

CONTRIBUTIONS FROM THE GRAY HERBARIUM OF
HARVARD UNIVERSITY—NO. CXXII

I. GONOLOBUS WITHIN THE GRAY'S MANUAL RANGE

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(Plate 494)

ALMOST two years ago Professor Fernald, working over his collection from Virginia, laid aside as perplexing a specimen belonging to the genus *Gonolobus* Michx. Fl. Bor.-Am. l. 119 (1803), i. e. *Vincetoxicum* Walt. Fl. Carol. 13, 104 (1788). Although there is no doubt as to the priority of Walter's name, nevertheless the continued use in Europe of *Vincetoxicum* Moench, Method. 717 (1794) produces a nomenclatural confusion of generic names which calls for some deliberation. Further, the situation was not covered in the statement of the cases for "Conservation of later Generic Homonyms," Kew Bull. (1935). Since the question must be settled sooner or later for the coming issue of the Manual, Professor Fernald requested that I assemble the literature and specimens immediately available for this study. The outcome of this work is briefly given below.

A proposal for the conservation of *Gonolobus* Michaux against *Vincetoxicum* Walter was submitted to Miss M. L. Green, Secretary of the Special Committee on Phanerogamae and Pteridophyta. Her reply is as follows, "the better way is to conserve *Vincetoxicum* Moench, Method. 717 (1794); if this is conserved, then *Vincetoxicum* Walt. becomes a nomen rejiciendum and *Gonolobus* becomes the right name for the genus." She cited fifteen additional references for *Vincetoxicum* Moench and added, "I am sure you will agree that the conservation of *Vincetoxicum* Moench is very desirable and thus it is

the simplest way to solve all difficulties." Again in another letter she pointed out that "The European *Vincetoxicum* is so widely used that there is every chance of its being conserved."

Superficially this seems to clear the way to use the name *Gonolobus* for our plant of southeastern United States. Unfortunately, at different times two entirely unlike concepts have been accepted for the genus: (1) Michaux's original as interpreted by Professor Asa Gray, Proc. Amer. Acad. xii. 75-79 (1877), Syn. Fl. ed. 1 and ed. 2, ii¹. 102 (1878 and 1886); and (2) that of Miss Anna Murray Vail, Bull. Torr. Bot. Club, xxvi. 425-431 (1899). Many botanists earlier than A. Gray maintained *Gonolobus* as delineated by Michaux, nevertheless, Gray's particular interpretation is in sharp contrast with Miss Vail's, since both left evidence of a detailed examination of all the original material of the genus. Michaux's description of the genus *Gonolobus*, although slightly more amplified than that of Walter's *Vincetoxicum*, is unquestionably synonymous with the latter; in addition, Michaux specifically mentioned *V. gonocarpos* Walt. and *V. acanthocarpos* Walt. as synonyms of his *G. macrophyllus* and *G. hirsutus* respectively. In so doing, according to our present International Rules of Nomenclature, he invalidated his own specific names. The third species, *G. laevis*, is poorly described. The type material (fide Vail) is a mixture of flowers corresponding in part to Michaux's *G. laevis*, and foliage and fruit belonging to *Enslenia albida* Nutt., i. e. *Ampelamus albidus* (Nutt.) Britt. This fact was noted by both Miss Vail and Dr. Gray, each choosing a different part of the mixture as the type of the species.

Miss Vail, guided by foliar characters, chose the material of *Enslenia albida* Nutt.¹ By doing this, she believed she had cleared up the discrepancy between the original description of the species and the plants passing as such. Unfortunately, since she had restored Michaux's first two species to the genus *Vincetoxicum* Walt., she was compelled to use *G. laevis*, the only remaining species, in order to maintain the genus *Gonolobus*. That is, she took up the name *Gonolobus* in the sense of *Enslenia* Nutt. She did this apparently unmindful of the

¹ Rightfully the specimens of *Enslenia albida* Nutt. (*Gonolobus laevis* sensu Vail, Bull. Torr. Bot. Club, xxvi, 427 (1899), non Michx.) should be called *Ampelamus albidus* (Nutt.) Britt. as *Enslenia* Nutt. Gen. 1. 164 (1818) is antedated by *Enslenia* Raf. Fl. Ludovic. 35 (1817). Rafinesque called attention to this in Journ. Phys. lxxxix. 258 (1819) and Amer. Month. Mag. iv. 192 (1819), but Britton actually made the combination *Ampelamus albidus*, Bull. Torr. Bot. Club, xxi. 314 (1894) (as *Ampelanus*).

vast discrepancy between the floral characters (cf. particularly the contrast in the stigmas) of her chosen type and Michaux's original description of the genus. In this she has been followed by a number of American authors.

On the other hand, Dr. Gray, in his consideration of Michaux's third species, accepted that part of the material belonging to *Gonolobus* (excluding one flower-cluster of somewhat uncertain identity) as *G. laevis* and was content at that. By this interpretation *Gonolobus* Michaux is a thoroughly consistent and distinct genus. This is the concept first accepted by Robert Brown in his paper "On the Asclepiadaceae," Mem. Wern. Nat. Hist. Soc. i. 12-78 (1811), and by many later authors. On this basis the genus now contains over one hundred described species. Although approximately forty of these have been transferred to *Vincetoxicum* Walt. by Standley and others, *Gonolobus* is the name most widely known in literature and adopted by all who have done monographic work on the family.

The indication of a type-species should be a helpful factor in wholly re-establishing the older and original concept. Not having discovered any in the literature examined, I am here choosing *G. macrophyllus*, the first of the three described by Michaux, as the standard-species of the genus. This species has not only the (usually) angled pod (from which character the name is derived) but also the more important generic character of the flattened stigma. *G. macrophyllus* has been somewhat buffeted about. Gray regarded it as a variety of *G. laevis*, and Michaux automatically created an invalid name by citing *V. gonocarpos* Walt. as a synonym. Nomenclaturally the species appears to be *G. gonocarpos* (Walt.).

Below is given a key and a short summary of the species occurring within the Manual range. Plate 494 shows, in particular, buds, corolla-lobes and pollinia (figs. including retinaculum, caudicles and pollinia). It has been suggested that the more dependable characters are to be found in the pollinia [in the broader sense used to include the retinaculum (the body to which the pollen masses are attached), the caudicles (arms between the pollen masses and the retinaculum) and the pollinia (strictly speaking, the pollen masses)] than in the emphasized characters of the corona. From the plate it will be seen that the characters of the pollinia are perhaps [more] useful in separating groups of species rather than single species. Much broader study would be essential to any further statement on these characters.

KEY TO SPECIES OF GONOLOBUS WITHIN THE MANUAL RANGE

- a. Follicles costate-angled, not muricate: calyx glabrous or slightly pubescent toward the apex of the lobes: crown low, 10-lobed, at base of anther-column: pollinia slenderly obovoid, attached to the retinaculum by caudicles at least 0.2 mm. long; anther-sacs inconspicuous, with narrow slits. Flower-buds short-conical, abruptly acuminate: calyx practically glabrous: corolla-lobes broadly lanceolate, usually pubescent (becoming glabrate) within, 5-7 mm. long, about twice the length of the calyx-lobes. 1. *G. suberosus*.
- Flower-buds conical, gradually acute or acuminate: calyx glabrous or the lobes ciliolate towards the apex: corolla-lobes linear-lanceolate, glabrous within, three or four times the length of the calyx-lobes. 2. *G. gonocarpus*.
- a. Follicles muricate, not costate-angled: calyx pubescent: crown cup-shaped, as high as the anther-column or higher: pollinia semi-lunate or oblong, attached to the retinaculum by caudicles less than 0.2 mm. long; anther-sacs obvious with fairly open slits. . . . b.
- b. Flower-buds bluntly ovoid, corolla rotate. 3. *G. carolinensis*.
- b. Flower-buds oblong-conical, corolla ascending. . . . c.
- c. Crown of fairly thin texture, the long bifid lobes overtopping the anther-column.
Corolla white or whitish, lobes 8-12 mm. long, 1.5-2.5 mm. broad, imbricate but only slightly contorted in the bud: longer teeth of crown-lobes usually subulate 4. *G. Baldwynianus*.
- Corolla brownish-purple, lobes 10-15 mm. long, 3-6 mm. wide, strongly contorted in the bud: longer teeth of crown-lobes flat. 5. *G. decipiens*.
- c. Crown fleshy, as long as or slightly longer than the anther-column.
Corolla-lobes broadly linear, 13-15 mm. long, 2-2.5 mm. wide, dark purple. 6. *G. Shortii*.
- Corolla-lobes slenderly linear, 9-12 mm. long, 1.5-2 mm. wide, greenish-fusces outside, purplish within 7. *G. obliquus*.

1. *GONOLOBUS SUBEROSUS* (L.) R. Br. in Ait. Hort. Kew. ed. 2, ii. 82 (1811); Schultes, Syst. Veg. vi. 59 (1820); Gray, Proc. Amer. Acad. xii. 75 (1877), Syn. Fl. ed. 1 and ed. 2, ii¹. 103 (1878 and 1886). *Cynanchum suberosum* L. Sp. Pl. 212 (1753). *Vincetoxicum gonocarpus* Walt. Fl. Carol. 104 (1788), in part (fide A. Gray). *V. suberosum* (L.) Britton, Mem. Torr. Bot. Club, vi. 266 (1894).

According to various manuals this species ranges from Virginia to Florida, along and near the coast. I have seen no collections from north of North Carolina.

2. *G. gonocarpus* (Walt.) comb. nov. *Vincetoxicum gonocarpus* Walt. Fl. Carol. 104 (1788), in part (fide A. Gray). *Gonolobus macrophyllus* Michx. Fl. Bor.-Am. i. 119 (1803). *G. laevis* var. *macrophyllus* Gray, Proc. Amer. Acad. xii. 76 (1877), Syn. Fl. ed. 1 and ed. 2, ii¹. 103 (1878 and 1886). *G. laevis* Michx. l. c.; Gray, op. cit. p. 75 and p. 103.

Virginia and South Carolina south to Alabama and southwest to Arkansas and Texas. The following collections have been seen. VIRGINIA: sandy wooded bottomland of Nottoway River, Courtland, *Fernald & Long* 6672; rich dry woods, Little Neck, *Fernald & Long* 5004; Powhatan Swamp, $\frac{1}{2}$ mile southwest of Five Forks, *L. F. & F. R. Randolph* 398. NORTH CAROLINA: 5 miles southwest of Durham, *Wiegand & Manning* 2628. SOUTH CAROLINA: without definite locality, *Mellichamp*. INDIANA: 1 mile east of the mouth of White River, *Deam* 32969; in low woods north of Eggwood Pond about 5 miles northwest of Patoka, *Deam* 16925; $\frac{3}{4}$ mile southeast of Yankee-town, *Deam* 37583. KENTUCKY: without definite locality, *Short*. TENNESSEE: Cedar Barrens of Middle Tennessee, *Gattinger*; near Nashville, *Gattinger* (*Curtis*, N. Amer. Pl. 188); Knoxville, *Ruth* 175 in part. ALABAMA, Gadsden, *Vasey*. ARKANSAS: without definite locality, *ex hb. Thurber*. LOUISIANA: without definite locality, *Hale*; near Alexandria, *C. R. Ball* 529. TEXAS: Dallas, *Reverchon*; Houston, *Lindheimer*.

Although Walter's description might be applied to more than one species of *Gonolobus*, I am accepting the interpretation of Dr. Gray and others as to its identity, *i. e.* that it, at least in part, is identical with Michaux's *G. macrophyllus*, hence I have taken up the earlier specific epithet. With the more abundant collections at hand Gray's characters distinguishing *G. laevis* Michx. from var. *macrophyllus* Gray show a high degree of variability, hence, I am inclined to regard them as a single entity.

3. *G. CAROLINENSIS* (Jacq.) Schultes, Syst. Veg. vi. 62 (1820); Gray, Proc. Amer. Acad. xii. 76 (1877), Syn. Fl. ed. 1 and ed. 2, 104 (1878 and 1886). *Cynanchum carolinense* Jacq. Coll. ii. 288 (1788), Ic. Pl. Rar. ii. t. 342 (1788). *Vincetoxicum acanthocarpos* Walt. Fl. Carol. 104 (1788). *Gonolobus hirsutus* Michx. Fl. Bor.-Am. i. 119 (1803). *Vincetoxicum carolinense* (Jacq.) Britton, Mem. Torr. Bot. Club, v. 265 (1894). *Odontostephana carolinensis* (Jacq.) Alexander in Small, Man. 1077 (1933).

Delaware south to Georgia (and possibly Florida), west to Tennessee and Alabama. DELAWARE: Middletown, August 16, 1908, *Bartram*; Dover, *Tatnall* 1467. MARYLAND, Middle Neck Road, *Tatnall* 2814; Melwood, *C. P. Smith* 3181; Clinton, *C. P. Smith* 3180. DISTRICT OF COLUMBIA: near Washington, *Holm*, *Vasey*, *Chickering*, *Ward*; Anacostia, *C. P. Smith* 3066. VIRGINIA, dry sandy hickory and oak woods, *Burt*, *Fernald & Long* 3657; north of Moore's Mill, *Fernald & Long* 3656; northern end of Knott's Island, *Fernald & Long* 4145; rich dry woods, Little Neck, *Fernald & Long* 5003; Great Neck, *Fernald*, *Griscom & Long* 4693, 5002; Grove, *L. F. & F. R. Randolph* 361; near Williamsburg, *Grimes* 3666, 3690; near Cedar Creek, Frederic County,

Griscom & Hunnewell 15244. NORTH CAROLINA: 8 miles north of Chapel Hill, *Wiegand & Manning 2630*; near Statesville, *Gray, Sargent, Redfield & Canby*; Tryon, *Churchill*. SOUTH CAROLINA, Santee Canal, *Ravenel*. GEORGIA, without definite locality, *Biltmore Herbarium 3923^b*; near Athens, *Perry 1001*. TENNESSEE: slope of Cumberland Plateau, west of Bon Air, *C. A. & U. F. Weatherby*. ALABAMA: without definite locality, *Short*.

I am unable to say whether Jacquin's or Walter's is the earlier specific name. Walter's name seems to have been lost in synonymy and I have accepted the name customarily used. Dr. Gray believed Walter's species and *G. carolinensis* to be identical. Miss Vail found the latter and *G. hirsutus* Michx. were "entirely impossible" to separate with the material which she had at hand. I am inclined to agree with Alexander who accepted *G. hirsutus* and *G. carolinensis* as synonymous but nevertheless separated another entity passing under *Vincetoxicum carolinense*. A glance at plate 494, figs. 3, 5, and 4, 6, shows the difference in the flower-buds, the spread of the corolla, and the retinacula.

4. *G. BALDWINIANUS* Sweet, Hort. Brit. ed. 2, 360 (1830); Gray, Proc. Amer. Acad. xii. 77 (1877) (as *Baldwinianus*), Syn. Fl. ed. 1 and ed. 2, ii¹. 104 (1878 and 1886). *Vincetoxicum Baldwinianum* (Sweet) Britton, Mem. Torr. Bot. Club, v. 265 (1894). *Odontostephana Baldwiniana* (Sweet) Alexander in Small, Man. 1077 (1933).

Georgia and Alabama west to Missouri and Oklahoma. The following specimens have been examined. ALABAMA: dry woods, *Buckley 10*. MISSOURI: Swan, *Bush 239*; Noel, *Bush 5745*; Cedar Gap, *Lansing 3077*; Eagle Rock, *Bush 230*; near Eagle Rock, along Missouri-Arkansas state line, *Palmer 39460*. ARKANSAS: Beaver, *Palmer 39473*; Washington County, June 1835, *Engelmann*. OKLAHOMA: near Page, *Blakeley 1422*; near Idabel, *Houghton 3946*.

This species is readily recognized by the whitish corolla, the subulate lobes of the crown and the very slender retinacula.

5. *G. decipiens* (Alexander) comb. nov. *Odontostephana decipiens* Alexander in Small, Man. 1077 (1933).

This species of "woods and stream-banks, in rather acid soil, Coastal Plain and occasionally adj. provinces, S. C. to Okla., Mo., and Md." according to Alexander, is represented in our herbarium only from Missouri, Arkansas and Louisiana. MISSOURI: St. Louis County, May 31, 1887, *Eggert*; Allenton, June, 1880, *Letterman*; Meramec Highlands, June 25, 1904, *Gleason*; near Pacific, *Greenman 3899*, June 3, 1918, *Churchill*; Pleasant Grove, *Bush 362*; Prosperity, *Bush 2147*; Oronogo, *Palmer 36033*. ARKANSAS, Camden, June 15, 1850, *Fendler*. LOUISIANA: without definite locality, *Hale*.

The best characters of this species are the oblong-conical flower-bud with corolla-lobes strongly contorted, the ascending corolla and the comparatively longer flat teeth of the crown-lobes. In contrast the flower-buds of *G. carolinense* (from which species this has been segregated) are bluntly ovoid, the corolla of the mature flower is rotate (not ascending), the crown-lobes are somewhat variable, but the pollinia are slightly smaller and the retinacula much smaller than in *G. decipiens*.

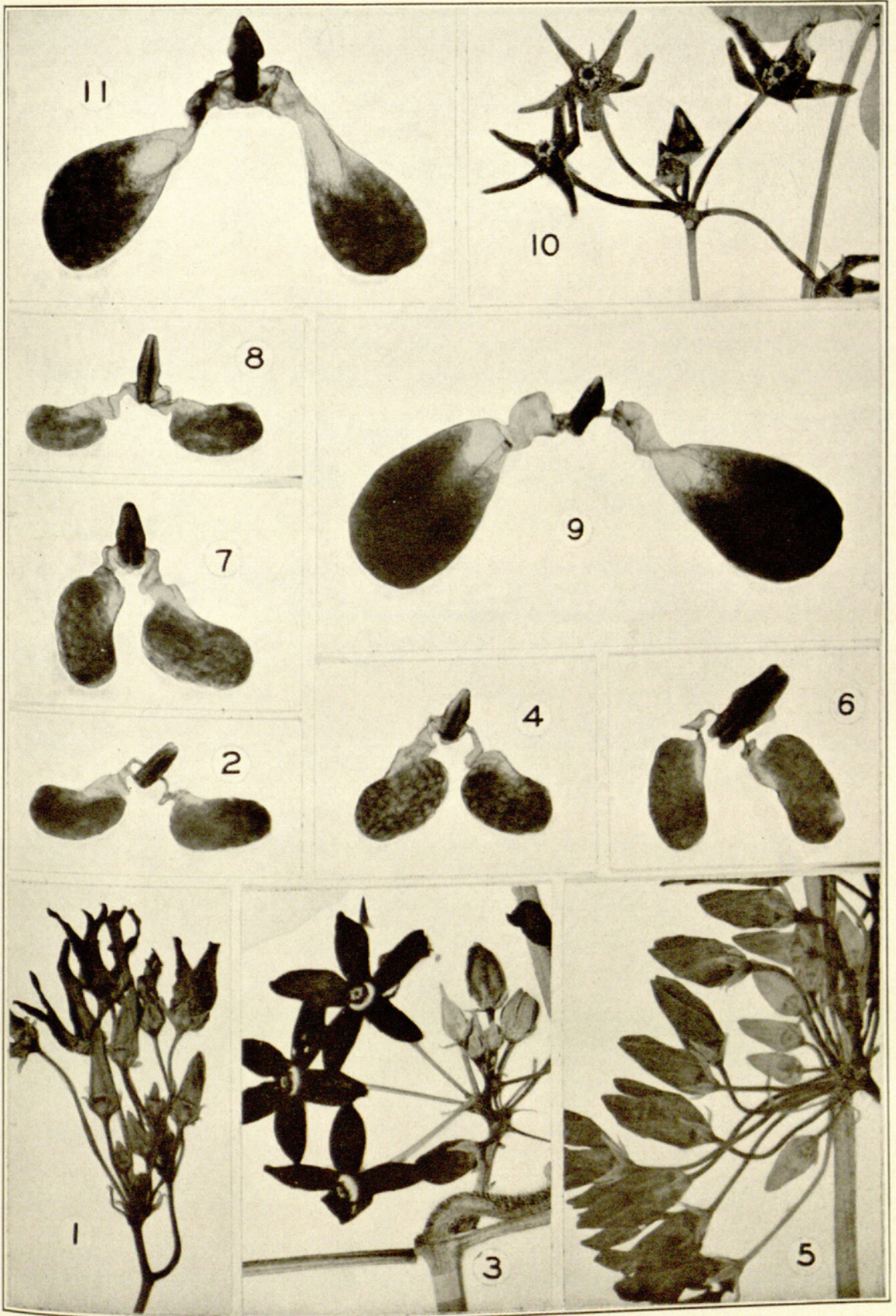
6. *G. SHORTII* Gray, Bot. Gaz. viii. 191 (1883). *G. obliquus* var. *Shortii* Gray, Syn. Fl. ed. 1, ii¹. 104 (1878). *Vincetoxicum Shortii* (Gray) Britton, Mem. Torr. Bot. Club, v. 266 (1894). *Odontostephana Shortii* (Gray) Alexander in Small, Man. 1077 (1933).

Range given by Alexander as Georgia to Kentucky and Pennsylvania. Unfortunately in the Gray Herbarium this species is represented only by the two collections cited by Dr. Gray. KENTUCKY, Lexington, *Short*. GEORGIA, near Rome, 1882, *Chapman*.

7. *G. OBLIQUUS* (Jacq.) Schultes, Syst. Veg. vi. 64 (1820); Gray, Proc. Amer. Acad. xii. 76 (1877), Syn. Fl. ed. 1 and ed. 2, ii¹. 104 (1878 and 1886). *Cynanchum obliquum* Jacq. Coll. i. 148 (1786), Ic. Pl. Rar. ii. t. 341 (1786-93). *Vincetoxicum obliquum* (Jacq.) Britton, Mem. Torr. Bot. Club, v. 266 (1894). *Odontostephana obliqua* (Jacq.) Alexander in Small, Man. 1077 (1933).

Pennsylvania south to Georgia west to Ohio, Indiana, Tennessee and Missouri. PENNSYLVANIA, without definite locality, 1862, *C. E. Smith*; river-banks in Lancaster and Franklin Counties, *Porter*; banks of Susquehanna, Lancaster County, *Porter*. MARYLAND: Bloomington, *J. D. Smith*. DISTRICT OF COLUMBIA: near Washington, *Ward, Holm*. VIRGINIA: near Middletown, *Griscom and Hunnewell* 18815; Peaks of Otter, Bedford County, July 29, 1871, *Curtiss*. NORTH CAROLINA, Hot Springs, Madison County, June 7, 1899, *Churchill*; near Alexander, Buncombe County, *Biltmore Herbarium* 3928. GEORGIA, near Rome, 1882, *Chapman*. INDIANA, along White River, 2 miles above Shoals, *Deam* 17181. TENNESSEE: Knoxville, June and July, 1895, *Ruth*.

Readily distinguished by its many-flowered and very often compound umbels and the linear-ligulate lobes of the corolla.



GONOLOBUS: parts of inflorescences, $\times 1$; pollinia, $\times 40$.

G. OBLIQUUS, FIGS. 1 and 2. *G. CAROLINENSIS*, FIGS. 3 and 4. *G. DECIPIENS*, FIGS. 5 and 6. *G. SHORTII*, FIG. 7. *G. BALDWINIANUS*, FIG. 8. *G. GONOCARPUS*, FIGS. 9 and 10. *G. SUBEROSUS*, FIG. 11.



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