

CONTRIBUTIONS TO AN ILLINOIS FLORA NO. 2 COMPOSITAE I. (TRIBE VERNONIFAE)

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ABSTRACT.—Seven taxa of *Vernonia* and one of *Elephantopus* are recorded from Illinois. Keys, descriptions, and distributional maps are provided for each taxon.

The tribe Vernoneae is composed of perennials with alternate leaves. The flowers are tubular, perfect, and purple (rarely pink or white). The style branches are filiform, acute or acuminate, and hispidulous. The anthers are distinctly sagittate. The pappus is composed of capillary bristles or scale-like bristles or both.

The tribe is represented in Illinois by two genera, *Vernonia* and *Elephantopus*. *Vernonia* comprises a genus of about 500 species widely distributed in all tropical areas and extending into temperate regions in North and South America, being most numerous in tropical America. The Illinois flora contains five species of *Vernonia*, one of which may now be extinct in the state. *Elephantopus* is composed of about 18 species distributed in the tropical and warm regions in both hemispheres, with a single species occurring in Illinois.

SYSTEMATIC TREATMENT

Key to the Illinois Genera of Vernoneae

1. Pappus double, the inner of rough capillary bristles, the outer of scales or short bristles; heads not glomerate1. *Vernonia*
1. Pappus a single series of bristles; heads glomerate, subtended by sessile bracts2. *Elephantopus*
1. VERNONIA Schreb. Gen. Pl. 2:541. 1791.

Suprago Gaertn. Fruct. 2:402. 1791.

Baccharoides Moench. Meth. 578. 1794.

Ascaricida Cass. Dict. Sci. Nat. 3: suppl. 38. 1816.

Lepidaploa Cass. Bull. Soc. Philom. 1817:66. 1817.

Achyrocoma Cass. Dict. Sci. Nat. 26:61. 1823.

Senecioides Post & Kuntze, Lex. Gen. Phan. 2:515. 1823.

Erect perennial herbs; stems leafy, branching, glabrous or pubescent; leaves alternate, simple; inflorescence corymbiform; heads discoid, 13-to many-flowered, ebracteate; involucre subcylindrical to hemispheric, urceolate; phyllaries imbricate, inner progressively longer, persistent, spreading at maturity; receptacle flat to subconvex; corolla regular, 5-cleft, purple (rarely pink or white); anthers sagittate, syngonesious; style-branches gradually attenuate, minutely hispidulous outside; pappus double, outer of short capillary or scale-like bristles, inner of longer capillary bristles; achene ribbed, pubescent or glabrous, usually resinous.

Key to the Illinois Species of *Vernonia*

1. Phyllary tips long-filiform; heads 12-20 mm wide.....1. *V. crinita*
1. Phyllary tips obtuse to abruptly acuminate; heads 4-12 mm wide.
 2. Leaves tomentose to tomentellous beneath.
 3. Phyllary tips obtuse to mucronate, erect or slightly spreading ...2. *V. missurica*
 3. Phyllary tips abruptly acuminate, squarrose...3. *V. baldwinii*
 2. Leaves glabrous or scabrous-hirtellous beneath (sometimes tomentellous on veins).
 4. Leaves glabrous, conspicuously punctate beneath; outer pappus of short capillary bristles4. *V. fasciculata*
 4. Leaves scabrous-hirtellous, scarcely punctate beneath; outer pappus of scale-like bristles5. *V. altissima*
1. VERNONIA CRINITA Raf. New Fl. 4:77. 1838.
- Vernonia arkansana* DC. Prodr. 7:264. 1838.

Cacalia arkansana (DC.) Kuntze, Rev. Gen. 969. 1891.

Erect perennial herbs; stems 1-3 m tall, simple or sparingly branched, leafy, glabrous or minutely puberulent; leaves linear to linear-lanceolate, 8-18 cm long, 5-20 mm wide, acuminate, tapering to base, entire or finely serrulate-denticulate, thin, glabrous above, glabrous or sparsely pubescent and impressed-unctate beneath; inflorescence irregular, with 5-40 heads; peduncles stout, thickened above, 1-5 cm long; heads 55-to-90 flowered; flowers purple; involucre 10-18 mm high; phyllary tips long-filiform, erect or spreading, glabrous or pubescent; pappus purple to brown, inner bristles 6-7 mm long, outer similar, but shorter; achenes 5-6 mm long, strongly ribbed, glabrous or subglabrous, usually resinous in furrows; $n=17$.

Vernonia crinita is found in open woods and prairies from Missouri to Kansas, Oklahoma, and Arkansas, being adventive in Ohio and Illinois. It is known to have occurred in Illinois at a single locality in Champaign County which has since been destroyed by a construction project: At edge of road west of Champaign about a quarter of a mile south of the Champaign Airport, August 3, 1955, *Slimmer 111* (ILL); September 18, 1955, *Jones 20598* (ILL); September 12, 1957, *Winterringer 13829*, 13830 (ISM); September 30, 1958, *Winterringer 14851* (ISM). (Fig. 1).

2. *VERNONIA MISSURICA* Raf. Herb Raf. 28. 1841.

Key to the Illinois Forms of
Vernonia missurica

- 1. Flowers purple 2a. *f. missurica*
- 1. Flowers rose or white.
 - 2. Flowers rose 2b. *f. carnea*
 - 2. Flowers white ... 2c. *f. swinkii*

2a. *VERNONIA MISSURICA* Raf. f. MISSURICA

Vernonia fasciculata Michx. var. β T. & G. Fl. N. Am. 2:58. 1841.

Vernonia altissima Nutt. var. *grandiflora* A. Gray, Syn. Fl. N. Am. 1:90. 1884.

Vernonia drummondii Shuttlew. in Werner, Jour. Cinc. Soc. Nat. Hist. 16:171. 1894.

Vernonia inferior Small var. *drummondii* (Shuttlew.) Mack. & Bush, Man. Fl. Jackson Co. 190. 1902.

Vernonia illinoensis Gleason, Bull. N. Y. Bot. Gard. 4:211. 1906.

Vernonia reedii Daniels, Univ. Mo. Stud. Sci. 1:364. 1907.

Vernonia michiganensis Daniels, Univ. Mo. Stud. Sci. 1:402. 1907.

Vernonia missurica Raf. var. *austro-riparia* Gleason, Bull. Torrey Club 46:245. 1919.

Erect perennial herbs; stems 1.0-1.5 m tall, branched above, leafy, tomentellous; leaves lanceolate to ovate-lanceolate, 6-15 cm long, 1.5-6.0 cm wide, long-acuminate, acute to rounded at base, subentire to sharply serrate, firm, scabrellate above, thinly to densely tomentose beneath; inflorescence open, flattened or concave, 1-5 cm wide; heads 34-to 55-flowered; flowers purple; involucre broadly campanulate, short-cylindrical to hemispherical, 6-8 mm high; phyllary tips rounded to mucronate, appressed, imbricate, purple or greenish along the midvein, glabrous or puberulent and resinous on the back, entire or arachnoid-ciliolate; pappus tawny to purple, inner bristles 6-8 mm long, outer bristles broader and short-

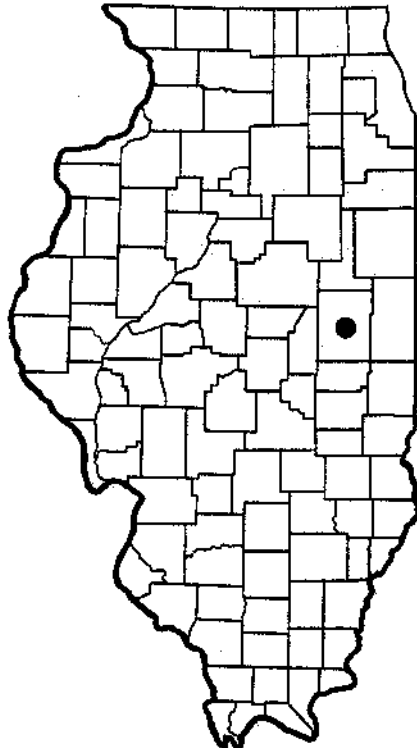


FIGURE 1. Distribution of *Vernonia crinita* in Illinois.

er; achenes 4.0-4.5 mm long, subglabrous to puberulent on ribs, resinous in furrows; $n = 17$.

Vernonia missurica f. *missurica* is found in open woods and prairies from Ontario to Iowa, south to New Mexico, and east to Alabama. It is common throughout Illinois (Fig. 2). It exhibits considerable variation, primarily in leaf pubescence and the inflorescence. The species tends to approach *V. altissima* by the presence of short, conical, multicellular hairs on the lower leaf surface and in the more loose inflorescence with smaller heads. A number of taxa have been named from local races within the species as is noted by the extensive synonymy. *Vernonia illinoensis* has been considered by some as a hybrid between *V. missurica* and *V. altissima* and even to some extent to be derived from *V. baldwinii* and *V. fasciculata*. The author regards these individuals so assigned to be variations

within the species and, therefore, places them in synonymy under *V. missurica*.

2b. *VERNONIA MISSURICA* Raf. f. *CARNEA* Standley, *Rhodora* 32:33. 1930.

This form differs from *V. missurica* f. *missurica* in having its flowers rose-colored rather than purple.

It is known only from one collection in Illinois: PEORIA CO.: Chase 3266 (ILL.) (Fig. 3).

2c. *VERNONIA MISSURICA* Raf. f. *SWINKII* Steyermark, *Rhodora* 59:24. 1957.

This form differs from *V. missurica* f. *missurica* in having its flowers white rather than purple.

It is known only from the type locality and from one collection in Illinois: COOK CO.: Prairie south of 95th Street and west of US 45 in Argonne Forest Preserve south of Willow Springs, Swink 2775 (F.) (Fig. 4).

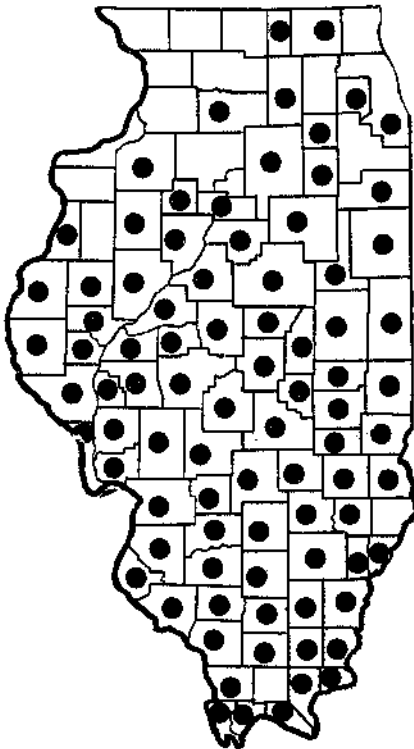


FIGURE 2. Distribution of *Vernonia missurica* f. *missurica* in Illinois.

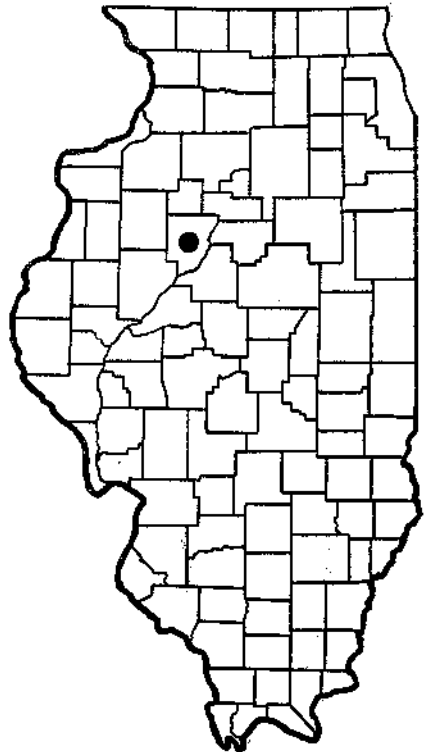


FIGURE 3. Distribution of *Vernonia missurica* f. *carnea* in Illinois.

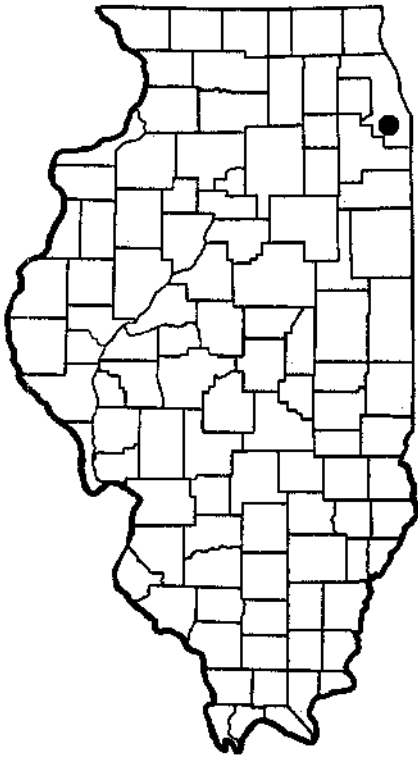


FIGURE 4. Distribution of *Vernonia missurica* f. *swinkii* in Illinois.

3. **VERNONIA BALDWINII** Torr. Ann Lyc. N. Y. 2:211. 1827.
Vernonia sphaeroidea Nutt. Trans. Am. Phil. Soc. II 7:283. 1840.
Cacalia gigantea Kuntze var. *baldwinii* (Torr.) Kuntze, Rev. Gen. 324. 1891.
Cacalia baldwinii (Torr.) Kuntze, Rev. Gen. 969. 1891.
Vernonia interior Small, Bull. Torrey Club 27:279. 1900.
Vernonia interior Small var. *baldwinii* (Torr.) Mack. & Bush, Man. Fl. Jackson Co. 190. 1902.
Vernonia duggariana Daniels, Univ. Mo. Stud. Sci. 1:360. 1907.
Vernonia flavipapposa Daniels, Univ. Mo. Stud. Sci. 1:360. 1907.
Vernonia parthenioides Daniels, Univ. Mo. Stud. Sci. 1:360. 1907.
Vernonia prealtu Daniels, Univ. Mo. Stud. Sci. 1:362. 1907.
Vernonia pseudobaldwinii Daniels, Univ. Mo. Stud. Sci. 1:363. 1907.
Vernonia baldwinii Torr. var. *interior* (Small) Schubert, Rhodora 38:370. 1936.

Erect perennial herbs; stems 0.5-1.5 m tall, branched above, leafy, tomentellous to tomentose; leaves lanceolate to ovate-lanceolate, 8-15 cm long, 2.5-5.0 cm wide, acuminate, narrowed to acute base, sharply serrate, firm, puberulent above, tomentellous and resinous-dotted beneath; inflorescence open, irregular, 1-2 dm wide; heads 18 to 35-flowered; flowers purple; involucre campanulate to thick-cylindrical, 5-7 mm high; phyllary tips acuminate, squarrose or reflexed, appressed, imbricate, green with purple margin, puberulent and resinous on back, arachnoid-ciliate; pappus tawny to light purple, inner bristles 6 mm long, outer bristles broader and shorter; achenes 3 mm long, puberulent, resinous in furrows; *n* = 17.

Vernonia baldwinii is found in prairies and open ground from Illinois to Oklahoma to Arkansas. It is local in the southern two-thirds of Illinois (Fig. 5). This species also exhibits consider-

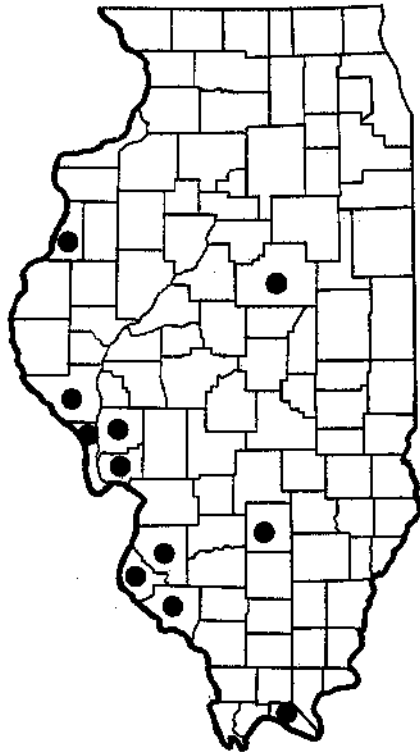


FIGURE 5. Distribution of *Vernonia baldwinii* in Illinois.

able variation. The five species named by Daniels are local races of the species and do not maintain themselves, forming a cline from one taxon to another. They are, therefore, placed in synonymy by this author.

4. *VERNONIA FASCICULATA* Michx.
Fl. Bor. Am. 2:94. 1803.

Cacalia fasciculata (Michx.) Kuntze,
Rev. Gen. 970. 1891.

Vernonia fasciculata Michx. var. *nebraskensis* Gleason, Bull. Torrey Club 46:247. 1919.

Erect perennial herbs; stems 0.5-2.0 m tall, branched above, leafy, glabrous, often purple; leaves linear-lanceolate to oblong-lanceolate, 8-15 cm long, 0.5-3.0 cm wide, long-acuminate to acute, narrowed to base, denticulate to sharply serrate, glabrous above, glabrous or minutely puberulent beneath; inflorescence dense, hemispherical or flattened, 4-10 cm wide; heads crowded, sessile or short-peduncled, 18- to 21-flowered; flowers purple; involucre narrowly campanulate to subcylindrical, 6 mm high; phyllary tips rounded to subacute, appressed, imbricate, glabrous or puberulent, sparsely ciliate; pappus tawny to purple, inner bristles 7-8 mm long, outer bristles similar but shorter; achenes 3 mm long, puberulent on ribs, resinous in furrows; $n = 17$.

Vernonia fasciculata is found in rich low ground and prairies from Ohio to North Dakota, south to Oklahoma. It is distributed nearly throughout Illinois (Fig. 6).

5. *VERNONIA ALTISSIMA* Nutt. Gen.
2:134. 1818.

Vernonia albiflora Raf. Herb. Raf. 29.
1833.

Vernonia fasciculata Michx. var. γ T.
G. Fl. N. Am. 2:58. 1841.

Vernonia fasciculata Michx. var. δ T.
& G. Fl. N. Am. 2:58. 1841.

Vernonia gigantea Britton, Bull. Torrey
Club 20:485. 1893 (in part).

Vernonia maxima Small, Bull. Torrey
Club 27:280. 1900.

Vernonia gigantea Britton var. *pubescens*
Morris, Proc. Biol. Soc. Wash.
13:179. 1900.

Vernonia maxima Small var. *pubescens*
Morris, in Britton, Man. 919. 1901.

Vernonia altissima Nutt. var. *pubescens*
(Morris) Daniels, Univ. Mo. Stud.
Sci. 1:402. 1907.

Vernonia altissima Nutt. var. *taeniotricha*
Blake, Rhodora 19:167. 1917.

Vernonia altissima Nutt. var. *brevipappi*
Gleason, Bull. Torrey Club 46:248.
1919.

Vernonia altissima Nutt. var. *laxa*
Gleason, Bull. Torrey Club 46:248.
1919.

Erect perennial herbs; stems 1-3 m tall, branched above, leafy, glabrous or subglabrous; leaves lanceolate to ovate-lanceolate, 15-25 cm long, 3-8 cm wide, long-acuminate, gradually attenuate to base, subentire to sharply and irregularly serrate, thin, glabrous or subglabrous above, pubescence on lower surface of short, straight, conic hairs, sometimes tomentellous along veins; inflorescence flattened or concave, 1-5 dm wide, open; heads (13-) 20- to 30-flowered; flowers purple; involucre campanulate, 4-6 mm high; phyllary tips rounded, rarely apiculate, appressed, imbricate, glabrous or puberulent, entire or sparsely ciliate; pappus tawny to purple, inner bristles 5-7 mm long, outer bristles broader and shorter; achenes 3 mm long, puberulent, rarely sparsely resinous in furrows; $n = 17$.

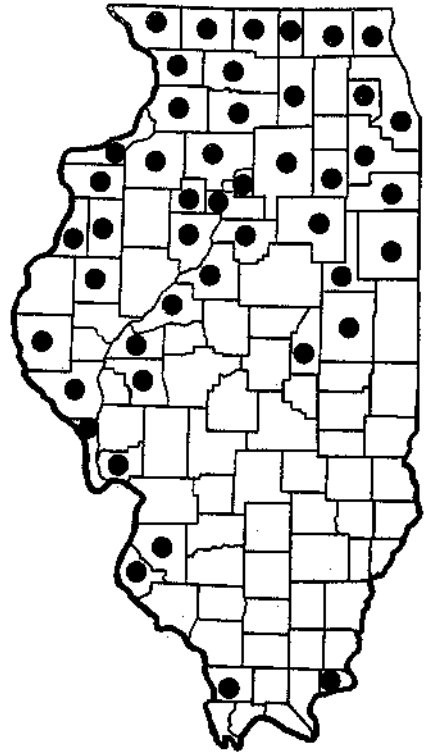


FIGURE 6. Distribution of *Vernonia fasciculata* in Illinois.

Vernonia altissima is found in low rich ground and open woods from New York, west to Missouri, south to Louisiana, and east to Georgia. It is frequent throughout Illinois (Fig. 7). Variation in *V. altissima* is also great. Pubescence of the lower leaf surface is primarily that of short, conic hairs, but long, multicellular hairs may be found in various degrees on the midrib and veins. Also the head size is variable and the inflorescence, normally open, will in some specimens tend to be compact. This has been suggested by some to be due to hybridization with *V. missurica* f. *missurica*, but the author considers this just variation within the species.

2. ELEPHANTOPUS L. Sp. Pl. 814. 1753.

Erect perennial herbs; stems leafy or scapiform, branching, pubescent; leaves alternate, simple; inflorescence corymbose; heads discoid, 1- to several-

flowered, subtended by sessile, triangular-ovate bracts; involucre urceolate, composed of 8 bracts, outer 4 shorter than inner 4; receptacle flat or nearly so; corolla unequally 5-cleft, blue; anthers sagittate, syngonesious; style-branches attenuate, minutely hispidulous outside; pappus of 5-8 short, flattened scales prolonged at the summit (in our species) into straight terminal bristles; achenes 10-ribbed.

Elephantopus is represented in Illinois by the following single species.

1. ELEPHANTOPUS CAROLINIANUS Willd. Sp. Pl. 3:2390. 1804.

Elephantopus violaceus Schultz-Bip. Linnæa 20:517. 1804.

Erect perennial herbs; stems 2-8 dm tall, branched in upper half, leafy, densely hirsute below, pilose or becoming glabrate above; leaves elliptic to obovate, 10-20 cm long, 3-10 cm wide, subacute to obtuse, abruptly narrowed or tapering to a winged petiole, crenate,

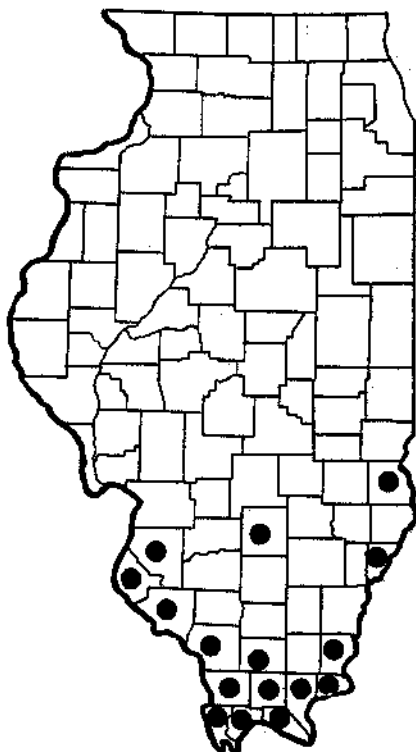
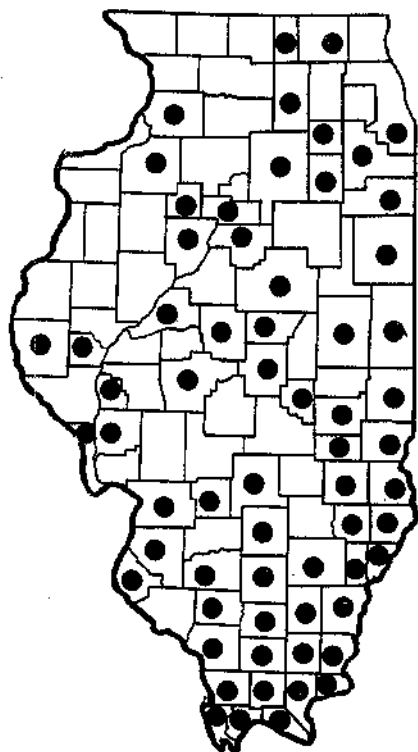


FIGURE 7. Distribution of *Vernonia altissima* in Illinois.

FIGURE 8. Distribution of *Elephantopus carolinianus* in Illinois.

papillose-pilosulous to subglabrous above, resinous-dotted and pilosulous beneath; heads discoid, 1- to 5-flowered, in numerous glomerules, subtended by sessile, triangular-ovate, foliaceous bracts; flowers blue; involucre about 8 mm high, composed of 8 bracts, outer 4 shorter than inner 4; phyllaries acuminate, thinly strigose and resinous, green with hyaline margins; pappus composed of 5-8 capillary bristles, 6 mm long, dilated at base, purplish; achenes 4 mm long, hispid; $n = 11$.

Elephantopus carolinianus is found in dry woods from New Jersey to Kansas, south to Texas, east to Florida, and

also in Cuba and Puerto Rico. It is frequent in the southern third of Illinois (Fig. 8).

ACKNOWLEDGMENTS

The distributional maps are based on specimens examined from the herbarium of Eastern Illinois University, the Field Museum of Natural History, the Illinois Natural History Survey, the Illinois State Museum, the Missouri Botanical Garden, Southern Illinois University, the University of Illinois, and Western Illinois University.

Manuscript received June 28, 1967.