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OXALIS CORNICULATA AND ITS RELATIVES IN NORTH AMERICA.

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(Continued from page 124.)

6. *O. FLORIDA* Salisb. Prod. Strip. All. 322 (1796). *O. Dillenii* β *florida* DC. Prodr. i. 692 (1824). *O. glauca* Raf. in DC. l. c. *O. filipes* Robins. & Fernald in Gray's Man. ed. 7, not Small. *O. Brittoniae* Small in Britton's Man. 577 (1901). *Xanthoxalis Brittoniae* Small, Fl. S. e. U. S. 668 (1903), and N. A. Flora. *X. coloreae* Small, Fl. S. e. U. S. 668 (1903), *O. coloreae* Fedde in Just's Bot. Jahresb., xxxii. Pt. 1, 410 (1905).—Stems erect, rarely decumbent at base, brownish when dry; leaves scattered on slender loosely hairy petioles; stipules nearly obsolete; leaflets 5–18 mm. broad, glabrous above, slightly hairy beneath, green or sometimes purple, glaucous; peduncles exceeding the leaves; pedicels 5–25 mm. long, slender, substrigose; flowers 7–11 mm. long, heterogamous (?); corolla glabrous; filaments smooth or hairy; capsule short-cylindrical, gradually tapering toward apex; styles long and slender (3–4 mm. long), sometimes short (2 mm. long); seeds 1.0–1.2 mm. long, poorly developed.—Chiefly in dry fields of light or stony soil; Maine to central New York and Florida, mainly toward the coast but apparently not on the Coastal Plain. Some specimens examined: MAINE: Falmouth, *E. B. Chamberlain* & *J. F. Collins*, no. 597; North Belgrade, *M. L. Fernald*. NEW HAMPSHIRE: Merrimack county, 1916, *H. L. Clark*. VERMONT: Brookline, 1917, *L. A. Wheeler*. MASSACHUSETTS: Attleboro, 1916, *F. F. Forbes*; Northampton and Sheffield, *M. L. Fernald*; six other specimens all from western Massachusetts. RHODE ISLAND: Cumberland, 1904, *B. L. Robinson*, *E. F. Williams*. CONNECTICUT: West Hartford, 1904, *C. H. Bissell*; Salisbury, and Lakeville, 1902, *Fernald*, also others; Southbury, *C. A. Weatherby*, no. 1739; Fairfield, *E. H. Eames*, no. 8340; Oxford, 1903 and 1904, *E. B. Harger*; West Cheshire, *A. E. Blewitt*, no. 853. NEW YORK: northern N. Y., *A. Gray* (?); central N. Y., *A. J. Eames* & *L. H. MacDaniels*, no. 2736, 4478,

Wiegand & Eames, no. 10201, 12370, *A. J. Eames*, no. 10202, 10203, 13694, *K. M. Wiegand*, no. 12368, 12369, 14003, 14810, 14811; VanCortlandt, N. Y. City, and Riverdale, *E. P. Bicknell*; Bronx Park, *G. V. Nash*. PENNSYLVANIA: Lancaster County, 1900, *A. A. Heller*. VIRGINIA: Williamsburg, *E. J. Grimes*, no. 3849. NORTH CAROLINA: Madison County, *J. R. Churchill*; Biltmore, *Biltmore Herb.* no. 5383a. FLORIDA: Duval County, 1897, *J. R. Churchill*.

Var. **strigosifolia** var. nov. Foliis pagina superiori strigosis. Upper surface of the leaves strigose. New Hampshire, New York and Missouri. Specimens examined: NEW HAMPSHIRE: Walpole, 1903, *W. W. Eggleston*; North Walpole, 1903, *W. H. Blanchard*. NEW YORK: Spencer, *K. M. Wiegand*, no. 14811 (TYPE in Cornell Herb.). MISSOURI: Doniphan, *B. F. Bush*, no. 277. ? ARKANSAS: Camden, 1850, *A. Fendler*.

With some hesitation the name *O. florida* Salisb. has been adopted for this species. Salisbury cited "Oxy lutea americana humilior et annua. Dill. Hort. Elth. 298 t. 221 f. 288" on which *O. Dillenii* Jacq. was founded, and which is interpreted as *O. stricta*. In his description, however, he said, "stylis filamentis longioribus. . . . Herba nostrae stirpis saturate purpurea." which suggests *O. europaea* or the present species. De Candolle (Prodr.), who seems to have had some definite knowledge of the Salisbury plant, considered the name a synonym of *O. glauca* Raf. (then ined.), and both a variety of *O. stricta* (*O. Dillenii*). In the Gray Herbarium are two specimens of the present species that were compared by Professor Fernald with plants in the De Candollean herbarium. One bears a note by Fernald as follows: "This specimen except that it is more mature is quite the same as a specimen of 'Oxalis florida Sal. - Dillenii Jacq. M. Salisbury 1816' [The latter in handwriting of DC.] under *O. Dillenii*, β *florida* in Prodr. Herb." The other bears this inscription by Fernald: "This is exactly matched (1 & 2) by the specimen of 'Oxalis glauca Raf. n. sp. ? Philada. Rafinesque, 1819' in Prodr. Herb. under *O. Dillenii* β *florida* [underscored portion of label Rafinesque's; the other DC's.]" It seems most likely therefore that Salisbury's plant belonged to the present species, as did also Rafinesque's.

7. *O. EUROPAEA* Jord. in Schultz, Arch. Fl. Franc. et Allem. 309 (1854). *O. ambigua* Salisb. Trans. Linn. Soc. ii. 242 (1794), not Jacq. Oxal. 80 (1794). *O. stricta* of most early authors, also Trelease in Gray's Synopt. Fl. i. 366 (1897). *O. corniculata* var. *stricta* Trelease, Mem. Bost. Soc. Nat. Hist. iv. 88 (1888). *O. corniculata* Robinson & Fernald in Gray's Man. ed. 7. 534 (1908).—Stem 5–40 cm. high, simple or branched, usually erect, clothed with scattered ascending

hairs or glabrate; leaflets 33 mm. broad or smaller, generally thin, glabrous above, glabrate beneath; petioles 2–8 cm. long, slender, nearly or quite glabrous; peduncles generally exceeding the subtending leaves, slender, with a few strigose hairs; pedicels slender, strigose; calyx 3–5 mm. long, nearly or quite glabrous; flowers homogamous; corolla 5–10 mm. long, glabrous; filaments glabrous or hairy; capsule 8–12 mm. long, gradually acute; style short (2 mm. long), less commonly elongated (4 mm. long); seeds 1.2 (1.4) mm. long.—Quebec to North Dakota, southward to Georgia, Tennessee, Oklahoma, Colorado and Arizona; also introduced in Europe and probably in other countries. Apparently not common on the Atlantic Coastal Plain of North America.

Forma **pilosella** f. nov. Ab *O. europaea* typica recedit caulibus villosis. Similar to the typical form of *O. europaea* in pubescence of leaves and pedicels but stem and generally the petioles and peduncles villous. Rhode Island, Missouri and probably elsewhere. Specimens examined: RHODE ISLAND: Middletown, Margaret B. Simmons. MISSOURI: Greenwood, B. F. Bush, no. 6701 (TYPE in Gray Herb.).

Forma **cymosa** (Small) comb. nov. *O. cymosa* Small, Bull. Torr. Bot. Club xxiii. 267 (1896). *O. rufa* Small, in Britton's Man. 577 (1901). *Xanthoxalis cymosa* Small, Fl. S. e. U. S. 668 (1903), and N. A. Flora.—Stem nearly or quite glabrous; upper surface of leaflets glabrous; pedicels villous and more or less viscid. Quebec to Michigan, southward to North Carolina, Tennessee and Missouri. A common form in the northeastern United States, but apparently not common on the Atlantic Coastal Plain. The identification of *O. cymosa* Small with this form rests on Small's statement of stem subglabrate and pedicels villous.

Forma **villicaulis** f. nov. Formae *cymosae* similis sed caulibus villosis. Similar to forma *cymosa* but the stems villous. Chiefly in the interior: Nova Scotia and Massachusetts to Michigan, southward to Virginia, Tennessee, and Illinois. Many specimens were seen: type specimen (in Gray Herb.), Port Huron, Michigan, 1914, C. K. Dodge, no. 41.

Var. **Bushii** (Small) comb. nov. *O. Bushii* Small, Bull. Torr. Bot. Club xxv. 611 (1898). *Xanthoxalis Bushii* Small, Fl. S. e. U. S. 667 (1903). *X. interior* Small, Fl. S. e. U. S. 668 (1903). *O. interior* Fedde in Just's Bot. Jahresb. xxxii. pt. 1, 410 (1905).—Stem conspicuously villous; petioles and peduncles generally more or less villous; upper surface of the leaflets with scattered hairs; pedicels strigose, not viscid. Waverley, Massachusetts, and from western Ontario to Michigan, Illinois and Missouri. Specimens examined: MASSACHUSETTS: Waverley, 1895, Robinson, Greenman & Schrenk. ONTARIO: Lambton County, C. K. Dodge, no. 42. MICHIGAN: Port Huron, Dodge, no. 40. ILLINOIS: Urbana, 1901, H. A. Gleason; Morgan Park, A. Chase, no. 925. MISSOURI: many specimens, Bush, no. 30 (type collection), 315, 3283, 3297, 4032, 6754.

Forma **subglabrata** f. nov. Ab var. *Bushii* recedit caulibus substrigosis vel glabratis. Differing from var. *Bushii* in the glabrate or substrigose stems.—Illinois, Missouri and Iowa. Specimens examined: ILLINOIS: Peoria, 1903, *F. E. McDonald*. MISSOURI: Courtney, *B. F. Bush*, no. 7678. IOWA: Ames, *Pammel & Ball*, no. 4 (TYPE in Gray Herb.).

Forma **vestita** f. nov. Var. *Bushii* similis sed caulibus villosis et pedicellis villosis viscidis. Similar to var. *Bushii* but stems and pedicels villous, the latter usually viscid. Massachusetts and Illinois. Specimens examined: MASSACHUSETTS: Cambridge, 1904, *Miss I. W. Anderson* (TYPE in Gray Herb.). ILLINOIS: Riverdale, *O. E. Lansing Jr.*, no. 2625; La Salle County, *Greenman, Lansing & Dixon*, no. 144; Makanda, 1902, *H. A. Gleason*, no. 2449.

O. europaea is with little doubt a native of America, but was introduced into Europe about 1658. It seems to have been cultivated by Morison in 1660 and was figured by him in his *Historia*. An outline of the early history of this species in Europe is given by Ascherson and Graebner.¹ The European material all has appressed-pubescent pedicels (except one specimen from Germany), subglabrous stems, and glabrous upper leaf surfaces, and this form is therefore taken as the type of the species.

8. *O. GRANDIS* Small, Bull. Torr. Bot. Club, xxi. 475 (1894). *O. recurva* Trelease, Mem. Bost. Soc. Nat. Hist. iv. 89 (1888), not Ell. *Xanthoxalis grandis* Small, Fl. S. e. U. S. 668 (1903), and N. A. Flora.—Plants tall and coarse, erect; stems very sparingly pubescent with scattered subappressed or spreading hairs; stipules nearly obsolete; petioles villous; leaflets glabrous above and with a few hairs beneath; peduncles scarcely exceeding the leaves, strigose or more commonly villous; inflorescence umbellate or sometimes cymose, 1-several-flowered; pedicels slender, strigose; corolla 12–18 mm. long, glabrous; filaments generally hairy; capsules short-oblong-ovoid, 7–10 mm. long; seeds (fide Small) 2 mm. long.—Pennsylvania to Illinois, southward to Georgia and Alabama (Small), but not along the coast. Specimens examined: PENNSYLVANIA: Wysox, *Carey* (type collection?). DISTRICT OF COLUMBIA: 1897, *E. S. Steele*. VIRGINIA: Smyth County, 1892, *J. K. Small*. NORTH CAROLINA: Waynesville, *E. E. Magee*; Polk County, 1899, *J. R. Churchill*; Biltmore, *Biltmore Herb.*, no. 1225a; Swain County, 1891, *Beardslee & Kofoid*. KENTUCKY: Harlan County, 1893, *T. H. Kearney Jr.*, no. 11 and 280; Knoxville, *A. Ruth*, no. 282. OHIO: *Werner*; Cincinnati, *C. G. Lloyd*. ILLINOIS: near Mt. Carnel, *J. Schneck*.

This species is related to *O. europaea* of which in appearance it seems to be a gigantic form, but the capsules are short even for that species

¹ Synop. Mitteleu. Fl. vii. 149 (1913).

and the seeds according to Small's description are larger and may have more interrupted ridges. Mature seeds have not been seen by the writer. In one specimen (Cincinnati, C. G. Lloyd) the leaves are strigose above and the plant is otherwise much more hairy than usual.

9. *O. SUKSDORFII* Trelease, Mem. Bost. Soc. Nat. Hist. iv. 89 (1888), Small, Bull. Torr. Bot. Club xxiii. 456 (1896). *O. pumila* Nutt. in Torr. & Gray's Fl. N. A. i. 212 (1838), not d'Urv. (1826). *Xanthoxalis Suksdorfii* Small, N. A. Flora xxv. 53 (1907).—Stems 5–18 cm. high, generally erect from creeping woody stolons, rather slender, sparingly villous; stipules oblong or generally nearly obsolete; petioles filiform, villous; peduncles slender, appressed-villous; pedicels filiform, 6–20 mm. long, strigose; corolla 12–16 mm. long, glabrous; filaments generally hairy; capsule very short-oblong or ovoid-conic, little exceeding the calyx, tapering toward apex, crisp-puberulent. Banks and woods, yards and parks: Oregon (California, Small¹).

The writer has not seen specimens of this species from California, but the plant may possibly occur in that part of the state bordering Oregon. *O. pumila* d'Urv.,² though regarded in the Index Kewensis, as a synonym of *O. enneaphylla* Cav. is not certainly so, and therefore, according to the International Rules, Nuttall's name should not be used.

10. *O. RECURVA* Ell. Sketch Bot. S. Car. and Ga. i. 526 (1821); Small, Bull. Torr. Bot. Club, xxi. 474 (1894); Britton & Brown's Ill. Fl. N. Sta. and Can. ed. 1. (1898); Britton, Manual N. Sta. & Can. 577 (1901); also in part, Trelease in Gray's Synopt Fl. i. 366 (1897), not Trelease in Mem. Bost. Soc. Nat. Hist. iv. 89 (1888). ? *O. Lyoni* Pursh, Fl. Am. Sept. i. 322 (1814). *Xanthoxalis recurva* Small, Fl. S. e. U. S. 668 (1903), and N. A. Flora.—Stems upright, 5–15 cm. high, from creeping rootstocks, villous with more or less spreading tawny hairs; petioles slender, villous; stipules small or obsolete; leaflets rather thin, glabrous above, sparingly hairy beneath; peduncles with subappressed pubescence; pedicels slender, 7–18 mm. long, strigose; corolla 13–18 mm. long, glabrous; filaments generally hairy; mature capsule not seen (slender according to Small).—Dry sandy more or less open soil: North Carolina to Georgia. Specimens examined: NORTH CAROLINA: Columbus, 1900, *E. C. Townsend*, (Cornell Herb.). SOUTH CAROLINA: Coastal Plain near Ashley River, *B. L. Robinson*, no. 188. GEORGIA: Sylvania, *R. M. Harper*, no. 2082.

Trelease extended the range of this species to Pennsylvania and Texas, and Small attributed it to Missouri and Mississippi. The writer has not seen specimens from these states. According to Small

¹ Bull. Torr. Bot. Club xxiii. 456 (1896), and N. A. Flora.

² Mém. Soc. Linn. Paris iv. 616 (1826).

the above form agrees well with Elliott's type in the Charleston Museum.

Var. **texana** (Small) comb. nov. *Xanthoxalis texana* Small, Fl. S. e. U. S. 667 (1903), and N. A. Flora. *O. texana* Fedde in Just's Bot. Jahresb. xxxii. pt. i. 410 (1905). Similar to typical *O. recurva* in habit but the stems, petioles and pedicels appressed-pubescent; leaflets either glabrous or hairy on the upper surface. TEXAS: Wright (type collection?). MEXICO: Monterey, W. M. Canby, no. 54.

Var. **macrantha** (Trelease) comb. nov. *O. corniculata*, var. ? *macrantha* Trelease, Mem. Bost. Soc. Nat. Hist. iv. 88 (1888). *O. macrantha* Small, Bull. Torr. Bot. Club xxiii. 268 (1896), not of Fl. S. e. U. S., nor of N. A. Flora. *O. recurva* in part, Trelease in Gray's Synopt. Fl. l. c. *O. hirsuticaulis* Small, Bull. Torr. Bot. Club, xxv. 611 (1898). *Xanthoxalis hirsuticaulis* Small, Fl. S. e. U. S. 669 (1903), and N. A. Flora. *O. Priceae* Small, Bull. Torr. Club, xxv. 612 (1898). *Xanthoxalis Priceae* Small, Fl. S. e. U. S. 669 (1903).—Stems and petioles shaggy with spreading pubescence; peduncles pilose; corolla sparsely hairy outside or glabrate; filaments generally hairy; capsule cylindrical, about 15 mm. long; seeds 1.4 mm. long.—Kentucky, Tennessee, and Alabama. Specimens examined: KENTUCKY: Bowling Green, 1889 and 1900, Sadie F. Price. ALABAMA: Hatch.

Forma **sericea** f. nov. Ab var. *macrantha* recedit foliis utrinque strigosis. Leaflets rather strongly appressed hairy on both faces. ALABAMA: old specimen in Gray Herb. (TYPE.)

Var. **floridana** var. nov. *Xanthoxalis macrantha* Small Fl. S. e. U. S. 667 (1903), probably, and N. A. Flora, not *O. macrantha* Small, Bull. Torr. Bot. Club. xxiii. 268 (1896). *O. recurva*, in part, Trelease, in Gray's Synopt. Fl. i. 366 (1897).—Caulibus subadpresso-pubescentibus, foliis pagina superiori strigosis. Stems more diffuse than in the typical form, from less evident rootstocks and with more ascending pubescence; peduncles shorter; leaflets strigose on the upper surface; pedicels with appressed pubescence.—Florida. Specimens examined: Apalachicola, Drummond. East Florida, Herb. D. C. Eaton (TYPE in Gray Herb.).

The writer can find no good specific characters to separate *O. recurva* and its var. *floridana*, *O. texana*, *O. macrantha* and *O. Priceae* as is done by Small. The differences seem to be in degree and type of pubescence only, and even these differences vary greatly. With the exception of the var. *floridana* the plants all have a rather characteristic appearance, consisting of an erect stem arising from long horizontal rootstocks and surmounted by flowers rising considerably above the leaves.

The nomenclature in this group of large flowered eastern forms is difficult to decipher. The identity of *O. recurva* Ell. is now quite

certain, as Small has seen the type. Trelease's transfer of the name to what is now *O. grandis* was an error. The *O. corniculata*, var.? *macrantha* Trelease was incompletely understood, as the author himself indicated by the question mark. It probably included some specimens of the western *O. Wrightii*, var. *pilosa* as well as the eastern type. The variety was described as having the branches i. e. the upright stems?) pilose. Specimens in the Gray Herbarium marked var. *macrantha* by Trelease have hirsute or pilose stems. Small based his species *O. macrantha* on the var. *macrantha* of Trelease and described the stems as "hirsute" and petioles "pubescent like the stem." Later however he described *O. hirsuticaulis* as having "densely hirsute" stems, and the petioles "villous-hirsute," at the same time transferring the name *O. macrantha*¹ to a plant with "strigillose" stems and "strigillose" pedicels. *O. macrantha* rather than *O. hirsuticaulis* is therefore the proper name for the hirsute form of *O. recurva*. The original description of *O. Priceae* Small also agrees with our var. *macrantha*, as do two specimens of *O. Priceae* in the Gray Herbarium collected by Miss Price. Small states² that a pubescent corolla has been found by him only in *O. Priceae* among the yellow flowered species of *Oxalis*. The specimens of var. *macrantha* cited above all have some hairs on the corolla.

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A WHITE FORM OF DELPHINIUM AJACIS.

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DURING the summer of 1924, while collecting representative types of New England flowering plants for the Washington Square College Herbarium at New York University, I found two localities where a pure white growth of *Delphinium Ajacis* L. was abundant. Both areas were wet, waste ground. The first growth was noted in Forest Hills, Massachusetts, on July 24, 1924. The other station was in Raymond, New Hampshire, on August 13, 1924.

The genus *Delphinium* includes only two unipistillate species in the United States; namely,—*D. Ajacis* L. (Rocket Larkspur), with pubescent follicles and *D. Consolida* L. (Field Larkspur), with glabrous

¹ Fl. S. e. U. S. 667 (1903).

² Bull. Torr. Bot. Club xxv. 613 (1898).



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