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THE INDIGENOUS VARIETIES OF PRUNELLA VULGARIS IN NORTH AMERICA.

M. L. FERNALD.

IN recent years specimens of *Prunella vulgaris* L. have been sent to the Gray Herbarium by various New England botanists who have found the plant growing in lawns or roadsides and have urged that it is somewhat different from the common American plant passing as *P. vulgaris*. Upon receipt recently of such a specimen, the writer undertook a somewhat detailed examination of *Prunella vulgaris*. It was quickly obvious that most of the American material, the common plants from Newfoundland to Alaska, south through the Northeastern States, about the Great Lake region, and among the Rocky Mountains into Mexico, differed from the European *P. vulgaris* in the outline and proportions of the cauline leaves.

In the European type the principal cauline leaves (the median ones) are of an ovate or ovate-oblong outline and rounded at base, averaging fully one-half as broad as long. In North America an apparently identical broad-leaved plant occurs, chiefly in lawns and fields of the Eastern States, eastern Canada and Newfoundland, where it generally appears like an introduced weed. This is the broad-leaved plant which has recently been collected in New England lawns and by various collectors seen to be somewhat different from the indigenous *Prunella* of the region.

The clearly indigenous plants, found in open woods, on banks of streams and in mountain-meadows, but freely spreading into the cleared areas, from Newfoundland to Alaska, south to the Carolina mountains, Kansas, and mountains of Mexico and of southern California, have the principal or median cauline leaves narrower than in the common European *Prunella vulgaris*, lanceolate to oblong, and gradually tapering or cuneate at base, averaging only one-third as broad as long; ¹ and although during the past few decades these American plants have been passing without comment as *P. vulgaris*, it is note-

¹ Measurements of 28 specimens of the European plant with the leaves rounded at base show the median cauline leaves to vary from $\frac{2}{5}$ to $\frac{2}{3}$ as broad as long (average $\frac{1}{2}$), while 60 specimens of the indigenous American plants with cuneate-based leaves show the median leaves to range from $\frac{1}{5}$ to $\frac{1}{2}$ (average $\frac{1}{3}$) as broad as long.

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worthy that the keen earlier generations of American and European botanists were perfectly aware of a difference and treated the commoner native plant of America either as a distinct species or an American variety. In 1804 Willdenow, in *Hortus Berolinensis*, described and illustrated from Pennsylvania *Prunella pensylvanica*,¹ said to differ from *P. vulgaris* by slight characters of the flowers but shown in the plate as a plant with remarkably toothed leaves such as it is impossible to match by any American material known to the writer. Whether Willdenow's plate was based upon an American plant seems very doubtful and his herbarium material, according to Bentham,² was a mixture; but under the name *P. pennsylvanica* the commonest lanceolate-leaved American plant was taken up by Jacob Bigelow (1814), Pursh (1814), Amos Eaton (1818) and others and kept apart as a species from the ovate-leaved *P. vulgaris*.

Others of the same and immediately succeeding generations treated this narrow-leaved plant as a variety of the broader-leaved one. Thus we find Nuttall saying (without, however, any definition or other indication of just what he included in his variety): " β pennsylvanica. A mere variety of the preceding [P. vulgaris], which is certainly an introduced plant, never appearing far beyond the precincts of habitations."³ Barton, in the same year, took up P. pennsylvanica as a species, apparently to cover all the Eastern American material, and divided it into two varieties: a orata, with "leaves ovate" [true P. vulgaris] and B lanceolata, with "leaves lanceolate";4 and subsequently supplied a beautiful plate and detailed description⁵ of his P. pennsylvanica, β . lanceolata so that there is no question that he had the common American plant with lanceolate leaves gradually narrowed to the base, and the bracts and calyces green, the former copiously ciliate. Subsequently many authors, Bigelow in the 2d edition of the Florula Bostoniensis (1824), Beck (1833) and others, recognized that P. pennsylvanica, at least of Pursh and subsequent authors, though not exactly of Willdenow, was an American variety of P. vulgaris.

In 1834 the same plant was treated by Bentham in his monograph of the *Labiatae* as *P. vulgaris*, " γ elongata, foliis integris oblongolanceolatis, glabris vel parce villosis....in America boreali vulgaris, in

- ⁴ Barton, Fl. Phil. ii. 37 (1818).
- ⁵ Barton, Fl. N. A. ii. 69, t. 60 (1822).

¹ Willd. Hort. Berol. t. ix (1804).

² Benth. Lab. Gen. et Sp. 417 (1834).

³ Nutt. Gen. ii. 37 (1818).

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Europa et Asia rarior," while the ovate- or oblong-leaved " β vulgaris" was said to be "in Europa et Asia vulgatissima... in America boreali rarior."¹ In Hooker's *Flora Boreali-Americana*, in 1838, true *P. vulgaris* was recognized only from eastern Canada and Newfoundland, while the plants of the Northwest were treated as " β . major, foliis angustioribus. P. Pennsylvanica."²

The preceding citations and quotations are sufficient to show that the earlier students of our flora studied Prunella; but in recent discussions of the North American flora few mentions seem to occur of the fact that we have several well marked variations, one perhaps only introduced, the others indigenous. In the several editions of Gray's Manual, Prunella (or Brunella) vulgaris has been treated as purely indigenous, though in the Synoptical Flora Gray implied that it is introduced as well as native, saying "evidently indigenous in some of the cooler districts."³ By Britton & Brown it is said to be "Naturalized from Europe. Native also of Asia. Possibly native in northern British America"; ⁴ while in Britton's Manual it is said to be merely "Nat. from Europe."⁵ To those who know the flora of the northern States and Canada in the field, however, there is no question of the indigenous character of the narrow-leaved variations of P. vulgaris; and Professor John Macoun, although not indicating the differences between the varieties, was expressing a widely felt conviction when he wrote: "It is probable there are two forms in the east where there may be an introduced one, but the western and Ontario form is certainly indigenous."⁶

In the commonest North American variety of *Prunella vulgaris* (Barton's *P. pennsylvanica* β *lanceolata*) as in the true *P. vulgaris* the bracts are copiously bristly-ciliate with long white hairs; but in the Northwest, from Vancouver Island to northern California and Wyoming, there are found other varieties, with the margins of the bracts quite smooth or at most with sparse and comparatively short ciliation. These varieties appear to have been unrecognized here-tofore; as does a very beautiful plant of the Aleutian Islands with the ciliate bracts and the calyx deep purple, the bracts almost lanate with white tomentum.

¹ Benth. Lab. Gen. et Sp. 417, 418 (1834).

- ² Hook. Fl. Bor.-Am. ii. 114 (1838).
- ³ Gray, Syn. Fl. ii. pt. 1, 382 (1878).
- ⁴ Britton & Brown, Ill. Fl. iii. 88 (1898).
- ⁵ Britton, Man. 788 (1901).
- 6 Macoun, Cat. Can. Pl. i. 389 (1884).

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Another variety, with the ovate-oblong cauline leaves rounded to the base but with the stems, petioles, and often the lower surfaces of the leaves densely villous-hispid, is found in dry woods from Kentucky and North Carolina to Florida and Louisiana. This is Rafinesque's *Brunella cinerea*, recently described by Pollard & Ball as a new variety, *P. vulgaris scaberrima*,¹ but it closely matches material received at the Gray Herbarium from Bentham of his *P. vulgaris*, a hispida² from India and southern Europe. It would seem, therefore, that var. hispida, like the plant which Bentham called var. elongata (*P. penn-sylvanica*, var. lanceolata Barton), is indigenous in America as well as in Eurasia, though of less boreal range on both continents.

The preceding discussion may be briefly summarized as follows:

- A. Principal or median cauline leaves ovate or ovate-oblong, rounded at base, $\frac{2}{3}-\frac{2}{3}$ (averaging $\frac{1}{2}$) as broad as long B.
 - B. Plant sparingly and not conspicuously pilose.

B. Stems, petioles, and often the lower surfaces of the leaves densely villous-hispid with white pubescence......var. hispida.
Principal or median cauline leaves lanceolate to oblong, gradually nar-

A. Principal or median cauline leaves lanceolate to oblong, gradually narrowed or cuneate at base, $\frac{1}{5}-\frac{1}{2}$ (averaging $\frac{1}{3}$) as broad as long C. C. Bracts of the inflorescence with margins copiously bristly-ciliate with

long white hairs D.

D. Bracts green or at most with purple-tinged margins, glabrous to sparingly pilose on the back.

Calyx green or at most with purple-tinged margins.

Corolla bluish, violet or lavender.....var. lanceolata. Corolla white.....var. lanceolata, forma candida. Calyx purple.

Corolla bluish or violet var. lanceolata, forma iodocalyx.

- D. Bracts and calyx dark purple, the former densely tomentose or language on the back
- C. Bracts of the inflorescence with glabrous or sparingly short-ciliate margins.

Leaves and stems glabrous or essentially so; bracts green, or at most with purple-tinged margins; corolla violet.var. calvescens. Leaves pilose beneath: stems pilose: bracts mostly deep purple: corolla dark or blackish purple.....var. atropurpurea.

PRUNELLA VULGARIS L. Sp. Pl. 600 (1753); Am. auth. in part. Brunella vulgaris Scop. Fl. Carn. ed. 2, i. 415 (1772); Am. auth. in part.³ — Fields, roadsides, waste grounds, etc., Newfoundland and

¹ Pollard & Ball, Proc. Biol. Soc. Wash. xiii. 134 (1900).

² Benth. Lab. Gen. et Sp. 417 (1834).

³ In his New Flora, pt. 2, 29–32 (1837) Rafinesque described ten species of Brunella from eastern America. Without authentic specimens it is impossible to identify them with certainty. B. microphylla and B. sessilifolia seem too indefinite for a guess. B. heterophylla, cordata, and obtusifolia are presumably B. vulgaris; B. petiolaris, hirsuta, and reticulata are referred to var. lanceolata or one of its forms; B. rosea may possibly be the same as the plant here called var. lanceolata, forma rhodantha; and B. cinerea, from its description and range, is almost certainly var. hispida.

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eastern Quebec to North Carolina, west to Minnesota and Iowa; Wyoming; Mexico. Naturalized from Europe.

Forma ALBIFLORA (Bogenhard) Britton, Bull. Torr. Bot. Cl. xvii. 125 (1890) as Brunella. Prunella vulgaris, var. albiflora Bogenhard, Fl. Jena, 315 (1850).— Rare. Seen by me only from Brookline, Massachusetts, August 6, 1885, Faxon. Naturalized from Europe.

Var. HISPIDA Benth. Lab. Gen et Sp. 417 (1834). *P. hispida* Benth. in Wall. Pl. As. Rar. i. 66 (1830). *Brunella cinerea* Raf. New Fl. pt. 2, 30 (1837). *P. vulgaris scaberrima* Pollard & Ball, Proc. Biol. Soc. Wash. xiii. 134 (1900).— Dry woods from Kentucky and North Carolina to Florida and Louisiana. India and southern Europe.

Var. lanceolata (Barton), n. comb. P. pennsylvanica Bigel. Fl. Bost. 149 (1814); Pursh, Fl. Am. Sept. ii. 411, in part (1814); Eaton, Man. ed. 2, 383 (1818); not Willd. Hort. Berol. t. ix (1804). P. vulgaris & pennsylvanica Nutt. Gen. ii. 37 (1818). P. vulgaris & lanceolata Barton, Fl. Phil. ii. 37 (1818) and Fl. N. A. ii. 69, t. 60 (1822). P. vulgaris γ elongata Benth. Lab. Gen. et Sp. 417 (1834). P. vulgaris β major Hook. Fl. Bor.-Am. ii. 114 (1838).- This variety occurs in several color-forms. The typical plant illustrated by Barton has the bracts and calyces green and the corolla lavender or lilac-purple, but the corollas may be of quite deep purple tones. This typical var. lanceolata has been examined as follows. NEWFOUNDLAND: moist woods near Salmonier River, August 26, 1894, Robinson & Schrenk, no. 72; talus slopes of the marble region between Mt. Musgrave and Humber Mouth, Bay of Islands, July 18, 1910, Fernald & Wiegand, no. 3926; damp thicket, Bay St. George, August 5-7, 1901, Howe & Lang, no. 1008 (passing to forma iodocalyx). QUEBEC: gravel beaches near mouth of Dartmouth River, August 26 & 27, 1904, Collins, Fernald & Pease; mossy bog, altitude 600 m., between the River Ste. Anne des Monts and Table-top Mountain, July 31, 1906, Fernald & Collins, no. 713; Little Métis, August 1, 1906, J. Fowler; recent clearing, Basin Island, Magdalen Islands, Fernald, Bartram, Long & St. John, no. 7964. MAINE: fields, Orono, August 16, 1887, Fernald; South Poland, 1894, 1896, Kate Furbish; New HAMPSHIRE: roadside, Randolph, July 28, 1897, E. F. Williams; Crawford Notch, July 3, 1898, J. M. Greenman, no. 1013. VERMONT: Manchester, June 30, 1898, M. A. Day, no. 133. MASSACHUSETTS: Malden, July, 1880, R. Frohock; Oak Island, Revere, July 9, 1882, H. A. Young. CONNECTICUT: meadow and pasture, Southington, July 22, 1898, L. Andrews, no. 455. NEW YORK: Stony Creek Ponds, July 9, 1899, Rowlee, Wiegand & Hastings. PENNSYLVANIA: Buckhorn, Columbia Co., July 21, 1899, A. A. Heller. WISCONSIN: Milwaukee, Lapham; St. Croix Falls, July, 1899, Mrs. N. E. Baker. KANSAS: wet places, Riley Co., August 6, 1895, J. B. Norton, no. 412. MONTANA: Ravalli, July 15, 1908, Mrs. Joseph Clemens. COLORADO: Mancos, June 23, 1898, Baker, Earle & Tracy, no. 54; among willows, Steamboat Springs, Routt Co., July 20, 1903, L. N. Goodding, no. 1605. UTAH:

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Bear River Cañon, August, 1869, Watson, no. 833; moist soil under trees, Farmington Cañon, alt. 4300-5500 ft., July 14, 1902, Pammel & Blackwood, no. 3666. New MEXICO: Mogollon Mts., alt. 7500 ft., July 23, 1903, Metcalfe, no. 300. IDAHO: moist rich soil, Fall Creek, Elmore Co., alt. 4500 ft., August 15, 1910, Macbride, no. 613 (passing to forma iodocalyx). ARIZONA: semi-shaded grassy places along streams, Thompson Ranch, White Mts., July 12, 1910, L. N. Goodding, no. 555. CALIFORNIA: Yosemite Valley, August 8, 1891, Coville & Funston, no. 1849. OREGON: stream-banks, Wallowa Mts., August 19, 1898, Cusick, no. 2072. WASHINGTON: moist places, meadows near Mabton, Yakima Co., July 25, 1902, J. S. Cotton, no. 750. ALASKA: Sitka, Ferd. Bischoff. JAPAN: Yokohama, 1862, Maximowicz. CHINA: Ichang, March, 1886, February, 1887, A. Henry, nos. 198, 1923; Tsingten, 1901, Zimmermann, no. 287.

Var. LANCEOLATA, forma **candida**, n. f., bracteis calycibusque viridibus; corolla albida.— QUEBEC: alluvial wooded banks of River Ste. Anne des Monts, July 16, 1906, *Fernald & Collins*, no. 245. MAINE: sandy shore, Fort Fairfield, July 8, 1893, *Fernald*, August 9, 1909, *Fernald*, no. 2084 (TYPE in herb. Gray). NEW HAMPSHIRE: roadside 1 mi. north of Clarkesville, July 11, 1907, *Pease*, no. 10,982 in part. MASSACHUSETTS: Acton, June 27, 1885, *W. Deane*; mountain road, Mt. Wachusett, July 13, 1893, *J. F. Collins*; Stockbridge, August 20, 1902, *R. Hoffmann*. MICHIGAN: Keweenaw Co., July, 1890, O. A. Farwell, no. 769.

Var. LANCEOLATA, forma iodocalyx, n. f., bracteis viridibus vel marginibus purpurascentibus glabris vel sparse pilosis; calycibus purpureis; corolla violacea vel subcaerulea.-- NEWFOUNDLAND: calcareous gravelly bank, Port à Port, August 15, 1910, Fernald & Wiegand, no. 3927 (TYPE in herb. Gray). QUEBEC: Mrs. Shepard; Little Métis, August 2, 1907, J. Fowler; vicinity of Montmorenci Falls, July 5, 1905, J. Macoun, no. 67,845; Nova Scotia: dry field, near Pictou, July, 1901, Howe & Lang, no. 533. NEW BRUNSWICK: St. Andrews: June 30, 1900, J. Fowler. MAINE: dry pasture, Dover, June 29, 1896, G. B. Fernald, no. 156; woods and fields, Hartford, June, 1885, J. C. Parlin; Gilead, Kate Furbish; woodroad, Pembroke, July 17, 1909, Fernald, no. 2085; Westport, August 14, 1907, I. W. Anderson; Manchester, September 12, 1873, F. Lamson-Scribner; East Livermore, Kate Furbish; Brunswick, 1880, Kate Furbish; woods and fields, North Berwick, June 17, 1893, Parlin. NEW HAMP-SHIRE: pasture, Whitefield, July 24, 1897, W. Deane; roadside, Metallak, Pittsburg, July 6, 1907, Pease, no. 10,194; above tree-line, near Cape Horn, Mt. Washington, July 23, 1903, B. L. Robinson, no. 823; open grassy places, Jaffrey, July 4, 1897, B. L. Robinson, no. 128. VERMONT: sandy barrens, Westminster, June 16, 1898, B. L. Robinson, no. 37; MASSACHUSETTS: Manchester, July 13, 1877, W. C. Lane; East Boston, July 1, 1879, C. E. Perkins; West Roxbury, Faxon; Brewster, September 11, 1912, F. S. Collins, no. 1537; Eastham, July 10, 1901,

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F. S. Collins, no. 257. CONNECTICUT: wet meadow, July 16, 1906, R. W. Woodward. WEST VIRGINIA: along Shaver Fork, Parsons, Tucker Co., September, 1904, Greenman, no. 210. NORTH CAROLINA: Cullowhee, 1887, R. Thaxter. ONTARIO: Flat Rock Portage, Lake Nipigon, July 20, 1884, J. Macoun; Pic River, Loring. ILLINOIS: wet soil, Makanda, July 18, 1902, H. A. Gleason. MONTANA: Spanish Basin, Gallatin Co., June 30, 1897, Rydberg & Bessey, no. 4902. IDAHO: common in meadows, valley of Big Potlatch River, June 9, 1892, Sandberg, MacDougal & Heller, no. 366; dry river banks, St. Anthony, July 5, 1901, Merrill & Wilcox, no. 791. NEW MEXICO: Fendler, no. 604. ARIZONA: Summit Spring, alt. 8000 ft., July, 1874, Rothrock, no. 198. CALIFORNIA: Yosemite Valley and Mountains, 1865, J. Torrey, no. 411; north side of Donner Lake in a hillside swamp, July 22, 1903, Heller. OREGON: Clearwater, Spalding; banks of streams, Swan Lake Valley, Klamath Co., June 30, 1896, Applegate, no. 432. WASHINGTON: wet places near streams, Waitsburg, June 8, 1897, Horner, no. B412; Clark Springs, Spokane, July 10, 1902, F. O. Kreager, no. 128; gravel flat, Quinault Valley, June 28, 1902, Conard, no. 212. BRITISH COLUMBIA: edge of swamp at Goldstream, August 3, 1905, C. H. Shaw, no. 1075. MEXICO: numerous collections from the mountains. JAPAN: Sapporo, June, 1878, ex herb. Sapporo Agric. Coll. COREA: W. R. Carles, no. 33; Tsu-sima Island, 1859, C. Wilford. FAEROE ISLANDS: August 12, 1903, Paulsen.

Var. LANCEOLATA, forma **rhodantha**, n. f., bracteis viridibus vel marginibus purpurascentibus; calycibus purpureis vel purpurascentibus; corolla rosea.— QUEBEC: field near Cedar Lodge, Georgeville, July 2, 1909, A. S. Pease, no. 11,957. NEW HAMPSHIRE: in a moist meadow, 1 mile east of Canaan line, Pittsburg, July 11, 1907, A. S. Pease, no. 10,992 (TYPE in herb. N. E. B. C.); maple grove, Lombard Hill, Colebrook, July 13, 1907, Pease, no. 11,048; stony field, Randolph, June 24, 1908, Pease, no. 11,188; rocky river bank, Northumberland, July 31, 1909, Pease, no. 12,136.—Brunella rosea Raf. New Fl. pt. 2, 31 (1837) from the Alleghanies may belong here.

Var. aleutica, n. var., caulibus pilosis apice albido-tomentosis vel -lanatis; foliis oblanceolatis vel lanceolato-oblongis basi attenuatis pubescentibus integris vel undulato-dentatis; bracteis atropurpureis albido-tomentosis vel -lanatis ciliatis; calycibus atropurpureis; corolla violacea.— ALASKA: along the river, just back of the town of Unalaska August 14, 1907, E. C. Van Dyke, no. 99 (TYPE in herb. Gray).

Var. calvescens, n. var., caulibus foliisque glabris vel glabratis; foliis caulinis oblongis vel oblanceolatis apice obtusis vel acutis basi attenuatis laminis 3–7 cm. longis 1–2.5 cm. latis integris vel dentatis; bracteis viridibus vel marginibus purpurascentibus eciliatis vel sparse breviter ciliatis; calycibus purpureis glabris vel sparse setulosis; corolla violacea. — BRITISH COLUMBIA: vicinity of Nanaimo, Vancouver Island, July 14, 1893, J. Macoun, no. 17,954; edge of forest, District of Renfrew, Vancouver Island, June–July, 1901, Rosendahl &

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Brand, no. 1 (TYPE in herb. Gray); Howser Station, Selkirk Mts. June 20, 1905, C. H. Shaw, no. 734. WASHINGTON: Cascade Mts., lat. 49°, 1859, Lyall; near Kettle Falls, Old Fort Colville, October 3, 1880, S. Watson, no. 332; Muckleshute Prairie, Dr. Ruhn; low ground Western Klickitat Co., June 21, 1894, Suksdorf, no. 1445. IDAHO: West Kootenay, 1861, Lyall. WYOMING: moist ground about the Mammoth Hot Springs, Yellowstone National Park, July 21, 1899, A. & E. Nelson, no. 6042 in part (this number in herb. Gray is a mixture of var. calvescens and var. lanceolata, forma iodocalyx).

Var. atropurpurea, n. var., caulibus pilosis apice albido-tomentosis; foliis caulinis lanceolatis 5–8 cm. longis 1–2.5 cm. latis integris vel undulato-dentatis apice subacutis basi attenuatis subtus pilosis; bracteis inferioribus viridibus pilosis, reliquis purpureis glabris marginibus breviter ciliatis vel eciliatis; corolla atropurpurea.— CALIFORNIA: Santa Rosa, Sonoma Co., June 4, 1902, A. A. Heller, no. 5639 (TYPE in herb. Gray).

GRAY HERBARIUM.

LUZULA CAMPESTRIS, VAR. FRIGIDA IN NEW HAMPSHIRE.— Early this summer I noticed in a grassy field near the village of Wolfeboro, New Hampshire, a number of dense tufts of a dark green Luzula. It ripened ten days or more later than Luzula campestris, var. multiflora, which was also abu dant, and proved to be L. campestris, var. frigida, a northern form of the species. Later I found the var. frigida abundantly in an adjoining field, and then in another some three miles distant, indicating that it is not very uncommon here.

As Professors Fernald and Wiegand in their revision of the group in Rhodora for February, 1913, give eastern Maine as the southern limit of this variety, the discovery of it in Wolfeboro makes a considerable southern extension of the range, and it may be expected elsewhere in New Hampshire and Maine. Specimens have been deposited in the herbarium of the New England Botanical Club and in the Gray Herbarium.— H. E. SARGENT, Brewster Free Academy, Wolfeboro, New Hampshire.

CAREX TINCTA A VALID SPECIES.— CAREX tincta (Fernald), n. comb. C. mirabilis, var. tincta Fernald, Proc. Am. Acad. xxxvii. 473 (1902). When this plant was first put forward as a variety of C. mirabilis it was so treated with some doubt and with the comment: "Resembling northwestern forms of the polymorphous festiva group



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