

## THE GENUS *GERARDIA* IN TENNESSEE

HAROLD ROBINSON<sup>1</sup>

Since the treatments of F. W. Pennell (1928-29, 1935) no work covering the genus *Gerardia* in Tennessee has appeared. The exclusion of certain southern species from recent manuals and the recent recognition of additional species in Tennessee have accentuated the need for a review of the genus in the state.

This study was undertaken as part of a thesis problem at the University of Tennessee. The helpful suggestions of numerous individuals are appreciated and especially those of Dr. A. J. Sharp under whose supervision the work was done. The cooperation of the curators of the herbaria from which specimens were borrowed I gratefully acknowledge and particularly of Dr. J. M. Shaver whose collection of Scrophulariaceae is now at the University of Tennessee..

Due to the large number of specimens examined, only one record of a species from each county has been cited. The herbaria and references from which county records were obtained have been designated as follows, using the abbreviations recommended by Lanjouw and Stafleu (1956) where possible: Frick 1955 (F.), Lincoln Memorial University (LMU), New York Botanical Garden (NY), Pennell 1928-29, 1935 (P), University of Tennessee (TENN) and Vanderbilt University (VDB). In addition to those cited, specimens were obtained from the Academy of Natural Sciences of Philadelphia for purposes of comparison.

The validity of the generic name has been discussed recently by St. John (1957) with the recognition of *Gerardia purpurea* L. as the lectotype and the reduction of the name *Agalinis* to synonymy. Still more recently DeWolf (1957) has stated that conservation of the name *Gerardia* Benth. is necessary. Whatever the outcome there appears to be general agreement that *Gerardia* should be the valid name and it seems unnecessarily confusing to revert to *Agalinis* here. As recognized here the genus *Gerardia* is limited to the narrow-leaved, primarily reddish-flowered forms, excluding *Aureolaria* and *Tomanthera*.

*Gerardia* L., Spec. Plant. (1753)

*Chytra* C. F. Gaertner, Fruct. et Semin. Plant. (1805). *Agalinis* Raf., New Fl. Amer. (1837). *Gerardia* Benth., in DC., Prod. Syst. Nat. Regn. Veg. (1846).

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Erect, usually branching, pubescent to glabrous, perennial or annual herbs, up to 8, or rarely 12 dm. tall, with leaves opposite or in a few species alternate, linear to filiform, entire; flowers in the axils of the upper leaves; pedicels nearly absent to 3 cm. long; sepals united basally forming a cup, free lobes long-tapering to nearly absent; corolla zygomorphic, tube campanulate, with five nearly equal, rounded lobes, spreading, or with posterior lobes arched, reddish-purple usually with purple or yellow marks, rarely nearly white, stamens four, anterior pair longer; capsule globose or subglobose, rarely obovoid or ellipsoid, mucronate, loculicidal, many-seeded.

### Key to Species

1. Pedicels uniformly about the length of the calyx or less, flowers usually borne two at a node in long racemes ----- 2.
2. Stems scabrescent to scabrous ----- 3.
3. Stems nearly glabrous to slightly scabrescent with very short, stiff hairs, especially on the angles of the stems (barely visible with a hand-lens) ----- e. *Gerardia purpurea*
3. Stems scabrous on all surfaces with many stiff hairs (easily seen with a hand-lens) ----- f. *Gerardia purpurea* var. *fasciculata*
2. Stems glabrous ----- g. *Gerardia purpurea* var. *racemulosa*
1. Pedicels regular or irregular in length, some or all much longer than the calyx, or flowers not paired at the nodes in long racemes ----- 4.
4. Calyx closely subtended by minute leaves; true pedicels all less than 1 cm. long; flowers rarely paired at nodes ----- b. *Gerardia gatesii*
4. Most mature pedicels more than 1 cm. long; flowers often paired at nodes ----- 5.
5. Inflorescence without or with only short racemose branches (4 nodes at most), most flowers single at a node and many appearing terminal on short lateral branches; stems scabrescent on the angles; plants yellowish-green ----- c. *Gerardia gattingeri*
5. Inflorescence with racemose branches more or less developed, if less either the stems not scabrescent on the angles or the plants brownish or blackened ----- 6.
6. Leaves subtending the flowers rarely as long as the pedicels; plants reddish-green to yellow ----- 7.
7. Stem smooth except for possible ridges on the sides; plants yellowish-green to yellow ----- a. *Gerardia decemloba*
7. Stems scabrescent or papillose ----- 8.
8. Stems papillose; plants with a reddish to violet tinge ----- d. *Gerardia pseudaphylla*
8. Stems scabrescent on the angles; plants yellowish-green to yellow ----- i. *Gerardia skinneriana*
6. Leaves subtending the flowers usually as long or longer than the pedicels, or plants brownish to blackened ----- 9.
9. Corolla with long hairs internally at the bases of the spreading upper lobes; leaves filiform ----- h. *Gerardia setacea*
9. Corolla without long hairs internally at the bases of the arched upper lobes; leaves filiform to 4 mm. broad ----- 10.
10. Calyx lobes less than 1 mm. long ----- j. *Gerardia tenuifolia*
10. Calyx lobes 1 mm. or more long ----- k. *Gerardia tenuifolia* var. *macrophylla*



a. *Gerardia decemloba* Greene, Pittonia (1899).

*Agalinis decemloba* (Greene) Pennell, Bull. Torrey Bot. Club (1913).

Erect, annual herbs with rather sparse, ascending branches; stem sharply four-angled, glabrous, usually light yellow-green; leaves opposite, main leaves 0.5-1.5 cm. long rarely up to 2.0 cm. long, straight or lower ones curved or bent; flowers borne in well-developed racemes or on short side-branches with minute, subtending bractlets; pedicels 2-2.8 mm. long; calyx 2-3 mm. long, lobes short to nearly obsolete and often callose; corolla 8-13 mm. long, with spreading lobes, internally long-pubescent at the bases of the posterior lobes, pale mallow-purple with two yellow lines and numerous purple spots anteriorly; capsule 3-5 mm. long, globose.

Distribution: On moist or dry, shaly or clayey soil in the Chesapeake Bay region, in central and western North Carolina, and in the Cumberland Plateau region of Tennessee and southeastern Kentucky extending southward into Alabama.

County records — COFFEE: *Shaver 8544* (TENN). CUMBERLAND: *Rock 914* (TENN). FENTRESS: *Rock 1012* (TENN). MARION: *Pennell 5709* (P). MORGAN: *Wherry and Pennell 13931* (P). RHEA: *Shanks, Woods and Cooley 14002* (TENN). ROANE: *Shanks, Woods and Cooley 13759* (TENN).

This species is very closely related to *G. obtusifolia* (*G. erecta* of Pennell in his earlier work and also, by error, *G. oblongifolia* in his later work) of the southeastern coastal plain. In *G. obtusifolia* the leaves are shorter and blunter, ending only slightly beyond the broadest part of the leaf. The leaves of *G. decemloba* have a longer, tapering apex. In addition Pennell (1935) states that the markings within the throat of the corolla are less distinct and the base of the capsule is more rounded in *G. obtusifolia*.

b. *Gerardia gatesii* (Benth.) Pennell, Mon. Acad. Nat. Sci. Phila. (1935).

(?) *Gerardia plukenetii* Elliott, Sketch Bot. S. Car. and Ga. (1824).

(?) *Agalinis plukenetii* (Ell.) Raf., New Fl. Amer. (1837).

*Gerardia filifolia gatesii* Benth., in DC., Prod. Syst. Nat. Regn. Veg. (1846).

Erect, annual herbs, up to 8 dm. tall, with numerous ascending branches; stem slightly scabrescent with small, stiff hairs, especially at the nodes of larger branches; leaves opposite, up to 2.5 cm. long; flowers borne few to a branch, those on short side-branches rarely appearing long-pedicelled being actually closely subtended by obscure, minute leaves; true pedicels 1 cm. long or less; calyx 3-4 mm. long, with lobes poorly developed; corolla 1.5-2.5 cm. long, with spreading lobes, internally long-pubescent at the bases of the posterior lobes, reddish-purple with two yellow lines and numerous purple spots anteriorly; capsule 3-6 mm. long, globose.

Distribution: In dry, open sandy pineland in Alabama and Georgia and closely adjacent regions with one collection from the southeasternmost county of Tennessee.

County record — POLK: *Wherry and Pennell 14011* (TENN).

This species is distinct from others in Tennessee by the combination of the lack of racemose branches and the presence of short pedicels. While it might be confused with *G. purpurea* it appears to be more closely related to *G. setacea*.

c. *Gerardia gattingeri* Small, Fl. Southeast. U. S. (1903).

*Gerardia tenuifolia leptophylla* Benth. and Hook., Compan. Bot. Mag. (1836).

*Gerardia tenuifolia filiformis* (Raf.) Benth., in DC., Prod. Syst. Nat. Regn. Veg. (1846).

*Gerardia tenuifolia asperula* A. Gray, Bot. Gaz. (1879).

*Gerardia asperula* (A. Gray) Small, l. c. (1903).

*Agalinis gattingeri* (Small) Small, in Britton and Brown, Ill. Fl. Northern U. S. and Can. ed. II. (1913).

Erect, annual herbs up to 8 dm. tall, with numerous ascending branches; stems scabrescent with minute stiff hairs, especially near the nodes, usually yellowish green; leaves opposite, up to 4.5 cm. long on the main stem, shorter on the branches; flowers borne on apical portions of main stem and main branches usually paired at nodes with shorter pedicels above and longer below, grading below into short flower-bearing branches with reduced, often minute leaves; pedicels 2-25mm. long; calyx 2-4 mm. long with lobes .5 mm. long; corolla 1-1.5 cm. long, with spreading lobes, internally long-pubescent at the bases of the posterior lobes, pink with two yellow lines and a few large purple spots anteriorly; capsule 3-5 mm. long, globose.

Distribution: In dry to moist, sandy, clayey or often rocky soil, in woodlands, barrens or on open bluffs. Geographically occurring in a broad band northward and southward in the Mississippi Valley. In Tennessee being scattered through most of the western part and east to the eastern edge of the Cumberland Plateau.

County records — CARROLL: *Pennell 20345* (P). COFFEE: *Ford and Russell 2166* (TENN). DAVIDSON: *Curtiss 1910* (Type) (NY). DICKSON: *Shaver 8542* (TENN). HAMILTON: *Pennell 5705* (P). LEWIS: *King 307* (VDB). McNAIRY: *Shanks, Woods and Cooley 14690* (TENN). RHEA: *Woods, Cooley and Shanks 8882* (TENN). ROANE: *Biltz. hb. 477h.* (P). RUTHERFORD: *DeSelm 936* (TENN). SCOTT: *Wherry and Pennell 13913* (TENN).

The key characters used by Pennell are not dependable for distinguishing *G. gattingeri* and *G. tenuifolia*. The presence of long racemose branches and the lack of long pubescence internally at the bases of the upper corolla lobes easily separates the latter.

d. *Gerardia pseudophylla* (Pennell) Pennell, Mon. Acad. Nat. Sci. Phila. (1935).

*Agalinis oligophylla pseudophylla* Pennell, Proc. Acad. Sci. Phila. (1929).

Erect, annual herbs up to 5 dm. tall, with rather densely, short branching to sparse, ascending branches; stems with sides strongly keeled and appearing eight-angled, with small whitish papillae on the sides, dull green or purplish; leaves opposite or slightly subopposite above, spreading below and more ascending above, up to 1 cm. long; flowers in racemes or on short side-branches; pedicels 2-25 mm. long; calyx 2-3 mm. long, lobes obscure, callose; corolla 12-14 mm. long, with spreading lobes, internally long-pubescent at the bases of the posterior lobes, purple with two yellow lines and a few large purple spots anteriorly; capsule 4 mm. long, globose.

Distribution: In moist soil, previously reported only from the longleaf-pine belt in eastern Louisiana and southern Mississippi and from the chalk prairie in the Cretaceous belt in western Alabama. Specimens have been observed from two localities in the Highland Rim region of middle Tennessee.

County records — COFFEE: *Shaver 8589* (TENN). DICKSON: *Shaver 8570* (TENN).

More southern specimens, identified by Pennell, differ in general aspect from the Tennessee material by the more developed short side-branches and the lack of a terminal racemose portion.

e. *Gerardia purpurea* L. Spec. Plant. (1753).

*Gerardia purpurea grandiflora* Benth., in Hook., Compan. Bot. Mag. (1836).

*Agalinis palustris* Raf., New Fl. Amer. (1837).

*Agalinis longifolia* Raf., l. c. (1837).

(?) *Agalinis corymbosa* Raf., l. c. (1837).

*Gerardia mesochora* Greene, Leaflets Bot. Obs. and Crit. (1910).



- Gerardia purpurea parvula* Pennell, Proc. Acad. Nat. Sci. Phila. (1911).  
*Agalinis purpurea* (L.) Pennell, Bull. Torrey Bot. Club (1913).  
*Agalinis fasciculata peninsularis* Pennell, in Proc. Acad. Nat. Sci. Phila. (1929).  
*Gerardia fasciculata peninsularis* (Pennell) Pennell, Mon. Acad. Nat. Sci. Phila. (1935).

Erect annual herbs, up to 12 dm. tall with usually long, ascending branches; stems minutely scabrescent to almost glabrous; leaves opposite, main leaves 2-4 cm. long; axillary fascicles often developed; flowers paired at the nodes in long racemes; pedicels 2-6 mm. long; calyx-cup 3-4 mm. long, lobes 1-3 mm. long; corolla 1-2.5 cm. long with spreading lobes internally long-pubescent at the bases of the posterior lobes, reddish-purple with two yellow lines and numerous purple spots anteriorly; capsules 5-7 mm. long, globose.

Distribution: In moist, usually sandy soil in open places over most of the eastern United States. In Tennessee, plants have been collected from all parts except the Central Basin and the Mississippi Flood Plains.

County records—BENTON: *Shanks, Cooley and Woods 13714* (TENN). BLEDSOE: *Shanks, Woods and Cooley 8946* (TENN). BLOUNT: *Sharp and Voloira 21544* (TENN). CLAIBORNE: *Frick (F)*. COCKE: *Frick (F)*. COFFEE: *Shaver 8580* (TENN). CUMBERLAND: *Shaver 8560* (TENN). DICKSON: *Shaver 8565* (TENN). HARDEMAN: *Shanks, Woods and Cooley 9233* (TENN). JEFFERSON: *Frick 421* (TENN). MADISON: *Bain 539* (P). MONTGOMERY: *F. Brown and A. Clebsch BB3822* (TENN). POLK: *Frick 340* (TENN). ROANE: *Wherry and Pennell 13978* (P). SEVIER: *Shaver 8534* (TENN). SCOTT: *Wherry and Pennell 13910* (P). UNION: *Frick (F)*.

This species is the most common of a group of closely related species. Of these *Gerardia maritima*, with rather blunt calyx lobes, appears to be the most distinct. In the north *G. paupercula* is distinguished by the calyx-lobes being half as long as the cup. In the south a number of species of limited distribution are usually recognized. Toward the south and east *G. purpurea* grades into the following varieties.

f. *Gerardia purpurea* var. **fasciculata** Elliott comb. nov.

- Gerardia fasciculata* Elliott, Sketch Bot. S. Car. and Ga. (1824).  
*Gerardia domingensis* Spreng., cur. Linn., Syst. Veg. (1825).  
*Agalinis fasciculata* (Ell.) Raf., New Fl. Amer. (1837).  
*Gerardia galvesiana* Greene, Pittonia (1903).  
*Gerardia langloisii* Greene, Leaflets Bot. Obs. and Crit. (1910).  
*Gerardia asprella* Greene, l.c. (1910).

Stems scabrous with many stiff hairs on the sides and angles; axillary fascicles usually well-developed on the main stem and often on the lower portions of flowering branches.

Distribution: On dry sandy soil in the southern Coastal Plain and somewhat northward in the midwest. The variety has been collected from western Tennessee and one poorly-developed specimen from central Tennessee has been observed.

County records—DAVIDSON: *Shaver 8562* (TENN). FAYETTE: *Sharp, E. Clebsch and Goolsby 6680* (TENN.). HAYWOOD: *Sharp and E. Clebsch 6688* (TENN). MADISON: *Sharp, Underwood and E. Clebsch 6874* (TENN). SHELBY: *Sharp, E. and A. Clebsch 6624* (TENN). TIPTON: *Sharp, E. and A. Clebsch 6429* (TENN).

While some extreme forms with penicillate branching appear very distinct the variety, nevertheless, completely intergrades over a broad area with the typical variety. No two characters appear to be correlated with each other.

g. *Gerardia purpurea* var. **racemulosa** (Pennell) comb. nov.*Agalinis virgata* Raf., New Fl. Amer. (1837).*Gerardia racemulosa* Pennell, in Torrey (1911).

Stems and branches glabrous; leaves usually strongly curved when dry; axillary fascicles poorly developed or lacking.

Distribution: In moist sandy soil in pine-barrens or occasionally in open areas. Mostly occurring in the eastern Coastal Plain from Long Island to South Carolina, inland to the eastern border of Tennessee.

County record—BLOUNT: *Jennison 2908* (TENN).

Using the glabrous condition as the only character the variety appears to be almost completely restricted to the eastern Coastal Plain. The Tennessee specimen appears to be a disjunct with the closest previous records known being from eastern North Carolina.

h. *Gerardia setacea* (Walter) Gmelin, cur. L., Syst. Nat. ed XIII (1791).*Anonymos setacea* Walt., Fl. Carol. (1788).*Agalinis setacea* (Walt.) Raf., New Fl. Amer. (1837).*Gerardia holmiana* Greene, Pittonia (1899).*Agalinis holmiana* (Greene) Pennell, Bull. Torrey Bot. Club (1913).

Erect, annual herbs with numerous ascending branches; stems slightly scabrescent with minute stiff hairs near the nodes; leaves mostly 1.5-4.0 cm. long; flowers borne in racemes or occasionally on rather short side-branches, subtending leaves not reduced to minute bractlets; mature pedicels 1-2 cm. long; calyx 2.5-3.5 mm. long, slightly lobed; corolla 1.4-2.3 cm. long, with spreading lobes, internally long-pubescent at the bases of the posterior lobes, reddish-purple with two yellow lines and numerous purple spots anteriorly; capsules 3-6 mm. long, globose.

Distribution: In dry, sandy soil in somewhat open pine or oaklands on the Coastal Plain from Long Island to Georgia and inland in the Carolinas to the eastern edge of Tennessee. Reported recently from Tennessee by Shaver (1957).

County record—BLOUNT: *Jennison 3428* (TENN).

This species varies from forms similar to *G. gattingeri* to those resembling *G. tenuifolia*. From the former it differs most noticeably in the darker color of the stem and corolla. From the latter it differs by having long hairs internally at the bases of the upper corolla lobes. *G. tenuifolia* also differs in many cases by having broader leaves on the main stem and the racemose branches longer with mature flowers farther from the apices, but these characters are not generally dependable.

i. *Gerardia skinneriana* Wood, Class-Book (1847).*Agalinis skinneriana* (Wood) Britton, in Britton and Brown, Ill. Fl. Northern U. S. and Can. ed. II. (1913).

Erect, annual herbs with a number of long, ascending branches; stems scabrescent on the angles with minute, stiff hairs, below with rounded and somewhat striate sides; leaves opposite with some subopposite above, up to 2 cm. long on the main stem, branch leaves mostly 8-10 mm. long below, becoming reduced to 2 mm. long toward the tips of flowering branches, 0.5-1.0 mm. broad, scabrous above, on the margins and on the midvein below; flowers usually on distinctly racemose branches, either single or paired at the nodes, a few appearing terminal on short side-branches; pedicels usually 5-20 long, slightly exceeded by to far exceeding the subtending leaves; calyx 2.5-3.5 mm. long with somewhat callose lobes about 0.3-0.5 mm. long; corolla 12-14 mm. long, with spreading lobes, internally long pubescent at the bases of the posterior lobes, pale in color and probably pink when fresh; capsules 4-5 mm. long, globose.

Distribution: In dry sandy soil in rather open areas, from the southern Great Lakes southward to the Gulf of Mexico, east nearly to the Cumber-



lands and west into Kansas. In Tennessee it is known only from the southeastern Highland Rim area.

County record—COFFEE: *Shaver 8563* (TENN).

*Gerardia skinneriana* has not previously been reported from Tennessee. The Coffee county specimen and a specimen seen from Ocean Springs, Mississippi (*Seymour 9199.39*) are both considerable extensions of the range cited by Pennell.

The combination of rather short leaves, moderately long-pedicelled flowers on primarily racemose branches, the short, somewhat callose lobes of the calyx and the scabrescent angles of the stems distinguishes the species from the others of the genus.

j. *Gerardia tenuifolia* Vahl, Symb. Bot. (1794).

*Chytra anomala* Gaertn. f., Fruct. et Semin. Plant. (1805).

*Gerardia tenuifolia humilis* Benth., in Hook., Compan. Bot. Mag. (1836).

*Agalinis tenuifolia* (Vahl) Raf., New Fl. Amer. (1837).

Erect, annual herbs with numerous, long, ascending branches; stems slightly scabrescent with minute, stiff hairs, especially near the nodes; leaves opposite, up to 3.5 cm. long on the main stem, mostly 1.5-2.5 cm. long, up to 4 mm. broad; flowers paired at the nodes in long racemes; pedicels 1-2.5 cm. long, slightly or considerably shorter than the subtending leaves; calyx 2.5-6.0 mm. long with lobes 0.5-1.0 mm. long; corolla 11-18 mm. long, with three lower lobes spreading and the two posterior lobes somewhat smaller and arched over the stamens, glabrous internally, reddish-purple with two yellow lines and numerous purple spots anteriorly; capsules 3-6 mm. long, globose.

Distribution: In dry woods, thickets and fields, widely distributed in the eastern United States except in the eastern Coastal Plain. The species occurs in all parts of Tennessee.

County records — ANDERSON: *Meyer 1058* (TENN). BLOUNT: *Sharp 5362* (TENN). CHESTER: *Bain 339* (P). CLAIBORNE: *Frick 33* (LMU). COCKE: *Sharp 20208* (TENN). CUMBERLAND: *Shaver 8552* (TENN). DICKSON: *Shaver 8576* (TENN). FENTRESS: *Bain 42* (TENN). GRAINGER: *Morrison and Brown 10a* (TENN). HAMILTON: *Ford and Russell 2282* (TENN). KNOX: *Ainslie 837* (TENN). MONROE: *Gillespie, Laing and Sharp 18751 part* (TENN). MORGAN: *Wherry and Pennell 13961* (P). POLK: *Wherry and Pennell 14002* (TENN). RHEA: *Shaver 8543* (TENN). ROANE: *Shaver 8558* (TENN). SCOTT: *Wherry and Pennell 13914* (P). SEVIER: *Bechtel 8-21-21* (TENN). UNION: *Frick 344* (TENN).

Though variable in itself, *Gerardia tenuifolia* can be distinguished from other species easily by the combination of the glabrous interior of the corolla and the long racemose branches with the pedicels nearly equal in length, not exceeding the subtending leaves. Toward the west the species grades into the following variety.

k. *Gerardia tenuifolia* var. *macrophylla* Benth., in Hook., Compan. Bot. Mag. (1836).

*Gerardia besseyana* Britton, Mem. Torrey Bot. Club (1894).

*Gerardia lancifolia* Greene, Pittonia (1899).

*Agalinis besseyana* (Britton) Britton, in Britton and Brown, Ill. Fl. Northern U.S. and Can. ed. II. (1913).

*Agalinis tenuifolia macrophylla* (Benth.) Blake, Rhodora (1918).

Calyx-lobes 1.0-2.5 mm. long; capsules 5-7 mm. long.

Distribution: In woodlands fields and low prairies from Pennsylvania to central Kansas and southward to central Alabama and eastern Texas. The variety is found in the western, central and southeastern parts of Tennessee.

County records — COFFEE: *Shaver 8556* (TENN). CROCKETT: *Sharp and E. Clebsch 6749* (TENN). DAVIDSON: *Shaver 8582* (TENN). DECA-

TUR: Ames (P). DICKSON: Shanks, Woods and Cooley 14813 (TENN). FRANKLIN: Eggert (P). HAYWOOD: E. Clebsch and Sharp 6759 (TENN). MARION: Pennell 5714 (P). McMINN: Bain (P). McNAIRY: Svenson 4329 (TENN). MONROE: Gillespie, Laing and Sharp 18751 part (TENN). MONTGOMERY: Shanks BB3825 (TENN). RUTHERFORD: Quarterman 4056 (VDB). SHELBY: Sharp, E. Clebsch and Goolsby 6545 (TENN). TIPTON: Sharp, E. and A. Clebsch 6502 (TENN). WARREN: Shaver 8553 (TENN). WAYNE: Woods, Shanks and Cooley 9201 (TENN). WHITE: Shaver 8577 (TENN).

*Gerardia tenuifolia* var. *macrophylla* nearly replaces the typical variety in the areas adjacent to the upper Mississippi Valley. Toward the west it is in turn replaced by the variety *parviflora*, having more conspicuous axillary fascicles and the leaves and branches more ascending.

#### Summary

Eight species with a total of eleven varieties of *Gerardia* from Tennessee have been identified. Of these *G. pseudophylla* and *G. skinneriana* are reported for the first time and *G. purpurea* var. *racemulosa* is reported with previous reports being based on misidentifications. *G. purpurea* var. *fasciculata* and var. *racemulosa* are reduced from species to varietal status..

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#### NEWS OF TENNESSEE SCIENCE

##### Vanderbilt University

R. B. Channell, of Vanderbilt has been awarded a grant of \$18,000 from the National Science Foundation for a taxonomic revision of the Eurhynchospora portion of the genus Rhynchospora (Cyperaceae). This project will cover a three-year period.

Drs. R. J. and Ruth Neff, of Vanderbilt, recently received a research grant of \$50,000 from the National Institutes of Health for a three-year study of nuclear functions and growth synchrony in amoeba.

Dr. Wm. C. Sloan, Instructor in Biology, left Vanderbilt in January to accept a twelve-month research Post-Doctoral fellowship from the National Institutes of Health. He will be located at the University of California, Berkeley, where he will carry out an investigation of the end-products of nitrogen metabolism in terrestrial invertebrates.

Dr. J. J. Friauf represented Vanderbilt University at the Darwin Centennial Celebration in Chicago, November 24-27.

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