

VARIANTS IN TWO SPECIES OF DELPHINIUM

LILY M. PERRY

WHEN the herbarium material of *Delphinium carolinianum* and *D. virescens* came to hand to be put in order, my attention was directed to the variation in the pubescence of the stems. Two types of trichomes may be present either on the same or on different plants: the one white, crisp, retrorse and closely appressed to the stem; the other yellowish, with bulbous base (glandular) and spreading, nearly or quite at right angles. Since apparently, in the material at hand, the relative position of these on the stem is correlated with a definite geographical range, the following varieties are proposed.

- a. Seeds wing-margined with rugose, slightly (if at all) squamellate sides; spur $1\frac{1}{2}$ times the length of the upper sepal; flowers prevailing blue (at times whitish)....b.
- b. Upper part of stem glandular-pubescent, lower usually crisp-pubescent (at times glandular).
Pubescence not copious; seeds winged, rugose.
D. carolinianum (typical).
Pubescence copious (tending to be floccose); seeds strongly winged, markedly rugose.....Var. *Nortonianum*.
- b. Both upper and lower part of stem crisp-pubescent.....Var. *crispum*.
- a. Seeds not wing-margined but usually more or less angled, with strongly rugose-squamellate sides; spur $1\frac{1}{2}$ -twice the length of the upper sepal; flowers prevailing white or whitish (at times bluish)....c.
- c. Stem in some part glandular-pubescent.
Upper part of stem glandular-pubescent, lower crisp-pubescent.....*D. virescens* (typical).
Upper part of stem crisp-pubescent, lower glandular-pubescent.....Var. *Penardi*.
- c. Stem crisp-pubescent throughout.....*D. vimineum* (typical).

D. CAROLINIANUM Walter, Fl. Car. 155 (1788). *D. azureum* Michx. Fl. Bor.-Am. i. 314 (1803); Deless. Ic. i. t. 60 (1820). GEORGIA: Augusta, June, 1888, G. McCarthy; Athens, L. M. Perry, nos. 862, 863; Chickamauga Park, May 27, 1911, J. R. Churchill; without data, Neisler. KENTUCKY: barrens, C. W. Short. MISSOURI: southeast of Cedar Gap, O. E. Lansing, Jr., no. 3073. LOUISIANA: Red River, Hale. TEXAS: Mineola, J. Reverchon, no. 4341; Grand Saline, J. Reverchon, no. 3699; vicinity of Huntsville, R. A. Dixon, no. 356; Sefkey Swamp, Gonzales Co., V. L. Cory, no. 5683; $12\frac{1}{4}$ miles north of Bracketville, V. L. Cory, no. 6103.

Var. **Nortonianum** (Mackenz. & Bush), comb. nov. *D. Nortonianum* Mackenz. & Bush in Trans. Acad. Sci. St. Louis, xii. 82 (1902). *D. azureum*, var. *Nortonianum* Palmer & Steyermark in Ann. Mo. Bot. Gard. xxii. 543 (1935). MISSOURI: Monteer, B. F. Bush, no. 377; 1 mile west of Mansfield, O. E. Lansing, Jr., no. 3133.

With the few specimens at hand it is hard to tell the real differences

between this and the typical variety. The seeds are slightly larger in the specimen at hand. Whether they would always average so is a matter requiring either field observation or some further collections of at least nearly mature seeds.

Var. **crispum**, var. nov. Caule pubescente pilis retrorsis crispatisque. ILLINOIS: Milroy, July 7, 1908, *H. A. Gleason* (TYPE in Gray Herb.); Warsaw, June 17, 1847, *S. B. Mead*. MISSOURI: between Springfield and St. Louis, *S. D. McKelvey*, no. 2526; Eagle Rock, *B. F. Bush*, no. 228; Swan, *B. F. Bush*, no. 188; Greene Co., May 31, 1888, *J. W. Blankinship*. ARKANSAS: Prescott, *B. F. Bush*, no. 253. OKLAHOMA: near Page, *O. W. Blakley*, no. 1419; Howe, *E. J. Palmer*, no. 39,341.

None of the specimens here cited have mature seeds. The flowers may be blue or whitish; all stems lack the glandular pubescence characteristic of typical *D. carolinianum*.

D. VIRESCENS Nutt. Gen. ii. 14 (1818). *D. albescens* Rydberg in Bull. Torr. Bot. Cl. xxvi. 583 (1899). WISCONSIN: St. Croix Falls, July 3, 1899, *Mrs. N. E. Baker*. MANITOBA: Winnipeg Valley, 1859, *Bourgeau*; Lake Winnipeg, *Houghton*. MINNESOTA: St. Anthony, July 12, 1888, *J. H. Schuette*; Minneapolis, *J. H. Sandberg*, no. 280. IOWA: Fayette, June 25, 1894, *B. Fink*; Decatur Co., June 16, 1896, *T. J. & M. L. Fitzpatrick*. MISSOURI: Watson, *B. F. Bush*, no. 8; Westport, *B. F. Bush*, no. 613. NORTH DAKOTA: Fargo, July 9, 1909, *H. F. Bergman*. SOUTH DAKOTA: Interior, *E. J. Palmer*, no. 37,629. NEBRASKA: on Middle Loup River, near Thedford, *P. A. Rydberg*, no. 1360; Neligh, June 3, 1896, *E. S. Bacon*. KANSAS: prairies, Riley Co., *J. B. Norton*, nos. 8, 8a. OKLAHOMA: west of Tulsa, *S. D. McKelvey*, nos. 2501, 2514; near Alva, *G. W. Stevens*, no. 551. TEXAS: Tarrant Co., *A. Ruth*, no. 374; Victoria, *S. M. Tracy*, no. 9243.

This species is said to have a stouter habit than *D. carolinianum* and in the herbarium material here that is true; on the other hand, I distinctly recall practically covering an entire rolling slope where *D. carolinianum* was rampant before I found plants small enough to make good herbarium specimens. Color of the flower is not reliable except in combination with other characteristics. A number of specimens of *D. virescens* have decidedly hooked spurs, others (but not all) show a definite tendency in that direction. Perhaps the best distinguishing feature is found in the mature (or nearly mature) seeds; unfortunately not a quarter of our specimens have reached that point of development; consequently, in a group with not too definite specific lines, it is difficult to determine such collections.

Var. **Penardi** (Huth), comb. nov. *D. Penardi* Huth in *Helios*, x.

34—repr. Delph. Art. Ber. Staat. 10 (1892) and in Bull. Herb. Boiss. i. 335, t. 16, fig. 2 (1893). Differs from the typical variety in having the lower part of the stem glandular-pubescent and the upper crisp-pubescent. NEBRASKA: Callaway, June 15, 1901, *J. M. Bates* in part. KANSAS: prairie, Ellis Co., June 16, 1882, *G. C. Deane*; east of Liberal, *S. D. McKelvey*, no. 2491. OKLAHOMA: near Shattuck, *R. L. Clifton*, no. 3127. COLORADO: New Windsor, June 21, 1905, *G. E. Osterhout*; Poudre Flats, north of Fort Collins, June 27, 1895, *J. H. Cowen*; along railway west of Fort Collins, June 20, 1896, *C. S. Crandall*; Denver, *I. W. Clokey*, no. 3091. TEXAS: Amarillo, *J. Reverchon*, no. 2959; Comanche Spring, New Braunfels, etc., *Lindheimer*, no. 660.

There are also two specimens collected at Noel, Missouri, by *B. F. Bush*. The lack of mature seeds in most of these specimens is a decided handicap in any effort to determine them.

D. VIMINEUM Don in Sweet, Brit. Fl. Gard. ser. 2, iv. t. 374 (1838). Texas and Mexico.

This species so closely resembles *D. virescens* in habit that I mention it here. Although it differs in the crisp-pubescent stem, occasionally somewhat bluer flowers and darker brown seeds, further collections may prove it is not more than a variety of *D. virescens*.

GRAY HERBARIUM.

NOTES ON THE DISTRIBUTION AND HYBRID ORIGIN OF \times SOLIDAGO ASPERULA

RICHARD H. GOODWIN

(Plate 453)

IN 1900 Graves¹ published a note on "a little-known New England golden-rod" which Professor M. L. Fernald considered satisfactorily referable to *Solidago asperula* Desf.² Concerning the nature of the plant Graves wrote, "Dr. Gray, to whom most of the Massachusetts specimens were submitted, classed them doubtfully as hybrids between *S. rugosa* Mill. and *S. sempervirens* L. Later students, however, have been more inclined to regard this form as entitled to specific rank." Since then, accumulating evidence from field observations has led botanists to agree with Dr. Gray. The seventh edition of Gray's Manual (1908) lists the plant as a probable hybrid between *S. rugosa* and *S. sempervirens*.

¹ RHODORA 2 (15): 57-59. 1900.

² Desfontaines, Cat. Hort. Paris ed. 3: 403. 1829.



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