, Jo Daviess^x, and Kane^x counties.]

IOWA: Recorded from Chickasaw^x, Decatur, Dickinson, Emmet^x and Lyon counties.

[MAINE: Adventive in York^x County.]

MINNESOTA: Widespread northward, specimens having been seen from 10 counties: Aitkin, Becker, Chippewa, Goodhue, Jackson, Mille Lacs, Otter Tail, Pipestone, St. Louis and Stearns.

[MISSOURI: Entering along a railroad in Marion^x County.]

NEBRASKA: Common westward, and ranging east of 100° in Antelope and Cedar counties.

[NEW JERSEY: Collected once as a weed in Camden^x County.]

[NEW YORK: Adventive along a railroad in Cattaraugus^x County.]

NORTH DAKOTA: The county list reaches a maximum of 15 in this state, although only part of them are toward the eastern end: Barnes, Benson, Cass, Grand Forks, La Moure, Pembina, Richland, and Stutsman.

[PENNSYLVANIA: Found as a weed at opposite corners, in Crawford^w and Philadelphia^w counties.]

SOUTH DAKOTA: Widespread in the western part, and collected in one eastern county, Brookings.

[VERMONT: Adventive in waste places in Bennington^w and Chittenden^w counties.]

WISCONSIN: Recorded from Douglas, Jefferson^w, Pierce, and Price counties, and apparently native in most of them.

CANADA: Extending from the northwest across Manitoba to westernmost Ontario, in Thunder Bay County. In the St. Lawrence valley recorded from 3 or 4 stations each in Restigouche-Madawaska County, New Brunswick, and Bonaventure County, Quebec.

Ecology.—*Collomia linearis* is a pioneer plant, appearing on gravel banks, sand-hills, and burned-over land at an early stage in their revegetation. It persists into intermediate successional stages, but tends to die out as climax conditions develop. Some of man's activities favor its spread, and it appears to be expanding its range over the northeastern states along fence-rows, railroad embankments, and waste-places generally, although there is no indication of its becoming a serious weed. Its tiny pink ¹ flowers are produced for 2 or 3 months in summer, but seem too inconspicuous to attract insects, and no data are available as to its pollination.

Variation.—In response to differences in availability of moisture and of nutrients, this species varies from a slender, narrow-leaved simple-stemmed plant a few centimeters tall to a robust lanceolate-leaved plant with a much-branched inflorescence. The following forms may be distinguished:

FORMS OF COLLOMIA LINEARIS.

Stunted. *C. l.* var. *humilis* Brand.
Luxuriant. *C. l.* var. *congesta* Lunell.
Broad-leaved. *C. lanceolata* Greene.
Mottled-bracted. *C. l.* var. *picta* Lunell.

Cultivation.—In the text accompanying the figure of this plant in the Botanical Magazine, Hooker ² noted that it had been "introduced by Mr. Douglas to the garden of the Horticultural Society," and that it had proved to be a "hardy annual, flowering nearly the whole summer." Its flowers are too inconspicuous, however, for it to have found general favor, and its seeds are rarely offered for sale. Several other members of the genus, with more showy flowers, are often cultivated.

¹ In Maerz & Paul's Dictionary of Color 41-E-2 to 41-J-5 (or 49-E-6.)

² Curtis's Botanical Magazine 56: pl. 2893, 1829.

IPOMOPSIS MICHAUX.

A showy red-flowered member of the *Polemoniaceae* native to the southeastern United States, classed by Linné¹ as a member of his genus *Polemonium* and by Lamarck² as belonging to Jussieu's *Cantua*, was made by Michaux³ the type of an independent genus, *Ipomopsis*. Two years later Persoon⁴ referred this plant, with a question mark, to the Ruiz and Pavon genus *Gilia*. In 1818 Nuttall,⁵ "for the sake of euphony," altered Michaux's name to *Ipomeria*, and still later Rafinesque⁶ put forward a wholly new one, *Batanthes*. Bentham,⁷ Gray,⁸ and most recent authors have concurred in Persoon's generic assignment, although Greene⁹ urged the acceptance of Rafinesque's genus name for some of the species. On the basis of the characters given in the key, the plant is here regarded as probably worthy of generic segregation, and a return to the earliest name for it, that of Michaux, is favored. The genus comprises about 10 western species, and a single eastern one.

Ipomopsis rubra (Linné) Wherry, comb. nov.

History.—An extraordinary number of name-combinations have been applied to the species under discussion, the more noteworthy being: *Polemonium rubrum* Linné,¹ *Cantua pinnatifida* Lam.,² *C. coronopifolia* Willd.,¹⁰ *Ipomopsis elegans* Michx.,¹¹ *Cantua thyrsoides* Juss.,¹² *Gilia coronopifolia* Pers.,⁴ *Cantua elegans* Poir.,¹³ *Ipomeria coronopifolia* Nutt.,⁵ *Navarretia rubra* Kuntze¹⁴ and *Gilia rubra* Heller.¹⁵ Since no one has heretofore associated the earliest species name with that of the earliest genus, a new combination is here called for. A slender variant which develops in Florida sand barrens has been named successively *Cantua floridana* Nutt.,¹⁶ *Gilia floridana* Don,¹⁷ and *G. rubra* var. *capillacea* Brand.¹⁸ Several color forms have also been assigned horticultural names, such as "picta" for one with the corolla yellow within, "lutea" yellow throughout, and "superba" purplish red.

¹ Species Plantarum: 163, 1753.

² Tabl. Encycl., Ill. gen. 1: 473, 1791.

³ Flora Boreali-Americana 1: 141, 1803.

⁴ Synopsis plantarum 1: 187, 1805.

⁵ Genera N. Am. Plants 1: 124, 1818.

⁶ Atlantic Journ.: 145, 1832.

⁷ In De Candolle's Prodrum 9: 313, 1845.

⁸ Proc. Amer. Acad. Arts Sci. 8: 275, 1870.

⁹ Leaflets Botan. Obs. & Crit. 1: 224, 1906.

¹⁰ Species Plantarum 1 pt. 2: 879, 1797.

¹¹ Flora Boreali-Americana 1: 142, 1803.

¹² Ann. Mus. Paris 3: 119, 1804.

¹³ Encycl. meth., Bot., Suppl. 2: 80, 1811.

¹⁴ Rev. Gen. Plant. (1): 433, 1891.

¹⁵ Contr. Herb. Franklin & Marshall 1: 81, 1895.

¹⁶ J. Acad. Nat. Sci. Phila. 7: 110, 1834.

¹⁷ Gen. Hist. Dichl. Plants 4: 245, 1838.

¹⁸ In Engler's Pflanzenreich IV. 250: 116, 1907.

GEOGRAPHY.—As a native plant, *Ipomopsis rubra* ranges from central Texas to Florida, and sporadically northward to southern Oklahoma and southeastern North Carolina. It has also escaped from cultivation northward:

ALABAMA: Reported in but four counties, Autauga, Baldwin, Bibb, and Mobile.

ARKANSAS: Seen by Nuttall in the southeastern prairies.

[DELAWARE: Escaped in Sussex^x County.]

FLORIDA: Widespread yet not frequent, specimens having been seen from but 8 counties: Brevard, Duval, Escambia, Lake, Levy, St. Johns, Sumter, and Volusia.

GEORGIA: Known in Chatham, Clarke, Cobb, and Gwinnett counties.

[ILLINOIS: Adventive in Winnebago^x County.]

[MARYLAND: An escape in Wicomico^x and perhaps other counties.]

[MASSACHUSETTS: Recorded from Franklin^x County.]

[MICHIGAN: Has succeeded in establishing itself in Allegan^x and Oakland^x.]



FIG. 2. Distribution of *Ipomopsis rubra*.

MISSISSIPPI: Known thus far only along the coast in Jackson County.

[MISSOURI: Apparently escaped in Clark^x, Greene^x and Holt^x counties.]

[NEW JERSEY: Established at several points in Atlantic^x and Cumberland^x.]

[NEW YORK: Escaped in Westchester^x County.]

NORTH CAROLINA: Specimens preserved from Craven County probably represent a native colony. The type locality was given as "Carolina."

[OHIO: Recorded as escaping in Erie^x, Lake^x, and Sandusky^x counties.]

OKLAHOMA: Specimens seen from Choctaw, Comanche, Jackson and Murray.

SOUTH CAROLINA: Definitely reported only from Fairfield and Oconee counties.

TENNESSEE: Recorded in McMinn County.

TEXAS: Abundant and widespread, there being at least 25 county records: Anderson, Austin, Bexar, Brazos, Burnet, Cherokee, Collin, Comal, Dallas, Fannin, Galveston, Gillespie, Harris, Kendall, Kerr, Kimble, McLennan, Mitchell, Montgomery, Morris, Parker, Rusk, San Augustine, Tarrant and Travis.

[VIRGINIA: Escaped in Chesterfield^x County.]

Ecology.—*Ipomopsis rubra* is chiefly an occupant of sandy or gravelly land, where mineral-rich subsoil or admixture of shells prevent the development of high acidity. When it invades real sand-barrens it becomes rather delicate in aspect, and as noted under History, has received varietal or even specific segregation. Its biennial duration and the reduced transpiration surface of its pectinately dissected foliage mark it as a moderate xerophyte, although it scarcely invades the drier parts of Texas. Requiring abundant light, it is best developed in early successional stages, and dies out from climax forests. The flowers begin to open in late May toward the southern border of the range, in late June further north, and continue to appear for two or even three months. Their open-salverform corolla with red exterior¹ and more or less orange interior are adapted to attract humming-birds, which visit the colonies in abundance. Large quantities of viable seeds are produced, which germinate freely in the Spring, forming the first season dense rosettes; many of these are killed during the succeeding winter, but those which survive begin in early Spring to send up the season's blooming stalks.

Variation.—This species varies considerably in size in relation to availability of nutrients in the soil, but the differences are not here regarded as sufficiently significant to justify nomenclatorial recognition.

Cultivation.—This showy plant early attracted the attention of Catesby, who sent seeds to the Eltham garden, where it was studied and described by Dillenius² in 1732. It soon found its way into many other gardens, and several of the species names assigned to it were based on cultivated material. In the trade, both in Europe and America, the seeds are usually offered under the name *Gilia coronopifolia*. It is of easy culture, though succeeding best in a rather dry, sandy soil, and tending to succumb to fungus attack in moist locations.

GILIA RUIZ AND PAVON

The genus name *Gilia* was proposed by Ruiz and Pavon³ in 1794, a single South American species, *G. laciniata*, being described by them⁴ five years later. That representatives of this genus occur also in North America appears to have been first recognized by Sprengel,⁵ who in 1825 listed 5 species, four of which had been originally described under other genera. From that time on the size of the

¹ The color of the exterior is close to the pure scarlet, 1-L-12, of Maerz & Paul's Dictionary of Color.

² Hortus Elthamensis 2: 321, pl. 241, f. 312, 1732, as *Quamoclit pennatum*, etc.

³ Flora Peruv. & Chilen. Prodr. 1: 25, pl. 4, 1794.

⁴ Flora Peruv. & Chilen. 2: 17, pl. 123 f. b, 1799.

⁵ Systema veg. 1: 625, 1825.

genus increased rapidly, especially through the merging with it of many other genera, until it now, as often interpreted, comprises over 100 species. Though freely admitting that valid grounds for generic segregation are difficult to find, I feel that the "lumping" process has gone rather too far, and prefer to maintain such groups as *Ipomopsis* and *Navarretia* as distinct.

None of the typical *Gilias* are native to the eastern United States, but at least five have been reported as escapes; these all have corollas of a more or less funnelform shape and violet or lavender color, but differ in the respects listed:

Gilia achilleifolia Benth. with deep violet broad-petalled flowers in few-flowered heads, around New York City.

G. capitata Dougl. ex Hook., with lavender narrow-petalled flowers, in many-flowered heads, around New York and in Highland County, Ohio.

G. inconspicua (Smith) Dougl. ex Hook. a small plant with most of its leaves basal and pale lavender flowers in lax corymbs, in Middlesex County, Mass.

G. multicaulis Benth., a much-branched plant with numerous purplish flowers grouped in a large cyme, in Cumberland County, Maine and Middlesex, Mass.

G. tricolor Benth., a spreading-branched plant with the corymbose-cymose flowers yellow in the center, dark purple-blotched in the throat, and pale lavender on the limb, in Essex County, Mass. The introduced material was recognized by Greenman¹ as representing a variety, which he named *longipedicellata*; its nativity was at the time unknown, but it was subsequently found in California.

NAVARRETIA RUIZ AND PAVON

Like the next-preceding genus, this one was proposed² in 1794 and a species native to Chile and Argentina, *Navarretia involucrata*, was described³ in 1799; a number of species were subsequently recognized in the western United States. In 1836 Endlicher⁴ reduced its status to that of a section under *Gilia*, and has been followed by some authors, although others have maintained its generic distinctness. Kuntze⁵ pointed out that the name has page priority over *Gilia*, and renamed many species usually assigned to the latter.

Two species have been reported as adventive in the east:

Navarretia intertexta (Benth.) Hook., with the calyx villous throughout and the violet corollas nearly tubiform, in Lee and Page counties, Iowa, and Allen County, Ohio.

Navarretia leucocephala Benth., in which the calyx is villous only intercostally and the corollas are whitish and funnelform, in Middlesex County, Massachusetts.

¹ *Rhodora* 6: 154, 1904.

² *Flora Peruv. & Chilen. Prodr.* 1: 20, 1794.

³ *Flora Peruv. & Chilen.* 2: 8, 1799.

⁴ *Genera plantarum*: 657, 1836.

⁵ *Rev. Gen. Plant.* (1): 432, 1891.



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