

THE ACANTHACEAE OF ILLINOIS

GLEN WINTERRINGER

University of Illinois, Urbana

This study deals with the genera and species of the Acanthaceae¹ known to occur in Illinois. It is intended to present an account of the members of this family, with a means of their identification. Attention has been given to the study of *Ruellia*, with special regard to the status of *Ruellia humilis* Nutt. and *R. ciliosa* Pursh. The data for the study of geographical distribution, and taxonomic characters of genera and species have been taken from specimens in the herbarium of the University of Illinois and that of the Illinois State Natural History Survey.

The writer wishes to express gratitude for the privilege of using facilities of the Natural History Library of the University of Illinois. Generous assistance furnished by Dr. G. N. Jones of the botany department as to bibliographical material, suggestions for style of arrangement, and taxonomic concepts involved has been valuable. Thanks are due L. R. Tehon and R. A. Evers of the Natural History Survey for making available many of the herbarium specimens used in this study.

Keys are provided for the identification of the genera and the species. The statements of geographical range have been based upon P. A. Rydberg's *Flora of the Prairies and Plains of Central North America*, (1932).

¹ Acanthaceae, a family of 175 genera and about 2000 species.

KEY TO THE ILLINOIS GENERA

1. Corolla two-lipped, fertile stamens 2; plants growing in water or along muddy shores; leaves entire, lanceolate *Dianthera*
1. Corolla nearly regular, fertile stamens 4; plants of drier habitat; leaves broader *Ruellia*

Dianthera americana L. Sp. Pl. 27 (1753).

Lapham (1857) 526; Patterson (1874) 11, (1876) 28; Brendel (1887) 86; Huett (1897) 112; Pepon (1927) 471; McDougall (1936) 315; Fuller (1943) 98; Jones (1945) 233.

Justicia americana (L.) Vahl, Symb. Bot. 2: 15 (1791).

Type locality: "Habitat in Virginia."

Range: Common along muddy shores of streams, and margins of shallow ponds and lakes from Quebec to Wisconsin and south to Kansas, Texas, and Georgia. Flowering from July to September.

Adams County: Burton Creek near the cave, 4 June 1943, R. A. Evers 1138. Waters of Camp Creek, 29 May 1932, Pepon & Barrett 2241.

Champaign County: Wet bank along Salt Fork near Sidney, 3 October 1940, G. N. Jones 13216; 20 July 1940, G. N. Jones 12460. Urbana, 7 July 1886, Waite. In ditch, St. Joseph, 24 July 1928, McDougall 152. Sandy bottom, shallow water Middle Fork of Vermilion River, 18 October 1928, Tehon & Thompson 2246.

Coles County: Paradise Lake, in water two feet deep, 8 June 1929, D. H. Thompson 2244.

Cook County: Palos Park, 6 June 1906, H. C. Cowles.

Fayette County: Dismal Creek, northeast of Farina, 14 July 1940, Louise O'Dell 375.

Grundy County: Mazon Creek, 12 June 1932, Pepon & Barrett 5183.

Hardin County: River strand plant on limestone boulder in Ohio River near Elizabethtown, 24 June 1931, J. Schopf 2243.

Henderson County: Oquawka, H. N. Patterson.

Jefferson County: Margin of pond, 1 June 1932, Pepon & Barrett 5233.

Kankakee County: Kankakee River northwest of Kankakee, 3 August 1912, Sherff 1603. Sandy flats along Kankakee River, 19 June 1937, R. A. Schneider 2250.

LaSalle County: Little Vermilion River at Troy Grove, 8 September 1931, Pepon & Foster 970.

Livingston County: Pontiac, 25 July 1944, G. D. Fuller 9146.

Macon County: Lake Decatur, upper end, 26 July 1929, W. Luce.

Macoupin County: Carlinville, 2 July 1890, W. E. Andrews. Gravelly and sandy soil near Carlinville, 13 July 1940, G. D. Fuller 2248. Carlinville, 23 August 1882, C. Robertson 2252.

Pope County: In Big Grand Pierre Creek northeast of Golconda, 19 July 1941, G. H. Boewe. Two miles east of Herod, 7 July 1931, J. Schopf 2242.

Union County: Mill Creek, 1 June 1932, Pepon & Barrett 4520

Vermilion County: Seymour & Butts, 24 June 1880.

Wabash County: Wabash River at Mt. Carmel, 8 June 1894, J. Schneck. Sandy shore, Wabash River, 10 June 1932, Pepon & Barrett 5139.

Wayne County: Shallow water, 13 June 1944, G. D. Fuller 8709.

Williamson County: Grassy Creek at Devil's Kitchen, 2 June 1941, McCree 806.

KEY TO THE ILLINOIS SPECIES OF RUELLIA

1. Stem simple to slightly branched, leaves lanceolate, oblong to ovate.
 2. Calyx segments lanceolate, 2-4 mm. broad, capsule glabrous.*R. strepens*
 2. Calyx segments 0.5-1 mm. wide, tapering to the tip, capsule pilose; flowers on slender peduncles*R. pedunculata*
1. Stem decumbent with bushy habit, leaves narrow, oblong, lanceolate, the tips blunt or rounded, coarsely villous; calyx 1.5-2.5 cm. long; capsule glabrous.*R. humilis*

Because of variations among some of the specimens of *R. humilis* Nutt., naming of intergrading varieties and forms has been omitted from the present treatment of Illinois species of this genus. Neglect of original descriptions may be a basic reason for the fact that much confusion

seems to have existed for a century over the correct identification of *R. humilis* Nutt. and *R. ciliosa* Pursh. Many careful and reliable taxonomists have failed to note the obvious differences between *R. ciliosa*, as we have ordinarily identified it, and the original description by Pursh. As pointed out by Fernald (1945), the name *R. ciliosa* Pursh should be retained for a plant of the southeastern states and the Gulf Coast regions.

Ruellia strepens L. Sp. Pl. 634 (1753); Schneck (1876) 546; Patterson (1876) 29; Brendel (1887) 55; Gates (1926) 230; Pepon (1927) 471; McDougall & Liebttag (1928) 231; Stover (1930) 25; McDougall (1936) 316; Jones (1942) 72; Fuller (1943) 98; Fernald (1945) 16; Jones (1945) 234.

Dipteracanthus strepens (L.) Nees in Linnaea 16: 292 (1842); Lapham (1857) 526; Forbes (1870) 318.

Hygrophila illinoensis Wood ex. A. Gray, Syn. Fl. N. Am. 2: 327 (1878), erroneously assigned to Bull. Torr. Club 5: 41 (1874).

Ruellia strepens var. *cleistantha* A. Gray, Syn. Fl. N. Am. 1: 327 (1878).

Ruellia strepens f. *cleistantha* (A. Gray) S. McCoy in Am. Bot. 43: 24 (1937).

Type locality: "Habitat in Virginia, Carolina."

Range: Common in alluvial soil throughout Illinois, and from Pennsylvania to Iowa and south to Texas and Florida; flowering in Illinois from June to August.

Scott McCoy's paper (Am. Bot. 43: 24, 1937) gives an interesting account of observations from a specimen of *Ruellia strepens* transplanted to his garden. In June the plant bore flowers typical of the species and in autumn produced cleistogamous flowers.

Three specimens examined by the writer revealed that those collected from mid-August to November bore capsules closely packed in the axils of the upper leaves.

Adams County: Moist alluvial soil, eight miles south of Quincy, 8 September 1943, G. D. Fuller 3005.

Calhoun County: Along roadway through timber, Pere Marquette Study

Area, 11 October 1939, G. H. Boewe. Steep talus below Kampsville, 30 May 1933, Pepon & Barrett 4399.

Champaign County: Sangamon River 15 miles west of Urbana, 21 June 1942, N. R. Piesbergen. University Woods near Urbana, 18 October 1941, G. N. Jones 15008. Roadside, Urbana, 6 July 1928, W. B. McDougall 52. Woods, Urbana, 17 June 1880, Seymour & Butts. Thicket, "St. Joe to Sidney," 16 September 1889, G. P. Clinton. Woods along Salt Fork River, near Urbana, 3 October 1943, G. N. Jones 16316. Near Urbana, 19 June 1941, G. N. Jones 13909. Grassy roadside, near Urbana, 28 June 1940, G. N. Jones 11818. Sangamon River bottoms near Mahomet, 29 September 1940, G. N. Jones 13120.

Fulton County: Sandy ground, Liverpool, 6 August 1891, H. S. Pepon.

Hancock County: Crooked Creek bottom, 10 September 1916, F. C. Gates.

Kankakee County: Rich soil, 2 June 1872, E. J. Hill.

Livingston County: Moist woods, five miles south of Pontiac, 26 July 1944, G. D. Fuller 9196.

Macoupin County: Carlinville, 19 June 1882, C. Robertson 2277. Carlinville, 19 August 1889, W. E. Andrews. Carlinville, 19 June 1889, W. E. Andrews.

Macon County: Decatur, May 1896, I. W. Clokey. Three miles east of Decatur, cleared hill top, 30 May 1915, I. W. Clokey 2486.

Menard County: Moist ravine, New Salem, 10 September 1940, G. D. Fuller 3015.

Peoria County: Peoria, dry open woods, July 1892, F. E. McDonald. Rich woods, Peoria, July 1901, F. E. McDonald. Low grounds, Peoria, July 1887, F. E. McDonald. (Without number or date) Peoria, F. Brendel as *Dipteracanthus strepens*.

Pike County: East Hannibal, 3 June 1913, J. Davis 4623.

Pulaski County: Swampy ground one mile north of Ullin, 5 June 1941, G. H. Boewe.

Richland County: Near Olney. "Birdhaven," 8 October 1920, R. Ridgway 1320.

Sangamon County: Rich soil, Salisbury Township, 18 August 1941, G. D. Fuller 6537.

St. Clair County: Mascoutah (without number or date) W. Welch as *Dipteracanthus strepens*.

Union County: Rich soil, woods, 25 September 1940, G. D. Fuller 334.

Wabash County: In cut-over wooded area about one mile north of Bellmont,

29 May 1941, G. H. Boewe. Crawfish Bridge, 4 July 1893, J. Schneck. Gleck's field, 8 June 1878, J. Schneck. Mt. Carmel; a specimen in which the "flower is a deeper red and has a smaller flower, especially in the expanded portion, than the regular form." July 1880, J. Schneck.

Ruellia pedunculata Torr. ex. A. Gray, Syn. Fl. N. Am. 2: 325 (1878). Britton and Brown (1913) 3: 242; McDougall (1936) 316; Fuller (1943) 98; Jones (1945) 234.

Type locality: "Dry woods in W. Louisiana, J. Hale. Arkansas, Bigelow, Mrs. Harris."

Range: In dry, open woods in southern Illinois to Oklahoma, eastern Texas and Louisiana. Flowering from June to August and commonly called the Stalked *Ruellia*.

Alexander County: Rich woods two and one-half miles south of Diswood, 27 September 1931, Pepon & Barrett 695.

Johnson County: Dry soil, Tunnel Hill, 26 May 1902, J. Schneck.

Pulaski County: In open woods on top of dry hill one and one-half miles northwest of Ullin, 18 June 1941, G. H. Boewe.

Saline County: On a rocky slope of Swartz Hill in northeast Saline County, 12 September 1931, Pepon & Foster 1405.

Union County: Anna, 13 August 1880, A. B. Seymour. In the shady wood edge, along roads, 13 June 1927, G. L. Stout 2271. In open woods one mile northeast of the city limit of Anna, 29 August 1931, J. Schopf 1557. Open woods back of peach orchard, one mile northeast of city limit of Anna, 29 August 1931, J. Schopf 1544.

Ruellia humilis Nutt. in Trans. Am. Phil. Soc. 5: 182 (1837).

Dipteracanthus ciliatus (Pursh) Nees in Linnaea 16: 294 (1842); Lapham (1857) 526; Forbes (1870) 318.

Dipteracanthus noctiflorus β *humilis* (Nutt.) Nees in DC. Prodr. 11: 123 (1847).

R. ciliosa, var. *longiflora* A. Gray, Syn. Fl. 2: 236 (1878).

R. ciliosa var. *humilis* (Nutt.) Britt. in Trans. N. Y. Acad. Sci. 9: 185 (1890).

R. ciliosa sensu Mead (1846) 119; Babcock (1872) 146; Patterson (1874) 11; Hyatt (1875) 67; Patterson (1876) 28; Schneck (1876) 546; Brendel (1887) 55; Higley & Raddin (1891) 90; Huett (1897) 112; Snare & Hicks (1898) 16; Gleason (1907) 187; Gleason (1910) 166; Thone (1925) 105; Pepon (1927) 471;

McDougall (1936) 316; Jones (1945) 234.—Not *R. ciliosa* Pursh (1814).

R. caroliniensis sensu Fuller (1943) 98. Non (Walt) Steud.

R. humilis var. *typica*, Fern. in Rhodora 47; 54 (1945).

R. humilis forma *grisea*, Fern. in l. c. 54.

R. humilis var. *frondosa*, Fern. in l. c. 54.

R. humilis var. *longiflora* (A. Gray). Fern. in l. c. 56.

R. humilis var. *expansa*, Fern. in l. c. 58.

Type locality: "Hab. On rocks in the upland forests and prairies." (Type or isotype, an Arkansas specimen from Nuttall in the Torrey Herbarium).

Range: In dry soil, along roads, on grassy banks, and dry slopes from southern Michigan to southeastern Nebraska, Iowa, and Missouri, and southward to eastern Texas, Louisiana, and northwestern Florida. Flowering in Illinois from June to September.

In this study the following characters have been used in order to separate the intergrading varieties and forms of this species: leaf shape, length of internode, kind and degree of pubescence, length and shape of sepals, and length of corolla. According to Nuttall's description of *R. humilis*, the plants are erect, hirsute, the leaves oblong-ovate, sessile, the peduncles 1-3-flowered, and the tube of the corolla twice the length of the lacinate, filiform calyx lobes. The leaves were indicated as "very similar to those of *R. strepens*, but sessile and not perfectly entire." The flowers were said to be pale blue and commonly two inches long. *Ruellia humilis* forma *grisea* Fern., with a more extreme pubescence than *R. humilis* var. *typica*, is scattered through the range of the latter. In *R. humilis* var. *longiflora* (A. Gray) Fern. the corolla is indicated as five to eight centimeters long, the veins and the margins of the leaves copiously villous-hirsute. *R. humilis* var. *expansa* Fern. has leaves described as ovate to ovate-oblong. They vary somewhat in size but agree in degree of pubescence.

Cass County: Sandy soil at edge of timber, five and one-half miles south of Beardstown, 27 June 1941, G. H. Boewe.

Champaign County: Urbana, 15 July 1878, A. B. Seymour. Urbana, 13 July 1880, A. B. Seymour. Urbana, 25 June 1897, G. P. Clinton. Grassy bank near Urbana, 1 August 1940, G. N. Jones 12686. Near Urbana, 20 July 1940, G.

N. Jones 12531. Near Urbana, 10 September 1939, G. N. Jones 10714. Near Urbana, 24 June 1942, N. R. Piesbergen. Grassy bank near Urbana, 1 July 1940, G. N. Jones 12250. One mile east of Mayview, 18 June 1942, G. H. Boewe. One-half mile northeast of Rantoul, 1 July 1942, G. H. Boewe.

Christian County: One and one-half miles northeast of Stonington, 24 June 1942, G. H. Boewe.

Cook County: Calumet, dry hills (without name), 12 July 1865. Sandy soil, Custer Park (without date), W. S. Moffatt 570. Dry rocky places, Lemont, 29 June 1898, A. Chase 877. Dry rocky ground, Lemont, 29 June 1898, E. J. Hill.

Cumberland County: Hazel Dell Area, July 1939, C. S. Spooner.

Douglas County: Arcola, 2 July 1939, C. Mohr.

Hancock County: Prairie along Wabash R. R., 11 September 1916, F. C. Gates.

Henderson County: Sandy, open places, 27 May 1932, Pepoon & Barrett.

Jasper County: East of Wheeler, 9 June 1941, G. H. Boewe.

Jefferson County: Southeast of Centralia, 25 July 1930, L. Campbell & C. Alexopoulos.

Kankakee County: Three miles northwest of Bonfield, 18 July 1943, G. N. Jones 15942. Sandy swales, 11 June 1932, H. S. Pepoon 2258.

Macon County: Stevens Creek at Wabash, openings in timber, 1 July 1915, I. W. Clokey 2429.

Macoupin County: Carlinville, 21 June 1889, W. E. Andrews. Carlinville, moist soil in partial shade, 13 July 1940, G. D. Fuller 2249.

Mason County: Havana, 13 June 1894, T. J. Burrill. Havana, 27 June 1910, F. C. Gates 3471. 25 June 1942, G. H. Boewe. Havana, low, sandy forest, 12 July 1940, G. D. Fuller 2231.

Morgan County: Near Manchester, 30 May 1932, Pepoon & Barrett.

Ogle County: Oregon, "Liberty Hill," dry soil, 7 August 1883, M. Waite. Byron, dry hillsides, 17 August 1895, W. S. Moffatt 455. Oregon, rocky banks, 18 August 1895, W. S. Moffatt 455. Open woods White Pines State Park, 8 July 1942, G. D. Fuller 3435-0.

Peoria County: Peoria, dry prairies, July (date incomplete) F. E. McDonald.

Pike County: Along a steep wooded creek bank, 1 July 1943, G. H. Boewe. Roadside east of El Dara, 22 June 1931, L. R. Tehon.

Pope County: Rocky dry wooded hillside northeast of Golconda, 19 June 1941,

G. H. Boewe. Growing in oak-elm woods, 3 July 1931, J. Schopf 348.

Shelby County: Roadside two miles east of Windsor, 25 June 1940, G. H. Boewe. Two miles east of Tower Hill, 24 June 1941, G. H. Boewe.

Stark County: Gravel slope near Wady Petra, 9 July 1900, V. H. Chase 673.

Tazewell County: Sunny, sandy banks south of Pekin, 17 July 1932, Pepon & Barrett.

Union County: Cobden, 25 July 1886, F. S. Earle. Pine Hill, rocky, shaded hillside, 11 September 1940, G. D. Fuller 266.

Vermilion County: Along Vermilion River between Oakwood and Collison, 23 June 1940, G. N. Jones 11620.

Wabash County: Dry, hard soil, 20 June 1902, J. Schneck.

Winnebago County: Above Rockford, 23 June 1933, H. S. Pepon.

SUMMARY

A study has been made of the genera and species of Acanthaceae occurring in Illinois, and keys have been provided for their identification. A county distribution of the species is included.

Only one species of *Dianthera*, *D. americana*, is known to occur in Illinois. *Justicia humilis* Michx. Fl. Bor. Am. 1: 8 (1803), was reported from southern Illinois by E. J. Palmer (1921) 134 as *Dianthera ovata* Walt. However, there appear to be no Illinois specimens in the herbarium of the Missouri Botanical Garden, where Palmer deposited his specimens, to substantiate this report. Three species of *Ruellia*, *R. strepens*, *R. pedunculata*, and *R. humilis*, are discussed, with supporting citations of Illinois specimens.

Ruellia ciliosa Pursh is a plant of the southeastern and Gulf-coastal regions. The writer follows M. L. Fernald in substituting the name *R. humilis* Nutt. for the northern-ranging species commonly found in

Illinois, and formerly incorrectly known as *R. ciliosa* Pursh.

REFERENCES

- BABCOCK, H. H. 1872. The Flora of Chicago and Vicinity. The Lens 1: 144-150.
- BRENDEL, F. 1887. Flora Peoriana. 89 pp. Peoria, Illinois.
- BRITTON, N. L., AND A. BROWN. 1913. An Illustrated Flora of the Northern United States, Canada, and the British Possessions. Ed. 2. 3 vols. New York Botanical Garden, N. Y.
- FERNALD, M. L. 1945. *Ruellia* in the Eastern United States. *Rhodora* 47: 1-38; 47-63; 69-90.
- FORBES, S. A. 1870. Botanical Notes. Am. Bot. & Ent. 2: 318.
- FULLER, G. D. 1943. A Preliminary Check list of the Vascular Plants of Sangamon Co., Illinois. Trans. Ill. Acad. Sci. 36: 91-99.
- GATES, F. C. 1926. Contributions to the Flora of Hancock County, Illinois. Trans. Ill. Acad. Sci. 18: 225-234.
- GLEASON, H. A. 1910. The Vegetation of the Inland Sand Deposits of Illinois. Bull. Ill. State Lab. Nat. Hist. 9: 23-174.
- GRAY, A. 1878. Synoptical Flora of North America. 2^d: 325-327.
- HIGLEY, W. K., AND C. S. RADDIN. 1891. The Flora of Cook County, Illinois, and a Part of Lake County, Indiana. Bull. Chi. Acad. Sci. 2: 1-168.
- HUETT, J. W. 1897. An Essay Toward a Natural History of LaSalle County, Illinois. Part I—Botany. Flora LaSallensis. 136 pp. Fair-Dealer Print, Ottawa, Illinois.
- HYATT, J. 1875. Western Plants Observed Near Chicago and Peoria. Bull. Torr. Club 6: 66-68.
- JONES, G. N. 1942. A Checklist of the Vascular Plants of the University of Illinois Woodlands. Trans. Ill. Acad. Sci. 35: 71-72.
- 1945. Flora of Illinois. 317 pp. The University Press. Notre Dame, Indiana.
- LAPHAM, I. A. 1857. Catalogue of the Plants of the State of Illinois. Trans. Ill. State Agr. Soc. 2: 492-550.
- MCCOY, S. 1937. American Botanist. 43: 22-24.
- MCDUGALL, W. B., AND CHARLOTTE LIEBTAG. 1928. Symbiosis in a Deciduous Forest. 3. Bot. Gaz. 86: 226-234.
- MCDUGALL, W. B. 1936. Fieldbook of Illinois Wild Flowers. 406 pp. Ill. Nat. Hist. Surv. Man. I. Urbana, Illinois.

- MEAD, S. B. 1846. Catalogue of Plants Growing Spontaneously in the State of Illinois, the Principal Part near Augusta, Hancock County. *Prairie Farmer* 6: 93; 119-122.
- NUTTALL, T. 1818. The Genera of N. A. Plants. Vol. 2: 44. Philadelphia, Pennsylvania.
- 1837. Transactions of the American Philosophical Society. Vol. 5: 182-183.
- PALMER, E. J. 1921. Botanical Reconnaissance of Southern Illinois. *Journ. Arnold Arb.* 2: 129-153.
- PATTERSON, H. N. 1874. Plants Collected in the Vicinity of Oquawka, Henderson County. 18 pp. Oquawka, Illinois.
- 1876. Catalogue of the Phaenogamous and Vascular Cryptogamous Plants of Illinois, Native and Introduced. 54 pp. Spectator Print, Oquawka, Illinois.
- PEPOON, H. S. 1927. An Annotated Flora of the Chicago Area. *Chicago Acad. Sci.* 8: 1-554.
- SCHNECK, J. 1876. Catalogue of the Flora of the Wabash Valley Below the Mouth of White River. *Geol. Surv. Ind. Ann. Rept.* 7 (1875): 504-579.
- STOVER, E. L. 1930. A Mesophytic Ravine, Rocky Branch. *Teachers' Coll. Bull. of the Eastern Ill. State Teachers' Coll., Charleston, No. 110:* 1-26.
- THONE, F. 1925. Preliminary Check List of the Vascular Plants of Illinois State Park at Starved Rock, LaSalle County. *Trans. Ill. Acad. Sci.* 17: 100-106.

CHEMISTRY

H. E. PHIPPS, *Chairman*

Eastern Illinois State Teachers College, Charleston

- * 1. Petroleum, Natural Gas, and Agriculture: GUSTAV EGLOFF, Universal Oil Products Company, Chicago.
- * 2. Catalysis in the Oxidation of Oxalic Acid by Nitric Acid: J. H. REEDY, University of Illinois, Urbana.
- * 3. Research Projects for Senior Chemistry Students: SISTER MARY MARTINETTE, B.V.M., Mundelein College, Chicago.
- * 4. A Bomb in a Test-tube: G. FREDERICK SMITH, University of Illinois, Urbana. (slides)
- * 5. Electron Microscope in Analytical Chemistry: ROBERT B. FISCHER, University of Illinois, Urbana. (slides)
- * 6. Nutritional Studies on the Yeast, *Schizosaccharomyces pombe*: FRANK M. CLARK, University of Illinois, Urbana.
7. Chemistry of Synthetic Rubber: RUDOLPH DEANIN, University of Illinois, Urbana. (slides)
8. The Use of Partial Differentials for the Estimation of Errors in Volumetric Analysis: F. WM. CAGLE, JR., University of Illinois, Urbana.

*Not published.