

DISTRIBUTION AND PHENOLOGY OF
GONOLOBUS SUBEROSUS
(APOCYNACEAE, ASCLEPIADOIDEAE)
AND ITS VARIETIES IN NORTH AMERICA

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Abstract. Recent morphological and molecular studies resulted in the recognition of two varieties of *Gonolobus suberosus* in the United States. The objectives of the present study were to (1) provide a list of exsiccatae and (2) present phenological data, as captured from herbarium specimens. Based on queries to sixty-seven herbaria, 578 herbarium specimens of *G. suberosus* from North America were examined, annotated, and catalogued. A critical re-evaluation of four apparently disjunct populations of var. *granulatus* in the East led to the hypothesis that eastern plants exhibiting uniformly colored corolla lobes represent mutants of var. *suberosus*, rather than true disjunctions of var. *granulatus*. This hypothesis is supported by similarities in the coloration and shape of laminar dorsal anther appendages as well as vestiture of the adaxial corolla lobes shared by putative mutant and wildtype var. *suberosus*, but not var. *granulatus*. There appears to be no separation of reproductive phenological activity between the two varieties. Over the period 1895 to 2005, in contrast to previous reports for other taxa, a positive correlation between year of collection and number of specimens with flowers was found for both varieties. The significance of the correlation suggests that collecting effort for flowering material has actually been increasing for both varieties over the past century. No significant correlation was found between year of collection and specimens with fruits. Differences in rates of flowering and fruiting collections may be the result not of collector preference or environmental factors, but of temporal differences in collecting activity coinciding with shifts from flowering to fruiting. Images and a key to the varieties are provided to facilitate identification.

Keywords: *Matelea gonocarpus*, Gonolobinae, anglepods, identification key, exsiccatae.

Whether more than one *Gonolobus* Michx. species (Apocynaceae, Asclepiadoideae) should be recognized for the southeastern United States has long occupied taxonomists and has been additionally complicated by the nomenclatural confusion surrounding *Gonolobus suberosus* (L.) R.Br. (Drapalik 1969; Reveal & Barrie 1992; Krings & Xiang 2004, 2005). In a recent morphometric analysis of the *Gonolobus* complex in the southeastern United States, Krings & Xiang (2004) found former species concepts untenable as stated as the diagnostic characters could not consistently assign individuals to one of two groups. However, the analysis

showed a strong geographic component to the distribution of individuals delimited by uniformly and multi-colored corollas, which was used as a basis for suggesting that two entities do appear to exist in the Southeast that may deserve recognition at some taxonomic rank. These entities were provisionally referred to as a uniformly-colored corolla group (UCCG) and a multi-colored corolla group (MCCG). Subsequently, Krings & Xiang (2005) analyzed Inter-Simple Sequence Repeats (ISSR) to assess if the two entities were genetically differentiated, and if so, to what level. The ISSR results showed genetic differentiation at several

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loci between the two entities, although no fixed differences between them were detected. Nineteen bands were unique to the MCCG, although at various frequencies 3.5–39%, while only a single band was unique to the UCCG, suggesting that the latter possesses a subset of the MCCG gene pool and is likely a derivative of it. In a parsimony analysis of morphological characters of fourteen species of the subgenus, the two southeastern entities consistently appeared as closest relatives (Krings & Xiang 2005). This evidence suggested that the complex represents a single evolutionary

lineage with two incompletely differentiated morphological subgroups. Based on these results, Krings & Xiang (2005) proposed to treat the MCCG and UCCG as two varieties of *Gonolobus suberosus* — var. *granulatus* (Scheele) Krings & Q.Y. Xiang and var. *suberosus*. The objectives of the present work were to (1) provide a list of exsiccatae for specimens studied by Krings & Xiang (2004, 2005) and (2) present phenological data, as captured from herbarium specimens. Images and a key to the varieties are also provided to facilitate identification.

METHODS

Based on queries to sixty-seven herbaria, 578 herbarium specimens of *Gonolobus suberosus* from North America were examined. All vouchers cited have been studied and annotated. With the exception of Florida, label data presented here include state, county, directions to locality, date, collector(s) and number, and herbaria of deposit. Detailed locality data are not provided for Florida specimens as *G. suberosus* is State listed as threatened in Florida under its synonym *Matelea gonocarpus*

(Walter) Shinnars (Florida Administrative Code Ch. 5B-40.0055). Occurrences were mapped at the county level using DIVA-GIS (<http://www.diva-gis.org>) and ESRI ArcView GIS 3.3 (<http://www.esri.com>). County shape files and centroid latitude and longitude data were obtained from the United States Census Bureau (<http://www.census.gov>). Author abbreviations follow Brummitt & Powell (1992).

RESULTS & DISCUSSION

Four collections of entities with uniformly green adaxial corolla lobes (putative var. *granulatus*) appeared disjunct and well inside the range of var. *suberosus*: (1) Harris Co., Georgia (*S.B. Jones 22079*, FLAS, USF), (2) Union Co., North Carolina (*H.E. Ahles 31482*, USF), (3) Surry Co., Virginia (*B. Mikula 2838*, WILLI), and (4) City of Newport News, Virginia (*P. Baldwin 95*, WILLI) (Krings & Xiang 2004). Disjunctions of entities with multi-colored adaxial corolla lobes (var. *suberosus*) in the primary area of var. *granulatus* have not been recorded. However, additional examination of the putative UCCG/var. *granulatus* disjunctions in Virginia, as well as a mixed population in Tennessee during Summer 2006, revealed subtle floral characters missed in earlier studies by Krings & Xiang (2004, 2005). At least in Huntington Park (Newport News, Virginia) and Harrison Bay State Park (Hamilton Co., Tennessee), populations of *G. suberosus* include individuals with both multi-colored and uniformly colored corollas. However, closer inspection led to the hypothesis that the

individuals with uniformly colored corollas in these mixed populations are more likely mutants of the eastern multi-colored var. *suberosus*, rather than representatives of the western uniformly colored var. *granulatus*. Consistent with wildtype var. *suberosus*, the putative var. *suberosus* mutants exhibit a dark-colored, frequently purplish, laminar dorsal anther appendage (Cd sensu Kunze 1995) with strongly developed lateral edges providing a bilobed or emarginate appearance. The Cd of individuals of var. *granulatus* tend to be uniformly yellow (frequently brightly so) and bear a much weaker development of lateral edges and thus an apex that appears rounded to truncate, but not bilobed. The putative mutants also share adaxially pubescent corolla lobes with wildtype var. *suberosus* (Fig. 1b-d), a character state otherwise not observed in var. *granulatus* (Fig. 1a). In addition, the color of the adaxial corolla surface tends to be yellow-green or nearly neon green, in contrast to the olive green of var. *granulatus* (Fig. 1). Although there is a limitation to how well rehydration can

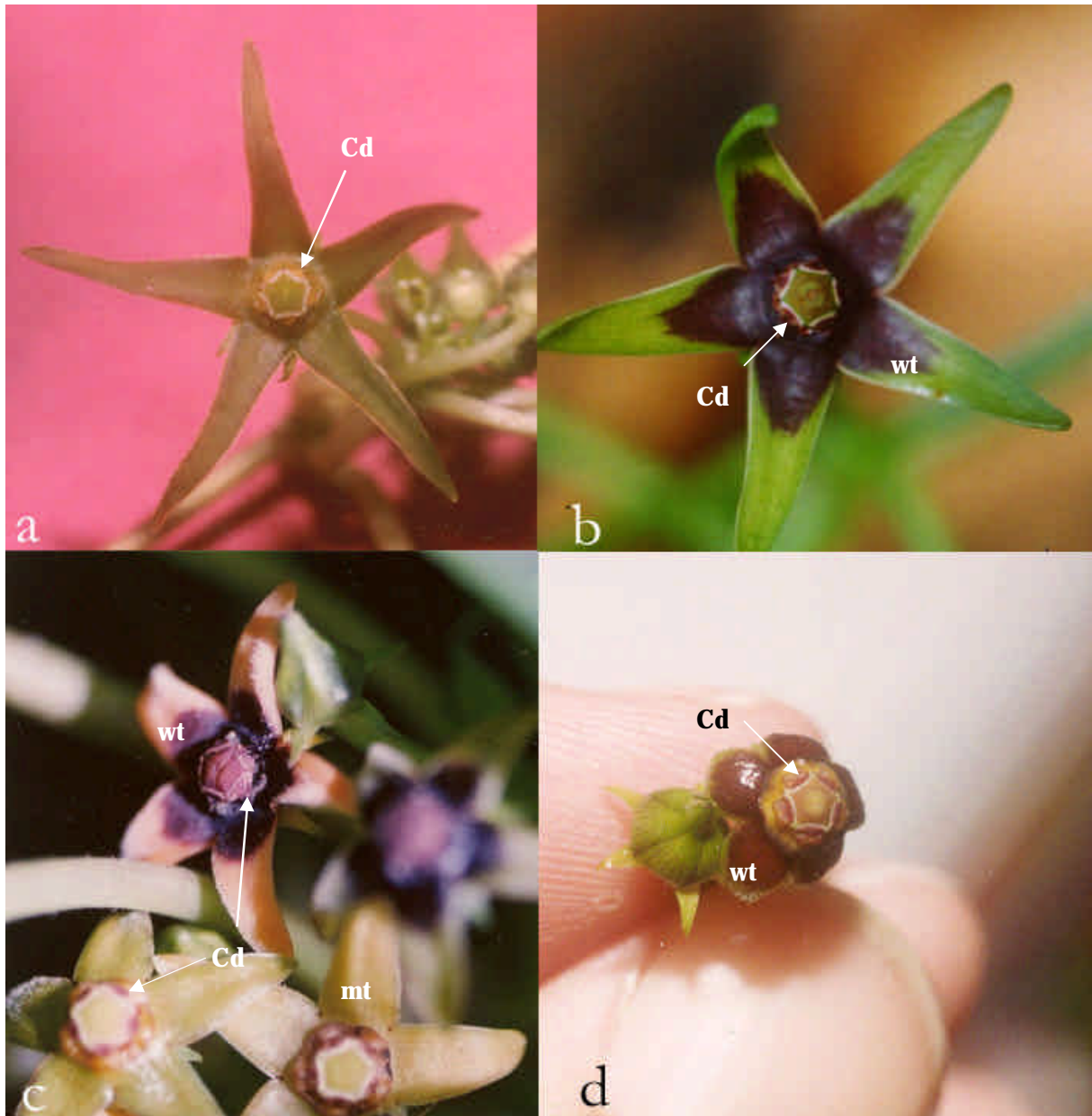


FIG. 1. Flowers of the varieties of *Gonolobus suberosus* (L.) R.Br.: a, var. *granulatus* (Comal Co., Texas); b, var. *suberosus* (Wake Co., North Carolina); c, var. *suberosus* (Newport News, Virginia); d, var. *suberosus* (Alachua Co., Florida). Note the dark purplish laminar dorsal anther appendage (Cd) of putative mutant (mt) and wildtype (wt) var. *suberosus* (b–c, arrowed) versus the yellow Cd of var. *granulatus* (a, arrowed). Putative mutant and wildtype flowers do not co-occur on the same individual vine. The orangish corolla lobes of the multi-colored flower in c are not unusual for a senescing flower.

restore exact shapes of the Cd, until additional data can be brought to bear on the issue, I continue to recognize two varieties in *G. suberosus*, provisionally treating eastern, uniformly-colored individuals as color mutants of var. *suberosus*.

Thus circumscribed, *Gonolobus suberosus* is endemic to the United States and occurs from south-central Texas to south Florida, and north to Kansas, Illinois, Indiana, Kentucky, and Virginia (Fig. 2). Its two varieties display a largely allopatric distribution, with a zone of contact or overlap that extends from southern Mississippi north to northwestern Alabama and eastern Tennessee. More collections are needed from this area to better understand contact zone populations. Based on the distribution pattern provided by specimens with flowers, specimens that are sterile or only bear

fruits can be assigned to a variety with reasonable confidence in most states (Fig. 2).

There appears to be no separation of reproductive phenological activity between the two varieties (Fig. 3). Flowering in both varieties generally begins in April and ceases sometime in August through September. Both varieties start producing fruits within a month or two of the commencement of flowering. The largest number of fruiting specimens in both varieties was collected in the months of September and October (Fig. 3). Excluding specimens that could not be confidently referred to either variety, a similar percentage of specimens in fruit was found for both varieties: 17.1 % (45/263) var. *granulatus* and 17.3% (51/295) var. *suberosus*.

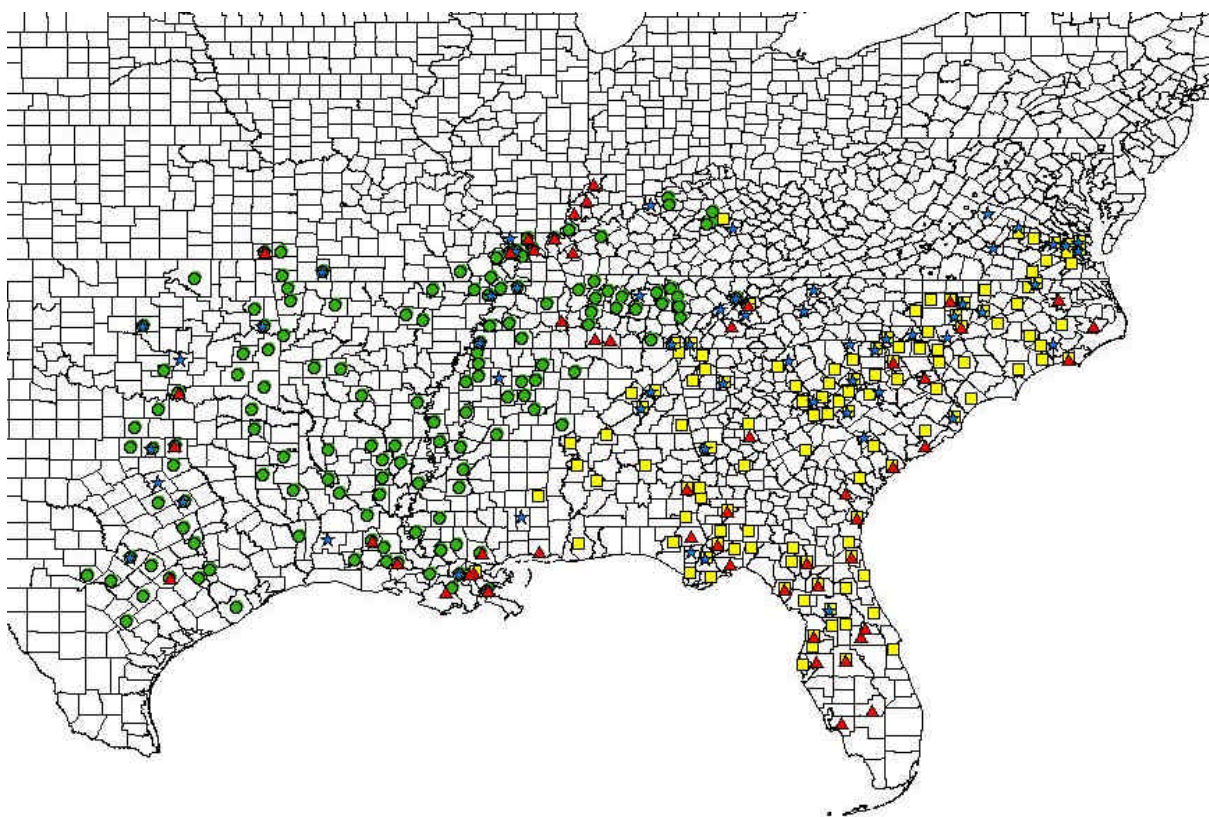


FIG. 2. Distribution of the varieties of *Gonolobus suberosus* (L.) R.Br. in North America. Specimens with flowers: green circles = var. *granulatus*; yellow squares = var. *suberosus*. Specimens lacking flowers: blue stars = specimens with follicles; red triangles = specimens sterile.

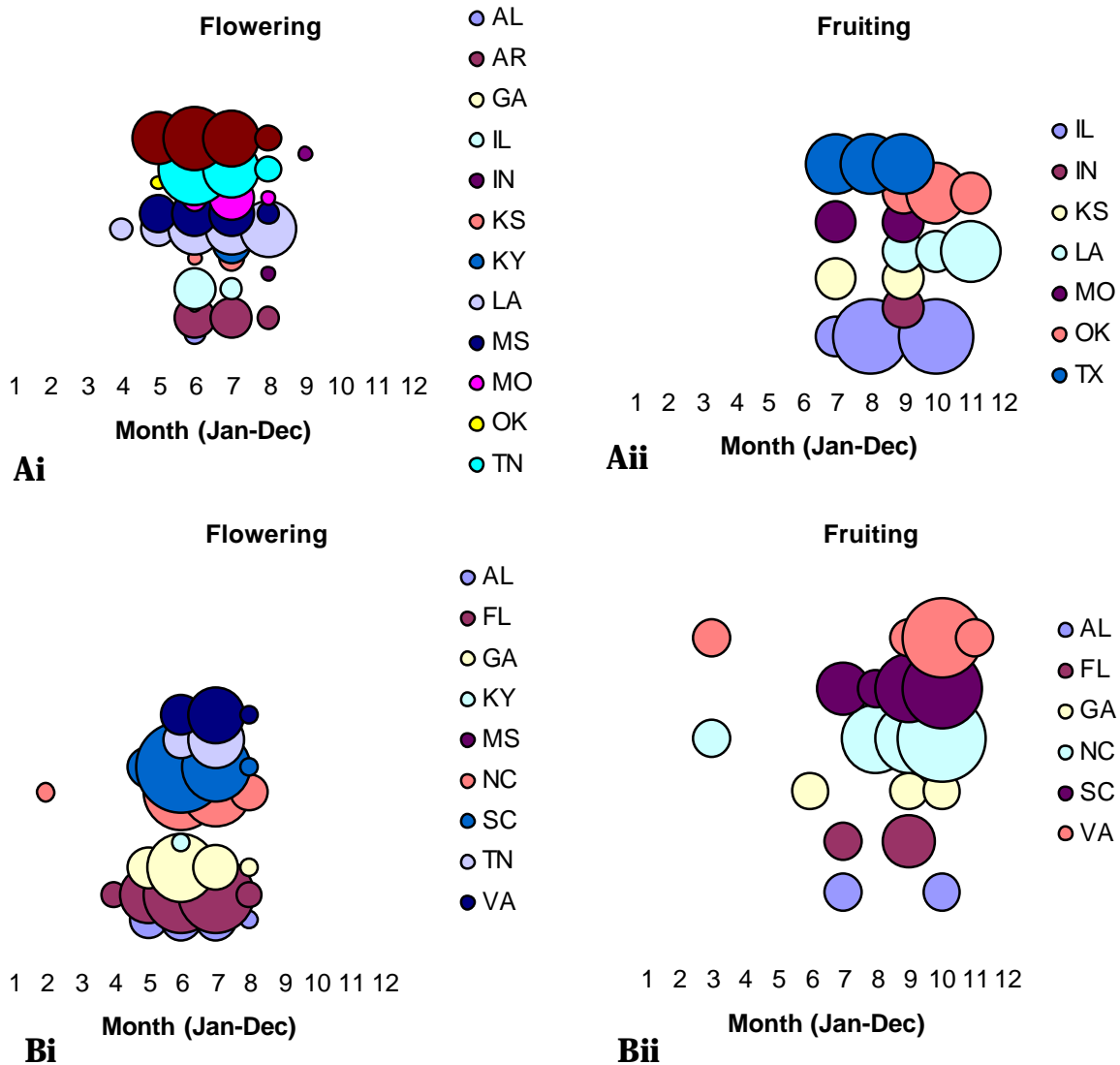


FIG. 3. Flowering and fruiting phenology of the varieties of *Gonolobus suberosus* (L.) R.Br. by state: Ai–ii, var. *granulatus*; Bi–ii, var. *suberosus*. The size of individual bubbles reflects the number of specimens collected in a particular month.

For the present *Gonolobus* data set, over the years 1920–2005, no significant correlation was found between year and number of fruit collections for either variety (Table 1). Examining specimens collected over the period from 1895–2005, a positive correlation between year of collection and number of specimens with flowers was found for both var. *granulatus* ($r^2 = 0.2302$, p value = $9.94E-8$) and var. *suberosus* ($r^2 = 0.2966$, p value = $6.45E-10$) (Table 2, Fig. 4). The regression remains significantly positive for var. *suberosus* ($r^2 = 0.085213$; $F_{0.05, df=20} = 1.7698 > F_{crit} = 0.1991$), even if calcu-

lated based only on the past twenty years. The significance of the correlation suggests that collecting effort for flowering material has actually been increasing for both varieties over the past century. This finding is inconsistent with prior work using a much larger data set (but one that excluded milkweeds) that showed herbarium collections to be on the decline, especially over the last two decades (Prather et al. 2004). That a decline is not apparent for a less than showy taxon, such as *Gonolobus suberosus*, is surprising.

TABLE 1. Correlation between number of collections in fruit and year for the two varieties of *Gonolobus suberosus* (L.) R.Br. over the period 1920–2005.

var. *granulatus* ($r^2 = 0.00001529$)

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>P value</i>
Regression	1	0.810689	0.810689	0.001285	0.971490095
Residual	84	52996.69	630.913		
Total	85	52997.5			

var. *suberosus* ($r^2 = 0.009045$)

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>P value</i>
Regression	1	479.373	479.373	0.766732	0.383726965
Residual	84	52518.13	625.2158		
Total	85	52997.5			

The disparity between significantly increasing flowering collections vis-à-vis constant fruiting collections could be explained by several scenarios. Differential preference by collectors for specimens with flowers versus fruits could result in the differences in correlations between year and numbers of collections for flowering and fruiting material—especially in light of the fact that taxonomic treatments have relied on flowers for distinguishing among the taxa (Krings & Xiang 2004, 2005). An alternative explanation could be that

fruiting is actually declining among members of this species (perhaps due to climatic or pollinator shifts), as increased collection effort for flowering material could be expected to result in concomitant increases in fruiting material. Given the “novelty” of the winged follicles, it seems unlikely that a collector would choose not to collect a follicle if it was present along with flowers. However, the peaks for flowering and fruiting of both varieties appear quite separated temporally. The number of flowering collections for both varieties peak in June/July (var. *suberosus*: 85/74; var. *granulatus*: 79/71). Fruiting collections of both varieties peak in September/October (var. *suberosus*: 10/15; var. *granulatus*: 7/6). During these peak months of fruiting, only a single flowering specimen has been collected (Fig. 3). In fact, at least based on collections, flowering appears to start declining in July, drops significantly in August, and then precipitously in September. Conversely, during the June peak of flowering in both varieties, only a single fruiting collection has been taken (Fig. 3). The collection of fruits increases in August, but at this point flowering is already in precipitous decline. Thus, evident differences in rates of flowering and fruiting collections may be the result not of collector preference or environmental factors, but of temporal differences in collecting activity coinciding with shifts from flowering to fruiting. Fewer fruiting collections are likely reflective of fewer *total* collections made in the autumn months of

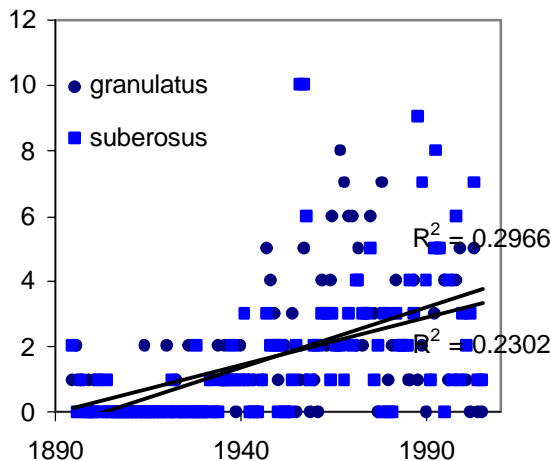


FIG. 4. Number of herbarium specimens with flowers (y-axis) versus year of collection (x-axis) over the period of 1895–2005 for the two varieties of *Gonolobus suberosus* (L.) R.Br.

TABLE 2. Correlation between number of collections with flowers and year for the two varieties of *Gonolobus suberosus* (L.) R.Br. over the period 1895–2005.

var. *granulatus* ($r^2 = 0.230178$)

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>P value</i>
Regression	1	26231.13	26231.13	32.59125	9.94E-08
Residual	109	87728.87	804.852		
Total	110	113960			

var. *suberosus* ($r^2 = 0.296614$)

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>P value</i>
Regression	1	33802.17	33802.17	45.96476	6.45E-10
Residual	109	80157.83	735.393		
Total	110	113960			

peak fruiting activity, whereas increases in flowering collections the result of increasing collector activity in summer months. As the majority of collections have been made by persons associated with universities (either faculty or students), the autumnal drop in collections could be largely explained by return to classes and university commitments. However, this is not to say that changes in pollination success or fruiting behavior have not occurred or are presently occurring. Severely limited pollination visitation and fruit-set rates have been documented in *G. suberosus*, as well as in other climbing milkweeds and the further exploration of long-term trends are necessary to address questions of both conservation and evolutionary biology (Liede 1994; Lipow & Wyatt 1998; Krings 1999; see also ASCLEPOL¹ and references therein). In fact, much of the basic biology, including pollinators, of this species—as of so many in the Southeast—remains unknown. Drapalik (1969) captured small dipterans (all Chloropidae) on flowers of *G. suberosus*, but it remains unclear whether they are effective pollinators due to their size (1.5–3 mm) and lack of pollinaria on capture. Lipow & Wyatt (1998) also attempted to determine pollinators for the species, but were unsuccessful despite daily and nightly searches. Pollina-

tors have not been documented (or at least not reported in mainstream publications) for any other species of *Gonolobus*²—a genus including 100–150 species.

Although long-term phenological shifts in fruiting behavior could not be determined using the present dataset, the utility of exsiccatae and herbarium databases to explore whether long-term floristic and phenological changes have occurred will only increase as more collections go online and become networked. With the assumption of equal collecting effort over a given period (or with an understanding of its trend through data exploration), herbarium specimens can provide a means to assess whether taxa are exhibiting statistically significant differences in rates of fruit set and whether such differences are correlated with environmental parameters. When collecting effort is shown to be increasing, a negative correlation between fruit production and year of collection, over a given period, can be a significant finding that needs to be seriously explored.

A key and exsiccatae follow that seek to document previous work by Krings & Xiang (2004, 2005) and facilitate future studies of the species as well.

¹ ASCLEPOL is a compilation of pollinator records for the former Asclepiadaceae. It currently resides at: http://www.uni-bayreuth.de/departments/planta2/research_wgl/pollina/as_pol_t.html. For more information, see Ollerton & Liede (1997).

² Although the ASCLEPOL database currently lists pollinators for *G. argentinensis* (1 sp. of Calliphoridae, Diptera), the latter has most recently been recognized in *Matelea*.

KEY TO THE VARIETIES OF *GONOLOBUS SUBEROSUS*

1. Adaxial corolla lobes uniformly-colored, olive green on anthesis, glabrous; laminar dorsal anther appendages (Cd) yellow, apex rounded or truncate..... *G. suberosus* var. *granulatus* (Fig. 1a), p. 30
- 1'. Adaxial corolla lobes multi-colored, generally dark maroon to brownish near the base and green to yellowish near the tips on anthesis (or uniformly yellowish-green to neon green in rare mutants), pubescent or glabrous; laminar dorsal anther appendages (Cd) darkly purplish or maroon tinted, apex bilobed to emarginate *G. suberosus* var. *suberosus* (Fig. 1b–d), p. 35

LIST OF EXSICCATAE

The following abbreviations for the phenological condition of specimens are used in the list of exsiccatae: fl=flowering; fr=fruiting; imm=immature; st=sterile.

Gonolobus suberosus (L.) R.Br. var. ***granulatus*** (Scheele) Krings & Q.Y. Xiang, Harvard Papers in Botany 10: 157. 2005.

ALABAMA. *Specimens with flowers or both flowers and fruits.* **Franklin:** Speck cedar glade, ca. 1 mi E of Waco on S side of Al. 24 at jct. with 83, 20 Jun 1980 (fl), *S. McDaniel* 23965 (FSU, UNA). **Pickens:** 6.3 mi NW of Pickensville, 13 Jun 1967 (fl), *S. McDaniel* 9214 (FSU).

ARKANSAS. *Specimens with flowers or both flowers and fruits.* Central Arkansas, Jul 1883 (fl), *F.L. Harvey s.n.* (F); Central Arkansas, Jul 1884 (fl), *F.L. Harvey s.n.* (F). **Benton:** Gravette, 21 Jul 1995 (fl), *R.L. Walker* 6478 (NEMO). **Dallas:** Dalark, elev. 240 ft., 18 Jun 1970 (fl), *D. Demaree* 62244 (WILLI). **Desha:** 15 mi NE of Dumas, 1 mi S of Arkansas River, 12 Aug 1988 (fl), *E. Sundell* 8613 with *A. Van Horn, J. Black, D. Etheridge* (KANU); 3 mi N of Arkansas City on Mississippi River at McCallie Access, 8 Aug 1995 (fl), *E. Sundell* 11704 with *Dale Thomas and Carl Amason* (KANU). **Garland:** Hot Springs, 21 Jul 1879 (fl), *G.W. Letterman s.n.* (F). **Independence:** Near Ark. 106 at Spring Creek, 2 mi W of Batesville, S13 T13N R7W, 26 Jun 1968 (fl), *R.D. Thomas* 9290 (SIU); Bluffs beside White river and Missouri Pacific RR tracks, between Lock 3 and Lafferty Creek, S26 T14N R8W, 6 Jul 1968 (fl), *R.D. Thomas* 10108 (KANU, UMO). **Jackson:** Beside Ark. 18 at Village Creek, 1 mi E of US 67, S29&32 T12N R2W, 8 Jul 1968 (fl), *R.D. Thomas* 10271 with *Bio. 451* (SIU). **Montgomery:** Ouachita National Forest, above Caddo River at Caddo Gap, 7 mi NW on Ark. Hwy 27 from Glenwood, elev. 600–1000 ft, 18 Jun 1954 (fl), *H.H. Iltis* 5118 (F). **Newton:** Lost Valley State Park, 28 Jun 1974 (fl), *R.L. Thompson* 552 (SMS). **Randolph:** Washington Road, off Rte. 166, beside Big Creek, 18 Jun 1976 (fl), *O. Ohmart* 1061 (SEMO). **Sebastian:** Vache Grass Creek at S boundary road, S31 T7N R30W, 8 Jul 1989 (fl), *R.A. Thompson, R. Rudman, and F.L. Johnson* C0776 (KANU). **Washington:** Devil's Den State Park, 5 Jun 1964 (fl), *P.L. Redfearn, Jr.* 14852 (FSU).

GEORGIA. *Specimens with flowers or both flowers and fruits.* **Harris:** Blackmar place, just S of Ossahatchie Creek, ca 2 mi N of Cataula, 10 Jun 1972 (fl), *S.B. Jones* 22079 (FLAS, USF).

ILLINOIS. *Specimens with flowers or both flowers and fruits.* **Alexander:** Along the Cache River, near Unity, 4 Jul 1948 (fl), *G.S. Winterringer* 1151 (ILL); Along Lake Creek at Horseshoe Lake Conservation Area, S12 T16S R2W, 19 Jun 1993 (fl), *M.A. Basinger* 5751 (ILLS); Il. Rte. 3, 0.2 mi SE of jct. Il. 127, W side of Cache River, S12 T16S R2W, 22 Jun 1999 (fl), *S.R. Hill* 31740 (ILLS); Shawnee National Forest, S21 T14S R2W, 23 Jun 1994 (fl), *L.R. Phillipe* 24835 (ILLS). **Hardin:** Rocky wooded bluff, 5 mi E of Cave in Rock, 15 Jul 1954 (fl, fr—imm), *R.A. Evers* 44990 (ILLS – 2 sheets). **Johnson:** Wildcat Bluff, along two-track, just W of parking area, S24 T13S R3E, Jun 1994 (fl), *C.A. Morse* 65 (KANU). **Massac:** Devils washboard woods, 3 mi S of Unionville, 25 Jun 1966 (fl), *R.H. Maxwell* 623 (JEF). **Pulaski:** Il. Rte. 3, 0.3 mi SE of Il. Rte. 127, bridge over Cache River, elev. 305 ft., 22 Jun 1999 (fl), *S.R. Hill* 31733 (ILLS). **Union:** Atwood Ridge Research Natural Area, Jonesboro 7.5 min topographic map, S4 T13S R2W, 6 Jun 1991 (fl), *L.R. Phillipe, E. Ulaszek, and P.E. Phillipe* 19115 (ILLS).

Specimens with fruits only or sterile, but most likely var. granulatus based on distribution of flowering specimens (see Fig. 2). **Alexander:** Horseshoe Lake, 28 Oct 1973 (st), *K. Wilson* 2352 (SIU); Low ground, near Gale, 27 Jun 1956 (st), *F.B. Buser* 6036 (ILLS); Shawnee National Forest, S34 T14S R3W, 25 Aug 1994 (fr), *L.R. Phillipe* 25460 (ILLS). **Hardin:** 3 mi E of Rosiclare, along Ohio River, 6 Oct 1949 (fr), *G.S. Winterringer* 2284 (ILL, ISM); S side of Il. Rte. 146, just W of Hum Wve [sic], 26 Aug 1988 (st, but label mentions strongly angled fruits), *J.B. Taft* 521 (ILLS); 3 mi E of Rosiclare, 6 Oct 1949 (fr), *G.S. Winterringer* 2284 (IMS). **Johnson:** Lowland woods S of Heron Pond, 16 Aug 1968 (st), *J. White* 389 (SIU); 3 mi S of Vienna, Heron Pond Area, 22 Jun 1969 (st), *J. White* 1285 (SIU). **Massac:** Open field, 3 mi

E of Joppa, S28 T15S R4E, 25 Oct 1973 (fr), *J.E. Ebinger 14341* (EIU); Wooded ravine, E of Joppa, 12 Sep 1961 (st), *R.A. Evers 71287* (ILLS); Floodplain of Ohio River, 6 mi N of Metropolis, near Rocky Branch, 17 Oct 1973 (fr), *W. McClain 773* (EIU). **Pulaski:** Route 3, 0.3 mi SE of Il. Rte. 127, E end of bridge at S side of Cache River, S12 T16S R2W, elev. 305 ft., 30 Aug 2001 (fr), *S.R. Hill 34290 with J.A. Koontz* (ILLS). **Union:** Atwood Ridge Research Natural Area, Jonesboro 7.5 min topographic map, S8 T13S R2W, 10 Jul 1991 (fr), *L.R. Phillipe 19210* (ILLS).

INDIANA. *Specimens with flowers or both flowers and fruits.* **Clark:** Indiana Army Ammunition Plant, Charlestown, Fourteen Mile Creek Area, 1 Aug 1997 (fl), *R.H. Maxwell 3151* (JEF).

Specimens with fruits only or sterile, but most likely var. granulatus based on distribution of flowering specimens (see Fig. 2). **Harrison:** Slope of Ohio River, below Tobacco Landing, 1 Sep 1945 (fr), *R.C. Friesner 19534* (BUT). **Gibson:** Near Skelton, 10 Oct 1939 (st), *R.M. Kriebel 7010* (PUL [22660]). **Knox:** Little Cypress Swamp, 14 mi SW of Decker, 2 Sep 1939 (st), *R.M. Kriebel 8433* (PUL – 2 sheets [14736 & 21924]). **Posey:** Edge of swamp, 4 mi W of Mt. Vernon, S3 T7S R14W, 27 Sep 1980 (st), *J. Ebinger 20351* (EIU).

KANSAS. *Specimens with flowers or both flowers and fruits.* **Cherokee:** 1.5 mi S of Galena, 16 Jul 1969 (fl), *K.L. Johnson 2239* (KANU); Rocky wooded bluff, 5 mi N of Galena, 16 Jul 1960 (fl), *R.L. McGregor 15809* (KANU); 5 mi E Baxter Springs, 16 Jul 1947 (fl), *R.L. McGregor and W.H. Horr s.n.* (KANU); Schermerhorn Park, 2 mi S of Galena, 11 Jun 1965 (fl), *S. Stephens 2454* (KANU).

Specimens with fruits only or sterile, but most likely var. granulatus based on distribution of flowering specimens (see Fig. 2). **Cherokee:** 1.5 mi S of Galena, 17 Jul 1970 (fr), *J.E. Bare 2527* (KANU); Galena, 1 mi S Schermerhorn Park and immediate vicinity, S35 T34S R25E, elev. 820–900 ft., 21 Oct 1994 (st), *C.C. Freeman 6827* (KANU); 3 mi E of Crestline, roadside park at Spring River, 22 Sep 1962 (st, fr), *S. Stephens 1294* (KSTC – 2 sheets).

KENTUCKY. *Specimens with flowers or both flowers and fruits.* **Ballard:** Woods NW of Wicklife 1 mi, 27 Jun 1962 (fl), *D. O'Dell and D. Windler 827* (SIU). **Jefferson:** Louisville, [no date given] (fl), *F.H. Snow s.n.* (KANU). **Jessamine:** Hill-top E of Hickman Creek at Ky. River, elev. 800 ft., 28 Jul 1962 (fl), *D. Pittillo 2398* (KY [2 sheets]). **McLean:** River bottoms 3 mi upstream from Calhoun, 13 Jul 1970 (fl), *J. Conrad 1365* (KY). **Mercer:** Side of road at Shakers Bend, 14 Jul 1951 (fl – heavy insect damage), *B.B. McInteer 1122* (KY). **Union:** Near Rockford Bridge, 6 Jul 1936 (fl), *H.T. Shacklette 405* (KY). **Woodford:** 2 mi beyond Versailles on road to Sublet's Ferry, Jul [no year indicated] (fl, fr), *C.W. Short s.n.* (KY).

Specimens with fruits only or sterile, but most likely var. granulatus based on distribution of flowering specimens (see Fig. 2). **Caldwell:** Hunter Bluff area, 9 Sep 1992 (st), *J. Campbell s.n.* (KY). **Madison:** Fort Boonesborough State Park, 19 Aug 1992 (fr—imm), *J.R. Abbott 4125 with R.L. Mears* (FLAS).

LOUISIANA. *Specimens with flowers or both flowers and fruits.* **Assumption:** McDermott Fabrication Corp. off Hwy 90, 17 Aug 1978 (fl), *E. Sundell 2122* (NO). **Caldwell:** Ravine, 4 mi W of Columbia, 18 Jun 1956 (fl), *J.A. Moore 6800* (BRIT, NO, USF); W of Horseshoe Lake, NW of Columbia, Sec. 23, T14N, R3E, 4 Aug 1987 (fl), *R.D. Thomas 101125 and Dendrology Class* (BRIT, USCH, WILLI). **Evangeline:** Lake Chicot State Park, 10 Jul 2003 (fl), *Krings LC-1* (NCSC); Lake Chicot State Park, 10 Jul 2003 (fl), *Krings LC-5* (NCSC). **Iberia:** Weeks Island, 1 Jun 1963 (fl), *J.W. Thieret 15985* (BRIT). **Jefferson:** Edge of Jeff Parish landfill, 28 Jun 1979 (fl), *E. Sundell 2148* (NO); Jeaf Lafitte National Historical Park, 4 Jun 1982 (fl), *S. Darwin 2257* (NO). **Lafayette:** Edge of swamp, 1 mi SE of Broussard, 6 Jul 1938 (fl), *D.S. Correll and H.B. Correll 9381* (DUKE); Along Vermillion River, S side of Lafayette, 23 May 1963 (fl), *R. Kral 17147* (FLAS). **Lafourche:** Hunting preserve, La. 307, 5.6 mi N of Rte. 90, just S of Kraemer, 19 Jul 1987 (fl), *S.R. Hill 18201* (USF). **Livingston:** Springfield, along McCarroll Rd near Hwy 22, 21 Aug 1998 (fl), *G. Montz 8962* (NO). **Morehouse:** Swamp W of US 165 and S of La. 834, S21 T23N R8E, 17 Jun 1992 (fl), *R.D. Thomas 130029 and Aquatic Plants Class* (KANU). **Natchitoches:** Lime Kiln Rd, 2 mi S of La. 6, W of Natchitoches, S6 T8N R7W, 29 May 1989 (fl), *R.D. Thomas 110262* (FLAS). **Orleans:** New Orleans, Apr 1897 (fl), *R.S. Cocks s.n.* (NO). **Ouachita:** Along Illinois Central Railroad, 0.3 mi N of Cypress School Rd. on Ted Williams Rd., S34–35 T16N R2E, 26 Aug 1983 (fl), *D.D. Taylor, B.E. Dutton, and G. Varney 5181* (USF); Ca. 4 mi SW of Luna along hwy to Vixen, 20 Jul 1969 (fl), *J.W. Thieret 31744* (BRIT). **Plaquemines:** Tulane Univ. Riverside Campus, Road B, bunker A-21, 10 Jul 1978 (fl), *N.F. Fleming 258* (NO); Tulane Univ. Riverside Research Laboratories, Road B, on signposts between bunkers A-22 and A-21, 20 Jul 1978 (fl), *N.F. Fleming 305* (NO); Tulane Univ. Riverside Campus, Roads B and first, 25 Aug 1978 (fl), *N.F. Fleming 362* (NO, WILLI). **Rapides:** Vicinity of Alexandria, 2 Jun 1899 (fl), *C.R. Ball 529* (F). **Red River:** Grand Bayou and Coney Branch, beside La. 155, 2 mi NE of Coushatta, S4 T21N R9W, 13 Jul 1975 (fl), *R.D. Thomas 45494* (BRIT). **Richland:** Holly Ridge, 21 Aug '83 [1883?] (fl), *Anonymous s.n.* (F). **St. Charles:** Bonnet Carre Spillway, 1 mi N of Airline Hwy near E guide levee, 20 Aug 1973 (fl), *G. Montz 2745* (NO); 1 mi N of Airline Hwy near E guide levee, 5 Aug 1975 (fl), *G. Montz 3429* (NO); Spoilbank along Cypress Bayou, ca. 3

mi S of Boutte, 13 Jun 1979 (fl), *G. Montz 4823* (NO); St. Charles Borromea Church cemetery, 18 May 1981 (fl), *G. Montz 5224* (NO). **St. Landry:** Along Hwy 190, ca. 3 mi W of Eunice, 25 Jul 1975 (fl), *C.M. Allen 6671* (DUKE, FLAS, WVA). **St. Martin:** Des Ourses Swamp, Happytown Oil Field, Atchafalaya National Wildlife Refuge, S120 T7S R8E, 30°25'36" N 91°38'38"W, 19 May 1994 (fl), *R. Burckhalter 2572* (BRIT). **St. Tammany:** Bayou Cane access W of Lemieux Blvd., S48 T8S R12E, 28 Apr 2000 (fl), *J. Joyner 1301 with D.J. Rosen* (NO). **Tangipahoa:** Along ridge of Lake Pontchartrain, 2 Aug 1973 (fl), *G. Montz 2671 with L. Cutrer* (NO). **Tensas:** Tensas River bottomlands W of Somerset, 13 Jun 1957 (fl), *J. Ewan 19150* (NO); 5 mi WNW of Church Hill, Kings Point E of Miss River, 21 Jun 1967 (fl), *S.B. Jones 13417 with B. Noble, C. Hudson* (MISS). **Union:** Along Corney Bayou, ca. 6.25 mi E of Bernice, 5 Jun 1967 (fl), *J.W. Thieret 26437* (DUKE, FSU). **Webster:** Lake Bistineau State Park, 10 Jul 2003 (fl), *Krings LB-1* (NCSC, FLAS). **West Feliciana:** Woods, Jul 1914 (fl), *R. Cocks s.n.* (NO); Hwy 66, between St. Francisville and Angola, 11 Aug 1978 (fl), *S. Darwin and E. Sundell 777* (NO); Old Tunica Rd, 11 Aug 1978 (fl), *S. Darwin and E. Sundell 821* (NO).

Specimens with fruits only or sterile, but most likely var. granulatus based on distribution of flowering specimens (see Fig. 2). **Beauregard:** On road to Sabine River, 0.5 mi S of Bayou Amacoco, 7 Oct 1960 (fr), *J. Ewan 20122* (NO). **Evangeline:** Lake Chicot State Park, 10 Jul 2003 (st), *Krings LC-2* (NCSC); Lake Chicot State Park, 10 Jul 2003 (st), *Krings LC-4* (NCSC). **Jefferson:** Jean Lafitte National Historical Park, 29 Oct 1980 (st), *T.F. Dowling 294* (NO); Jean Lafitte Park, 23 Nov 1980 (fr), *A.S. Bradburn 1459* (NO). **Orleans:** Little Oak Island, 21 Jul 1981 (st), *L.M. McCook 904* (NO). **Plaquemines:** Delta Wildlife Refuge, 21–22 Nov 1947 (fr), *J. Ewan 17471* (NO); Belle Chasse, Tulane Univ. Riverside Research Laboratories, 30 Sep 1979 (st), *R.D. Suttkus 79-24-06* (NO). **St. Charles:** Hwy 90 near Boutte, 29 Sep 1979 (fr), *E. Sundell 2160* (NO). **St. Martin:** E side of Bayou Teché road to Parks, N edge of St. Martinville, 14 Oct 1956 (st), *J. Ewan 18850* (NO). **St. Tammany:** Military Rd NE of Slidell, 16 Jun 1956 (st), *J. Ewan 18782A* (NO). **Terre Bonne:** Point Barre, ca. 15 mi SE of Houma, Jun–Sep 1960 (st), *A. Fischer 111* (NO); Vicinity of Houma, ca. 1975 (st), *M.C. Hermann 23* (NO).

MISSISSIPPI. *Specimens with flowers or both flowers and fruits.* **Amite:** Homochitto National Forest, at edge of clearcut on USFS gravel road, W of Nub Road, S32 T4N R3E, 29 May 1998 (fl), *M.H. Alford 972* (DUKE); S Greensburg Road at the E Fork Amite River, S of Liberty, S27 T1N R4E, 31°01'N 90°47.5'W, 3 Jun 1998 (fl), *M.H. Alford 1052* (DUKE); Swamp Road at the E Fork Amite River, S10 T2N R5E, 13 May 1999 (fl),

M.H. Alford (DUKE); Trask Road, near tributary to Stafford Creek, 2 mi N of Coppell Road, Clyde Well's property, S25 NW/4 NW4 T1N R2E, 14 May 1999 (fl), *M.H. Alford 1993* (DUKE – 2 sheets); **Attala:** Big Black River area on Hwy 19, just E of Holmes-Attala Co. line, 21 Jul 1968 (fl), *L.C. Temple 10076* (MISS). **Calhoun:** 0.7 mi S of Calhoun City, Hwy 9, 10 Jul 1964 (fl), *T.M. Pullen 64903* (MISS, NCU). **Chickasaw:** Tombigbee National Forest, Goodfood Lake, S6 T12S R4E, 3 Aug 1997 (fl), *J.R. MacDonald 10903b* (DUKE). **Clay:** Tibbee Creek bottoms, ca. 3.8 mi S of West Point, Hwy 45 W, 22 Jul 1969 (fl), *T.M. Pullen 69829* (MISS). **Copiah:** Ca. 1 mi S of Turkey Creek, S2 T1N R3W, 13 Jun 1978 (fl), *K.E. Rogers 45241* (WVA). **DeSoto:** Ca. 0.3 mi S of DeSoto-Shelby County line, 21 Jun 1969 (fl), *R.V. Ferrari 295* (MISS). **Hinds:** Lake Garaway, Clinton, 28 Jun 1964 (fl), *T.M. Pullen 64652* (MISS). **Lee:** 0.25 mi SW of Tupelo city limits off West Rd, 29 May 1982 (fl), *C.T. Bryson 3382* (UNA); Alongside Hwy 6, 5.5 mi W of Tupelo, 16 Jun 1964 (fl), *T.M. Pullen 64393* (MISS, NCU). **Leflore:** NW of Sidon, between Sidon cut-off and old Yazoo Rer run [sic], S19 T18N R1E, 8 Jul 1997 (fl), *C.T. Bryson 16040* (MISS); NW of Sidon, between Sidon cut-off [sic] and old Yazoo River run, S19 T18N R1E, 4 Jun 1999 (fl), *C.T. Bryson 17190* (MISS); NW of Sidon between Sidon cut-off [sic] and old Yazoo River, S19 T18N R1E, 9 Jul 2001 (fl), *C.T. Bryson 18790 with B. Coleman, J.P. Goodlett* (DOV). **Panola:** Loess bluffs, 2.8 mi W of Pleasant Grove, Hwy 315, 11 Jul 1967 (fl, fr), *L.C. Temple 5888* (MISS). **Pontotoc:** Trace State Park, 28 May 1993 (fl), *M.B. Honeycutt and M. Floyd s.n.* (MISS). **Sharkey:** Delta National Forest, 20 Jul 1984 (fl), *E. Sundell and D. Evans 6470* (MUHW). **Tate:** Roadside and adjacent low woods, 4.5 mi W of Strayhorn, Hwy 4, 6 Jul 1967 (fl), *T.M. Pullen 67550* (MISS). **Washington:** E edge of section 28, ca. 2 mi SW of US82 at Leland, S28 T18N R7W, 5–12 Aug 1975 (fl), *C.R. Gunn 10915* (MISS); Bottomland hardwood forest, E of US 61 and 3.5 mi E of Helm on county road 380, 12 Jun 1992 (fl), *R.D. Thomas, C. Bryson, and C. Allen 129898* (KANU, UMO). **Yazoo:** Creek bridge, 5.2 mi W of Pickens, Hwy 432, 30 Jun 1969 (fl), *T.M. Pullen 69592* (MISS).

Specimens with fruits only or sterile, but most likely var. granulatus based on distribution of flowering specimens (see Fig. 2). **Lafayette:** Side of Rte. 7 where hwy crosses Yocona River, 23 Aug 2000 (fr), *B.A. Connolly 174* (MISS).

MISSOURI. *Specimens with flowers or both flowers and fruits.* **Butler:** Floodplain of Mud Creek and the S branch tributary W of state Hwy T and Sec 21 just on E side of Hwy T, 36°53'N 90°19'W, elev. 430 ft., 12 Jul 1994 (fl), *A.E. Brant 2999* (UMO). **Dunklin:** Campbell, 25 Jul 1895 (fl), *B.F. Bush 266* (KSC, WVA); Cardwell, 3 Jul 1934 (fl), *J.W. Cunningham s.n.* (UMO). **Jasper:** Near Waco, 24 Jul 1920 (fl), *E.J. Palmer 18472* (ILL, UMO);

Near Waco, 24 Jul 1920 (fl), *E.J. Palmer 18472a* (ILL); Near Carthage, 19 Jun 1923 (fl), *E.J. Palmer 23405* (UMO). **McDonald**: N bank of Elk Creek, just W of Mo. 43, ca. 2.5 mi SE of Tiff City, S22 T22N R34W, 10 Jun 1962 (fl), *P.L. Redfearn 10236* (FSU, SMS). **New Madrid**: W side of slough NE of Hubbard Lake, 7 mi E of New Madrid, S34 T23N R15E, 4 Jul 1952 (fl), *J.A. Steyermark 73629* (F). **Pemisicot**: Smith-Ellis Cemetery, ca. 0.5 mi W of County Road T on county gravel road 201, just W of Portageville, 9 Jun 1998 (fl), *B. Summers, G. Yatskiyevych, and J. Sullivan 8650* (UMO). **Scott**: Hwy 61, N jct. 77 and S Benton, 7 Jul 1972 (fl), *R. Clinard and T.E. Brooks 118* (SEMO); Along 77, just S of Benton on fence, 7 Jul 1972 (fl), *T. Brooks 6629* (KANU). **Stone**: Near Baxter, 22 Aug 1935 (fl), *J.A. Steyermark 19521* (UMO).

Specimens with fruits only or sterile, but most likely var. granulatus based on distribution of flowering specimens (see Fig. 2). **Pemisicot**: Alluvial woods around Robinson Lake, E of Big Lake, S16 T19N R13E, 18 Sep 1938 (fr), *J.A. Steyermark 6702* (F). **Stone**: E end of Edwards Bluff, along James River, E of Buttermilk Springs, S34 T23N R24 W, 14 Jul 1956 (fr), *J.A. Steyermark 81963* (UMO – 2 sheets).

OKLAHOMA. *Specimens with flowers or both flowers and fruits.* **Cherokee**: Keyough Bluffs, 2 mi E of Ft. Gibson, 28 Jun 1957 (fl), *C.S. Wallis 4344* (OK); 1 mi E and 1 N of Tahlequah, 17 Jun 1967 (fl), *U.T. Waterfall 17268* (OK). **Latimer**: Valley of Gaines Creek, 7 mi SW of Wilburton, 30 Jun 1968 (fl), *F.H. Means, Jr. 3692* (OK). **Le Flore**: Below Wisteria Dam on Poteau River, 1 mi S of Wister, 15 Jun 1965 (fl), *F.H. Means, Jr. 1555* (OK). **Marshall**: 1 mi N of Univ. of Oklahoma Biological Station, Lake Texoma, 2 Jul 1957 (fl), *G.J. Goodman 6477* (BRIT); 4 mi N, 0.5 mi NW of Willis, 20 Jun 1965 (fl), *R. Pearce 1889* (OK—2 sheets). **McCurtain**: Glades, 16 May 1936 (fl), *Garvin s.n.* (BRIT). **Murray**: Chickasaw National Recreation Area, 21 Jun 1994 (fl, fr), *M.D. Proctor, G.E. Brown, and J. Nellesen 0243* (BRIT). **Oklahoma**: Oklahoma City, W side of May Ave., between Reno and 10th, 20 Jul 1941 (fl), *U.T. Waterfall 3031* (OK). **Osage**: Tallgrass Prairie Preserve, The Nature Conservancy, S29 T27N R9E, 2 Jul 1997 (fl), *M.W. Palmer 2174* (OK). **Pushmataha**: 1 mi NE of Kiamichi, 19 Jun 1937 (fl), *U.T. Waterfall 721* (OK). **Sequoyah**: Cookson Hills, 11 mi NE of Vian, 30 Jun 1950 (fl, fr—BRIT), *U.T. Waterfall 9532* (BRIT, BUT, KANU).

Specimens with fruits only or sterile, but most likely var. granulatus based on distribution of flowering specimens (see Fig. 2). **Marshall**: Woods N of Univ. of Oklahoma Biol. Station, 29 Jun 1954, *G.J. Goodman 5887* (BUT—st, peduncle remnant, ILL—fl). **Oklahoma**: Oklahoma City, W side of May Ave., between Reno and 10th, 1

Sep 1941 (fr), *U.T. Waterfall 3555* (OK). **Pontotoc**: 9 mi S of Ada, 19 Oct 1945 (fr), *R. Stratton 6206* (OK). **Sequoyah**: 5.4 mi NE of Gore on State 100, 8 Oct 1957 (fr), *C.S. Wallis 6133* (BRIT).

TENNESSEE. *Specimens with flowers or both flowers and fruits.* **Anderson**: 2 mi E of Lake City, 14 Jul 1940 (fl), *R.M. Kriebel 8875* (PUL [14737]). **Carroll**: Site #1, Milan Ammo. plant, 8 Jul 1993 (fl), *H.R. DeSelm s.n.* (TENN). **Cheatham**: Ashland City, 25 Jun 1962 (fl), *D. Demaree 45769* (BRIT). **Davidson**: Nashville, [no date] (fl), *Gattinger s.n.* (F – 2 sheets); Nashville, 18 mi S on Old Hickory Blvd., 21 Jun 1947 (fl), *E. Quarterman 3002* (DUKE); S of Couchville, 19 Jun 1948 (fl), *S. Fairchild, E. Clebsch, and A.J. Sharp 7570* (TENN); Bluffs of Cumberland by Railroad, ca. 1 mi W of Scotsboro, 17 Jun 1969 (fl), *K.E. Blum 3817* (FSU). **DeKalb**: Dry Creek, 13 Jun 1985 (fl), *M. Guthrie 546* (TENN). **Dickson**: SE of Burns, near Fitzgerald farm, 11 Jul 1947 (fl), *A.J. Sharp, E. Clebsch, and A. Clebsch 47-434* (TENN). **Franklin**: Vicinity of Lost Cove and Lost Cove Creek, “7/8/49” (fl), *P.H.W. Webb and students 175* (TENN). **Hardeman**: Edge of Hatchie River swamps between Pocahontas and Bolivar, 9 Jul 1947 (fl), *A.J. Sharp, E. Clebsch, and A. Clebsch* (TENN). **Hamilton**: Harrison Bay State Park, 23 Jul 2003 (fl), *Krings TN-4* (NCSC). **Haywood**: Roadside W of Shaw, 8 Aug 1983 (fl), *P. Lewis 1203* (TENN). **Hickman**: Hwy 100, 0.1 mi NE of Mill Creek crossing, 8 mi NE of jct with Hwy 48 at Fairfield, 3 Jul 1981 (fl), *G. Nesom 4249* (TENN). **Houston**: Near Ellis Mills, 13 Jul 1952 (fl), *A. Clebsch s.n.* (TENN). **Jackson**: Woods along Flynn Creek Road, ca. 9 mi W of Rte. 56, 11 Jun 1992 (fl), *V.E. McNeilus 92-458* (TENN). **Knox**: Knoxville, Jun 1896 (fl), *A. Ruth s.n.* (TENN); Knoxville, Aug 1896 (fl), *A. Ruth s.n.* (ILL). **Lake**: Walnut log, Jun 1932 (fl), *C.E. Moore H540* (TENN); Field N of Donaldson Ditch, S of Eagle Hacking Area, 11 Jun 1986 (fl), *M. Guthrie 1077* (TENN). **Lewis**: Little Swan Creek Road, 17 Jun 1987 (fl), *M. Guthrie 1849* (TENN). **Marion**: Near Sequatchie River, Jasper, 14 Jul 1934 (fl, fr—imm), *Underwood and Sharp 2581* (TENN). **Montgomery**: Long Pond swamp S of Dotsonville Rd, 18 Jun 1970 (fl), *E.W. Chester 2345* (BRIT); Lock B area on the Cumberland River, Hickory Point side, 9 Jul 1979 (fl, fr), *E.W. Chester 4097* (TENN); Haynes Slough, Ross Farm, Palmyra, 8 Jul 1982 (fl), *P. Somers et al.* [additional collectors not identified on label] *s.n.* (TENN); E side of Cumberland River, across from old Lock B, between Muddy Branch and Midnight Hollow, along TC railroad tracks, 10 Aug 1967 (fl), *E. Wofford and E.W. Chester 1794* (NCU). **Obion**: Grassy Island near Walnut Log, 16 Jun 1942 (fl), *D.E. Eyles and M.S. Eyles 8392* (NCSC); S of Walnut log on Reelfoot Lake Rd, 2 Jun 1970 (fl), *K.E. Rogers and F.D. Bowers 45131* (BRIT, TENN). **Putnam**: Bluff of Rock Springs Branch, ca. 1

mi from Caney Fork River, 28 Jun 1976 (fl), *E. Wofford, D. Webb, L. Rader, R. Phillippe, and D. Smith 51808* (TENN). **Rutherford**: S of Northfield Blvd., 12 Jun 1985 (fl), *M. Guthrie 542* (TENN). **Shelby**: W of Arlington, roadside, 30 Jun 1948 (fl), *S. Fairchild, E. Clebsch, and A.J. Sharp 8187* (TENN). **Smith**: Bluffs along Caney Fork River, 8.1 mi W of Smithville exit off I-40, 9 Jul 1972 (fl), *R. Kral 47439* (NCU - 2 sheets); Plunkett Road slope, ca. 1 mi S of Rauls Creek Road jct, 7 Jul 1995 (fl), *H.R. DeSelm s.n.* (TENN). **Tipton**: Hwy 51, 4 mi S of Covington, 16 Jun 1965 (fl), *K.E. Rogers 33731* (NCU, TENN). **Van Buren**: Limestone slope, W of Spencer, 11 Jun 1958 (fl—imm), *A.J. Sharp 23745* (TENN). **White**: Near Big Dollar Tobacco Warehouse, ca. 2 mi S of Hamptons Crossroads, W side of Hwy 42, 28 Jun 1976 (fl), *R. Phillips, E. Wofford, D. Webb, L. Rader, and D. Smith 51782* (TENN). **Williamson**: Jct of Crockett Rd. and Wilson Pike in NE part of county, in and around Crockett and Own cemeteries, 14 Jun 1987 (fl), *L. Kelly 737* (TENN).

Specimens with fruits only or sterile, but most likely var. granulatus based on distribution of flowering specimens (see Fig. 2). **Decatur**: Along Lick Creek near Cozette, 13 Oct 1949 (st), *F.W. Woods, R.E. Shanks, and E.H. Cooley 14968* (TENN). **Giles**: Between Bethel and Minor Hill, 12 Sep 1949 (st), *R.E. Shanks, F.W. Woods, and E.H. Cooley 9175* (TENN). **Lawrence**: Near Fall River, along E Fork of Sugar Creek, 12 Jul 1948 (st), *A.J. Sharp, E. Clebsch, and A. Clebsch 9732* (TENN). **Monroe**: Near Union Grove, 8 Oct 1961 (st), *A.J. Sharp, W. Ellis, J. Drumke, J.S. Pringle, and G. Ramsey 29674* (TENN). **Obion**: Walnut Log, bank of Bayou de Chiech, 14 Aug 1947 (fr), *A.J. Sharp, E. Clebsch, and A. Clebsch 6193* (TENN). **Roane**: Clinch River Breeder Reactor Site, 15 Aug 1974 (fr), *S.F. Hale and F.E. Williams 48581* (TENN). **Shelby**: Edge of Cow Island, SW of Memphis, 20 Aug 1951 (fr), *F.H. Norris and A.J. Sharp 16319* (TENN). **Wilson**: At intersection of Hwys 109 and US70, 14 Oct 1968 (fr), *K.E. Rogers 42868* (TENN); Cedars of Lebanon State Park, May 1941 (fr), *A.J. Sharp 1568-a* (TENN); Cedars of Lebanon State Park, 27 Jul 1950 (fr), *A.J. Sharp 15323* (TENN).

TEXAS. *Specimens with flowers or both flowers and fruits.* **Austin**: Industry, Jul 1844 (fl), *F. Lindheimer and E. Dapprich 7234* (BRIT). **Bastrop**: Smithville, 14 Jun 1926 (fl), *E.R. Bogusch 1987* (ILL); Buescher State Park, 5 Jul 1957 (fl), *D.S. Correll and I.M. Johnston 17461* (LL); Bastrop State Park, 9 May 1974 (fl), *T. Patterson s.n.* (BRIT). **Brazoria**: Varner-Hogg State Park, West Columbia, 11 Jul 1974 (fl, fr), *R.J. Fleetwood 11093* (BRIT); S side of Kitchel Woods, 29 Aug 1968 (fl), *R.J. Fleetwood 9288* (LL); San Bernard NWR, 28 Jul 1970 (fl), *R.J. Fleetwood 9894* (TEX). **Brazos**: College Station, "6-7-47" (fl), *H.B. Parks s.n.* (TEX). **Comal**: New Braunfels, [no date

given] (fl, fr), *F. Lindheimer s.n.* (neotype: BRIT); New Braunfels, about 100 yds S of Landa Park on Comal Creek, 23 Jun 1996 (fl), *M. Enquist 3090* (TEX); New Braunfels, Landa RV Park and Campground (across Comal River from Landa Falls), 9 Jul 2003 (fl), *Krings L-4* (NCSC, NY). **Cooke**: 8 mi N of Gainesville, on small creek W of Hwy 77 at Red River, 24 May 1946 (fl), *E. Whitehouse 15786* (BRIT). **Dallas**: May 1877 (fl), *J. Reverchon s.n.* (F); Reunion, Jun 1876 (fl), *J. Reverchon s.n.* (F); Below White Rock Lake Dam, 5 Jun 1940 (fl), *C.L. Lundell and A.A. Lundell 9288* (BRIT, LL); Dallas, [no date given] (fl, fr), *E. Dapprich 7233* (BRIT); Dallas, 10 Jun 1901 (fl), *J. Reverchon 2556* (BRIT). **Ellis**: Along White Rock Creek, 11 mi S of Italy, 4 Jul 1957 (fl), *D.S. Correll and I.M. Johnston 17365* (LL). **Fayette**: Hwy 71, 6-8 mi E of La Grange, Jun 1966 (fl), *Strother s.n.* (TEX). **Gonzales**: Ottine, "8-7-26" (fl), *B.C. Tharp s.n.* (TEX). **Harrison**: Caddo Lake State Park, 9 Jul 1975 (fl), *L.N. Lodwick 319* (BRIT); Caddo Lake State Park, 30 Jul 1975 (fl), *R.J. Fleetwood 11771* (BRIT). **Hockley**: [no locality], [no date] (fl), *J.M. Coulter s.n.* (F). **Jasper**: At little roadside park along Hwy 96, ca. 1-2 mi S of Jasper, 13 Jun 1972 (fl), *P.A. Amerson 1221* (BRIT). **Karnes**: San Antonio River bank, 5 mi NE of Karnes City, 13 Jun 1954 (fl), *J.C. Johnson 1582* (BRIT, TEX). **Kendall**: Edge Falls S of Kendalia on Curry Creek, 1 Jul 1984 (fl), *B. Ertter 5475 with L. Hamilton* (TEX). **Limestone**: Fort Parker State Park, Jul 1993 (fl), *J. Singhurst, L. Jones, and K. Blair 1298* (BRIT). **McLennan**: Battle Lake, 5 mi W of Mart, 31 May 1965 (fl), *J. Massey 938* (BRIT); Battle Lake, 0.5 mi W of Battle, 16 Jun 1968 (fl), *J. Massey 2127* (BRIT). **Parker**: Weatherford, 6 Jun 1902 (fl), *S.M. Tracy 7977* (F, TEX). **Red River**: Lennox Woods Nature Preserve, 10 mi N of Clarksville on SH 37, 15 Jun 1993 (fl), *R.W. Sanders 1965* (BRIT). **Robertson**: 2.6 mi SW of Old Salter Farm, tributary to the Little Brazos River, 22 May 1982 (fl), *T. Starbuck 2143* (BRIT). **Rusk**: 7 mi N of Mt. Enterprise, along Rt. 259, 3 Jun 1965 (fl), *D.S. Correll and H.B. Correll 31098* (LL). **Shelby**: 2 mi S of Strong, 18 May 1970 (fl), *D.S. Correll and H.B. Correll 38736* (LL). **Tarrant**: Along the Trinity, 25 Aug 1914 (fl, fr), *A. Ruth 563* (ILL); Between Irving and Arlington, 10 Jun 1944 (fl), *C.L. Lundell and A.A. Lundell 12903* (LL); Boaz Park, Benbrook, 25 May 1948 (fl), *V.L. Cory 54544* (BRIT, KANU, NCSC, LL). **Titus**: SE of West Midway, open improved pasture along stream, 33° 7' 40" 95° 4' 40", 7 Aug 1971 (fl), *J.D. Smith 404* (BRIT); Along Blundell Creek, NE of Monticello community, 15 Jul 1971 (fl, fr), *P.A. Amerson 901* (BRIT). **Travis**: Watkins Ranch in N.W. Travis Co. above Cow Creek on Lake Travis, 2 Jun 1951 (fl), *B.C. Tharp et al.* [other collectors not named on label] 51-969 (BRIT, KANU, TEX); Along Barton Creek, 5 mi N of Oak Hill, 29 May 1949 (fl), *G.L. Webster and N.S. Webster 121* (KANU, TEX); Val-

ley of Barton Creek, ca. 2 mi upstream from Barton Springs in Zilker Park, Austin, 31 May 1989 (fl), *S.L. Orzell and E.L. Bridges 10150* (TEX); S bank of Bull Creek, ca. 50 ft E of dam, ca. 300 ft W of Spicewood Springs Road from low water crossing, ca 2.2 road mi N of jct with Loop 360, 30°24'17" N, 97°47'25" W, elev. 660 ft., 30 Jul 1995 (fl), *W.R. Carr 14779* with *P. McNeal, P. Turner* (TEX). **Waller:** Hempstead, 12 Jun 1872 (fl), *E. Hall 523* (F). **Wise:** Denton Creek, 11 mi E of Decatur, 18 May 1967 (fl), *D.S. Correll and H.B. Correll 34204* (LL).

Specimens with fruits only or sterile, but most likely var. granulatus based on distribution of flowering specimens (see Fig. 2). **Dallas:** Cedar Hill State Park, 15 Aug 1996 (st), *B. Baldon 323* (BRIT); S of Elam, Trinity River bottoms, 17 Sep 1942 (fr), *C.L. Lundell and A.A. Lundell 11983* (BRIT). **Fayette:** Kreishe Brewery State Historical Site, La Grange, 31 May 1991 (st, but peduncle persistent), *Bro. D. Lynch with E. Kutac 7693* (TEX). **Hill:** Cobb Creek, SW of Hillsboro, 9 Sep 1972 (fr), *W.F. Mahler 6986* with *J.M. Flock* (BRIT). **Limestone:** Fort Parker State Park, Jul 1993 (fr), *J. Singhurst, L. Jones, and K. Blair 1297* (BRIT). **Tarrant:** Moist sand, "1926 or 27" (fr), *Killian s.n.* (TEX). **Travis:** Austin, 19 Jul 1940 (fr), *B.C. Tharp s.n.* (TEX—2 sheets); Lake Austin, 17 Aug 1923 (fr), *R.H. Painter s.n.* (TEX).

VIRGINIA. *Specimens with flowers or both flowers and fruits.* City of Newport News, Huntington Park, 26 Sep 1989 (fl), *P. Baldwin 95* (WILLI). **Sunny:** 2 mi SE of Claremont, 16 Jul 1949 (fl), *B. Mikula 2838* (WILLI—2 sheets).

***Gonolobus suberosus* (L.) R.Br. var. *suberosus*, Asclepiadeae: 24. 1810.**

ALABAMA. *Specimens with flowers or both flowers and fruits.* [no location given beside state], [no date] (fl), *Anonymous s.n.* (ex herb. A.S. Hitchcock) (KSC). **Baldwin:** Spanish Fort, 22 May 1975 (fl), *R. Kral 55728* (TEX). **Barbour:** Vicinity of Comer, 26 May 1998 (fl), *J.R. MacDonald 11270* (UNA). **Bibb:** Ca. 9.4 mi NE of Centreville, ca. 0.5 mi W of Bulldog Bend Bridge, 7 Jun 1998 (fl), *J.R. Allison 10898* (UNA). **Blount:** 2 air mi NNW of Altoona, SW side of Co. Rd. 41, just S of jct with Co. Rd. 42, 34°3'8" N 86°20'21" W, S28 T11S R3E, 17 Jul 1998 (fl), *B.R. Keener 1257* (UNA); 1 air mi S of Summit, on NE side of lake, on SE side of 231, 34°11'35"N 86°29'35" W, S1 T10S R1E, 8 Jun 1998 (fl), *B.R. Keener 934* (UNA). **Etowah:** Gadsden, Jul 1878 (fl, fr—imm), *G.R. Vasey s.n.* (F). **Greene:** 8 air mi S of Sawyerville, 30 Jun 1966 (fl), *J.L. Thomas 832* (UNA). **Houston:** Chattahoochee State Park, near fishing pond, 5 Jun 1972 (fl), *R. Kral 47233* (FSU,

USCH); Chattahoochee State Park, 31 Jul 2003 (fl), *Krings AL-1* (NCSC); Chattahoochee State Park, 31 Jul 2003 (fl), *Krings AL-7* (NCSC). **Marengo:** 10 mi S of Demopolis, S14 T16N R2E, 30 May 1992 (fl), *D.H. Burk 106* (UNA). **Montgomery:** Hwy 30, 0.3 mi S of Sandy Creek, S 22 T14N R19E, 16 May 2001 (fl), *A.R. Diamond 12445* (MISS). **Randolph:** E bank of Tallapoosa River, S5 T18S R10E, 2 Aug 1986 (fl), *C.F. Nixon 3561* with *R.D. Whetstone, C.L. Lawler* (UNA); Along Co. Rd 33, above Cornhouse Creek, S8 T21S R11E, 28 Jul 1988 (fl, considerable insect damage), *C.F. Nixon 4151* and *G.D. Bryant* (UNA). **Wilcox:** Prairie Bluff on W shore of Alabama River, near Prairie Mission, S32 T14N R7E, 23 Jun 1982 (fl), *S.C. Gunn 842* (UNA).

Specimens with fruits only or sterile, but most likely var. suberosus based on distribution of flowering specimens (see Fig. 2). **Barbour:** Blue Springs State Park, 31 Jul 2003 (st), *Krings AL-10* (NCSC). **Houston:** Chattahoochee State Park, 31 Jul 2003 (st), *Krings AL-2* (NCSC); Chattahoochee State Park, 31 Jul 2003 (st), *Krings AL-3* (NCSC); Chattahoochee State Park, 31 Jul 2003 (st), *Krings AL-4* (NCSC); Chattahoochee State Park, 31 Jul 2003 (st), *Krings AL-5* (NCSC); Chattahoochee State Park, 31 Jul 2003 (st), *Krings AL-6* (NCSC); Chattahoochee State Park, 31 Jul 2003 (st), *Krings AL-8* (NCSC); Chattahoochee State Park, 31 Jul 2003 (st), *Krings AL-9* (NCSC). **St. Clair:** Along Little Canoe Creek, E of Lake Sumatanga, 6 Oct 1962 (fr), *P.E. Bostick 253-12* (NCU).

FLORIDA. *Specimens with flowers or both flowers and fruits.* Mosquito Inlet, June (fl), *A.H. Curtiss 2308* (F, KANU, LL, ND-G [040257], NY). **Alachua:** 22 Jun 1986 (fl), *C. Easley 367b* (FLAS); 25 Jul 1935 (fl, fr), *G.F. Weber s.n.* (FLAS); 18 Jun 1936 (fl), *O. Evers and E. West* (FLAS); *Krings FL-9* (NCSC). **Brevard:** 15 Jun 1928 (fl), *Rhoades and West s.n.* (FLAS). **Columbia:** 16 May 1992 (fl), *B. Herring 739* with *D. Herring* (FLAS); 10 May 1990 (fl), *B. Tan 620* (FLAS). **Dixie:** 12 Jun 1960 (fl), *R. West and E. West s.n.* (FLAS, NCU). **Duval:** 18 Jun 1993 (fl), *R. Stalter 13* (USF). **Franklin:** 26 Jul 1985 (fl), *L.C. Anderson 8648* (FLAS, FSU). **Gadsden:** 18 Jun 1973 (fl), *A. Gholson s.n.* (FSU); 3 Aug 1983 (fl, fr), *J.B. Nelson 2758* with *G.R. Knight* (FSU); 13 Jul 1897 (fl), *A.H. Curtiss 5948* (DOV, FLAS, ILL, KSC, USF); 22 Jun 1975 (fl), *D.B. Ward 8861* (FLAS, WILLI); 1 Jul 1965 (fl, fr—imm (FSU)), *S. McDaniel 6446* (FLAS, FSU, NY, UNA); 22 May 1959 (fl), *R.K. Godfrey 58650* (FSU). **Gulf:** 18 Jul 1986 (fl, fr—imm (FSU)), *L.C. Anderson 9802* (FSU, USF); 7 Jun 1990 (fl), *L.C. Anderson 12868* (FSU). **Hamilton:** 16 Jun 1983 (fl), *D.W. Hall 1231* with *B. Simons* (USF). **Jefferson:** 8 Jun 1974 (fl), *R.K. Godfrey 73629* (FSU). **Hernando:** May 1928 (fl), *J.K. Small s.n.* (USF). **Lake:** 16–30 Jun 1895 (fl), *G.V. Nash 1986* (F, ND-G [040255]); 1–10 Jul 1895

(fl), *G.V. Nash 2133* (DOV, F, ND-G [040254]). **Levy**: Jun 1876 (fl), *A.P. Garber s.n.* (FLAS); 11 Aug 1937 (fl), *E. West and L.E. Arnold* (FLAS); 9 Jul 1996 (fl), *J.R. Abbott 9184 with H. Mitchell, N. Makruski* (FLAS, TEX); 18 Jul 1993 (fl), *R. Moranz 3 with L. Fink* (FLAS); 21 Jun 1994 (fl), *W.S. Judd 7024* (FLAS). **Leon**: 5 Jun 1996 (fl), *L.C. Anderson 16540* (FSU). **Liberty**: 4 Jul 1972 (fl), *R.K. Godfrey 71489* (FSU); 24 Apr 1982 (fl, fr), *S.W. Leonard 7747* (FSU). **Marion**: 27 May 1941 (fl), *West and Arnold s.n.* (FLAS). **Nassau**: 4 Jul 1951 (fl), *S.C. Hood s.n.* (FLAS). **Pasco**: 8 May 1986 (fl), *T. Rochow s.n.* (USF). **Pinellas**: 3 Jun 1973 (fl), *P. Genelle and G. Fleming 1679* (USF). **Polk**: 8 Jul 1979 (fl), *D. Rhodes et al.* [additional collectors not specified on label] *s.n.* (USF). **Putnam**: 22 Jul 1941 (fl), *A.M. Laessle s.n.* (FLAS). **St. Johns**: 22 May 1904 (fl), *J.K. Small and P. Wilson s.n.* (F); 14 May 1994 (fl), *J. Harrison 685 with L. Harrison* (FLAS); 6 Jul 1940 (fl), *West and Arnold s.n.* (FLAS). **Sumter**: 24 Apr 1992 (fl), *C. vanHoek 261* (holotype: USF). **Suwannee**: 18 Jul 1967 (fl), *S. McDaniel 9449* (FLAS, FSU). **Volusia**: 13 Jun 1941 (fl), *E.L. Brasol s.n.* (FLAS). **Washington**: 13 Jul 1969 (fl), *R.K. Godfrey 68758* (FSU); 24 May 1990 (fl), *L.C. Anderson 12760* (FSU).

Specimens with fruits only or sterile, but most likely var. suberosus based on distribution of flowering specimens (see Fig. 2). **Alachua**: 17 Apr 1986 (st), *W.S. Judd 5093* (FLAS). **Calhoun**: 9 Sep 1958 (fr), *R.K. Godfrey 57724* (FSU). **Columbia**: 29 Jul 2003 (st), *Krings FL-10* (NCSC); 29 Jul 2003 (st), *Krings FL-11* (FLAS). **Dixie**: 18 Sep 1960 (st), *D.W. Ward and A.A. Will 2208* (FSU). **Duval**: 15 Sep 1992 (st, but peduncle persistent), *C. Easley 1192* (FLAS). **Gadsden**: “11-6-87” (fr, no lvs), *P.W. Alcorn 366* (FLAS); 15 Oct 1972 (st), *D.B. Ward 8410 with D.W. Hall, N.E. Lee* (FLAS); 15 Oct 1972 (st), *D.B. Ward 8453* (FLAS). **Glades**: 27 Jan 1962 (st), *D.W. Ward 2428 with T. Myint, R.R. Smith* (FLAS). **Hernando**: 18 May 1965 (st), *D.B. Ward 4706 with J. Beckner* (FLAS). **Hillsborough**: 28 Jul 2003 (st), *Krings FL-6* (NCSC); 28 Jul 2003 (st), *Krings FL-7* (FLAS); 28 Jul 2003 (st), *Krings FL-8* (FLAS). **Jackson**: 25 Jun 1960 (st), *R.S. Mitchell 338* (FSU); 29 Jul 1960 (st), *R.S. Mitchell 463* (FSU); 23 Jun 1975 (st), *D.B. Ward 8928* (FLAS); 1 Aug 2003 (st), *Krings FL-13* (NCSC); 1 Aug 2003 (st), *Krings FL-14* (FLAS). **Lee**: Jun–Jul 1898 (st), *A.S. Hitchcock s.n.* (F). **Liberty**: 17 Jul 2001 (fr), *L.C. Anderson 19833* (FSU). **Marion**: 24 Sep 1941 (fr), *West and Arnold s.n.* (FLAS). **Orange**: 27 Jul 2003 (st), *Krings FL-1* (NCSC); 27 Jul 2003 (st), *Krings FL-2* (NCSC); 27 Jul 2003 (st), *Krings FL-3* (NCSC); 27 Jul 2003 (st), *Krings FL-4* (FLAS); 27 Jul 2003 (st), *Krings FL-5* (FLAS). **Polk**: 24 Dec 1965 (st), *H.S. Conard s.n.* (FLAS). **Seminole**: 16 Feb 1965 (st), *D.B. Ward 4382 with J. Beckner* (FLAS). **Wakulla**: 1 Aug 2003 (st), *Krings FL-15* (NCSC); 1 Aug 2003 (st), *Krings FL-16* (FLAS).

GEORGIA. *Specimens with flowers or both flowers and fruits.* [no locality], [no date] (fl), *Anonymous s.n.* (F). **Baker**: Ichauway (former plantation, maintained as a natural ecosystem SW of Newton, ca. 28 mi SW of Albany), 18 May 1996 (fl), *L.C. Anderson 16407* (FSU, GA); Along W bluffs of Flint River near jct with Ichawaynochawa Creek, 26 Jul 1946 (fl), *W.H. Duncan 6640* (GA); Along Flint River near its jct with Ichawaynochaway Creek, 30 Jul 1947 (fl), *R.F. Thorne 5806* (FSU). **Bryan**: Fort Stewart Military Reservation, Training Area C16, 4 Jun 1992 (fl), *T.M. Zebryk 0350 with M. Moore, D. Giannasi* (GA). **Butts**: SE of Jackson, off Ga. Hwy 42, 4 Jul 1988 (fl), *C.L. Howel 1531* (GA, KANU). **Cherokee**: Little River Area, 14 Jul 1988 (fl), *S.B. Jones 24980 with C. Jones, L. Foote, G. Foote* (GA). **Clay**: Chattahoochee River bluff, Fort Gaines, 31 May 1947 (fl), *R.F. Thorne 4334* (F); Ca. 3 mi SSE of Fort Gaines, 29 May 1988 (fl), *J.R. Allison 3203* (GA). **Columbia**: Bank of Savannah River, German’s Island, 7 Jun 1902 (fl), *R.M. Harper 1298* (F). **Dade**: Lower end of Sitton’s Gulch, 6 Jun 1942 (fl, fr), *W.H. Duncan 5446* (GA). **Decatur**: Ca. 100 m SE of the workshop at Jim Woodruff Dam N of Chattahoochee, Florida, 5 Jun 1964 (fl), *D. Drapalik M454* (NCU). **Elbert**: Richard B. Russell Dam and Lake Area, 20 Jun 1979 (fl), *W.C. Credle 935* (GA). **Floyd**: Hillside on S side of Catoona River, ca. 3 mi SW of Rome, 26 Jun 1948 (fl, fr), *W.H. Duncan 8448* (GA); SW of Rome, along Coosa River, 12 Jul 1984 (fl), *S.B. Jones 24340 with N.C. Coile* (USCH). **Glynn**: St. Simon’s Island, 16 Jun 1970 (fl), *R. B. McGhee 36* (GA). **Gordon**: New Echota Historic Site, 14 Jun 1998 (fl – heavy insect damage), *C.L. Howel 2210* (GA). **Harris**: Along Mulberry Creek, 1.5 mi SSE of Mountain High School toward Mulberry Grove on Mt. Hill Road, 12 Jun 1972 (fl), *S.B. Jones 22109 with V. Jones* (GA). **Johnson**: Harrison property, 11 Jun 1994 (fl – heavy insect damage), *J.O. Harrison 154-B* (GA). **McDuffie**: Clark Hill Wildlife Management Area, 4 Jun 1982 (fl – imm), *N.C. Coile 2853 with L. Kay, K. Boring* (UMO). **Macon**: Above E bank of Flint River, N of public boat ramp at W end of Co. Rte. 267, 11 Jun 1988 (fl), *J.R. Allison 3244 with T.S. Patrick* (GA); Slopes above Beaver Creek, 100 ft N of owerline [sic], 1000 ft E of Glorious Hope Cemetery, 17 May 1990 (fl), *L.G. Chafin 2001* (GA). **Quitman**: Ca. 1.5 mi NNE of Georgetown, 30 May 1988 (fl), *J.R. Allison 3207* (GA). **Stephens**: By Panther Creek, 22 Jun 1962 (fl), *C.H. Fitzgerald s.n.* (GA). **Thomas**: Greenwood Plantation youth camp, just E of Ochlockonee River, off hwy 84 at Old Cassidy Road, 4 mi W of Thomasville, 21 May 1977 (fl), *L.C. Anderson 4456* (FSU). **Whitfield**: Creek on E side of W. Chickamauga Creek, 3.1 mi W 11°N of Ft. Oglethorpe, elev. 670 ft., 18 Aug 1951 (fl), *W.H. Duncan 13043 with H. Venard* (GA). **Wilkes**: Anthony Shoals on the Broad River, 11.5 mi NE of Tignall, 8 Jul 1973 (fl), *S.B. Jones 22475 with O. Bounds, L. Bounds, C. Jones* (DUKE).

Specimens with fruits only or sterile, but most likely var. suberosus based on distribution of flowering specimens (see Fig. 2). **Baker:** Bank of Flint River, 4 mi E of Field Station, 14 Oct 1947 (st), *R.F. Thorne 7238a* (GA). **Cherokee:** Allatoona Lake shore, 7 Sep 1988 (fr), *L. Foote s.n.* (GA). **Glynn:** 0.3 mi thru [sic] swamp NNE of end of Point Road (Union Camp) off Prick Road, 13 Oct 1992 (st), *C. Nordman s.n.* (GA); Union Camp, Brunswick, 24 Aug 1992 (st), *C. Nordman s.n.* (GA). **Harris:** Callaway Gardens, 15 Jul 1999 (fl – heavy insect damage), *Crook 436 with D.E. Giannasi* (GA); Callaway Gardens, 21 Oct 1998 (fr), *D. Giannasi 1998-99 with M. Zimmerman* (GA). **Lincoln:** SW side of Savannah River, ca. 3 mi above jct with Little River and just opposite lower end of Price's Island, 29 Jun 1949 (fr—imm), *W.H. Duncan 9825* (GA). **Long:** S side of Carters Island, near Altamaha River, "6/4/93" (st), *C. Nordman and K. Tassin s.n.* (GA). **Monroe:** High Falls State Park, 27 Jun 1987 (st), *C.L. Howel 0421* (GA).

KENTUCKY. *Specimens with flowers or both flowers and fruits.* **Jessamine:** Dug from High Bridge, 230 m N of the dance hall in High Bridge Park, transplanted to Botanical Garden plots at the Univ. North Carolina, Orange Co., NC, 19 Jun 1963 (fl), *D.J. Drapalik M315* (FLAS).

LOUISIANA. *Specimens with flowers or both flowers and fruits.* **Orleans:** Swamps, New Orleans, May [no year on label] (fl), *R.S. Cocks s.n.* (NO).

MISSISSIPPI. *Specimens with flowers or both flowers and fruits.* **Wayne:** Bluff of Chickasawhay River, ca. 2.5 mi NW of Waynesboro, S35 T6N R9W, 13 Jun 1969 (fl), *S.B. Jones 16348* (MISS).

NORTH CAROLINA. *Specimens with flowers or both flowers and fruits.* **Alamance:** Riverbottom along Haw River, ca. 5 mi SE of Saxapahaw, 17 Jul 1956 (fl), *C.R. Bell 4080* (NCU); Austin Quarter, along small stream about 500 m W of confluence of Orange County's Cane Creek and Haw River, 35°54'46" N, 79°16'26" W, 30 Jul 2005 (fl), *C.A. McCormick 150 with M. Peifer* (NCU – 3 sheets). **Anson:** Blewett Falls on Pee Dee River, 30 Jun 1956 (fl), *A.E. Radford 13383* (NCU). **Beaufort:** Indian Island, 9 Jun 1966 (fl), *A.E. Blair 538* (NCSC). **Carteret:** Lenox Point, 3 mi E of Beaufort, 27 Jul 1954 (fl, fr), *R.K. Godfrey s.n.* (DUKE); 1 mi W of Atlantic Beach, top of front dune, 15 Jun 1947 (fl), *L.A. Whitford s.n.* (NCSC). **Chatham:** Low cleared area just W of Cumnock bridge, 5 Jul 1955 (fl), *D.F. Houck 328* (NCU); W bank of Haw River at Co. Rte. 1545 bridge, 27 Jul 1971 (fl), *S.W. Leonard 4926* (DOV, FLAS, KANU, PUL [52408], SMS, SIU, TEX, WILLI, WNC [6612], WVA); White Pines Natural Area, Rocky River floodplain, 25

Jun 1988 (fl), *E.C. Swab 334* (USCH). **Davidson:** Stream side, 2.8 mi NW of Snider, 26 Aug 1962 (fl), *H.E. Ahles 57441* (NCU). **Granville:** Northside Database area, SW of Will Suit Road, 13 Jun 2004 (fl), *A. Walker s.n.* (NCSC). **Durham:** Along Norfolk and Western tracks by Eno River, ca. 6 mi NW of Durham, 21 Jun 1968 (fl), *R.L. Wilbur 10434* (DUKE). **Guilford:** Near Conoho Creek, off Co. Rd. 125 (1417?), ca. 4.5 mi NW of Williamston (SE of bridge), 7 Feb 1960 (fl), *C.R. Bell 17051* (NCU). **Halifax:** 2 mi N of Thelma along Roanoke River, 19 Jul 1956 (fl), *H.E. Ahles 17000 with R.S. Leisner* (NCU). **Johnston:** Middle Creek, 2.3 mi WNW of Edmundson, 19 Jun 1957 (fl), *A.E. Radford 25381* (NCU). **Jones:** Island Creek, 5 mi NE of Pollocksville, 6 Jun 1965 (fl), *M.N. Sears C274* (NCU); Island Creek, E of jct of Trent River and Island Creek, 5 mi NE of Pollocksville, 6 Jun 1965 (fl), *M.N. Sears C315* (NCU). **Jones/Onslow:** Croatan National Forest, Jun 1979 (fl), *C. Stone 243* (NY). **Lee:** 1 mi W Moncure at US Hwy 1 bridge on Deep River, 28 Jul 1955 (fl), *L.S. Beard 1059* (NCU). **Lenoir:** Neuse River, 2.5 mi E of Seven Springs, 22 Jun 1957 (fl), *A.E. Radford 25712* (FSU, NCU). **Mecklenburg:** 7 mi W of Huntersville, along Catawba River, 6 Aug 1958 (fl), *H.E. Ahles 48676 with J.A. Duke* (NCU); 2.7 mi SE of Davidson on NC 73, 6 Aug 1958 (fl), *H.E. Ahles 48688 with J.A. Duke* (NCU); NC 73 at Davidson Branch of W Fork of Rocky River, a short distance SE of jct with Co. Rd. 2420, Westmoreland farm, 15 Jul 1967 (fl), *T. Dagg 4069* (DUKE). **Montgomery:** Little River near NC 27, E of Troy, 24 Jun 1956 (fl), *A.E. Radford 13294* (NCU). **Nash:** Tar River, 0.8 mi N of Strickland Cross Roads, 12 Jul 1956 (fl), *H.E. Ahles 16673 with C.R. Bell* (NCU, FSU, USF). **Onslow:** Bear Island or Hammock Beach State Park, 29 Jun 1961 (fl), *R.L. Wilbur and E.O. Beal 6456* (DUKE); NC 210 N of Surf City, 29 Jun 1963 (fl), *A. McCrary 548 with H. Ahles, T. Bradley* (NCU). **Orange:** near Cates' on the Eno River, 12 Aug 1972 (fl), *L.F. Conder 180 with C.R. Broome, R. Foster, M.F. Conde* (DUKE). **Pender:** Ca. 2 mi NE of Annandale, off US 17, 30 Jun 1963 (fl), *T. Bradley 1013 with Ahles, McCrary* (NCU). **Richmond:** Mountain Creek near Pee Dee River, NW of Rockingham, 24 Jul 1956 (fl), *A.E. Radford 14479* (NCU). **Robeson:** Dry river slope 1 mi SE of Lumberton along US 74 and Lumber River, 21 Jun 1958 (fl), *R.F. Britt 2135* (NCU). **Union:** Alluvial woods, 3.6 mi S of New Salem on NC 205 along Richardson Creek, 14 Jul 1957 (fl), *H.E. Ahles 31460 with J. Haesloop* (NCU); Rocky River on NC 205, N of New Salem, 14 Jul 1957 (fl), *H.E. Ahles 31482 with J. Haesloop* (NCU, USF). **Wake:** Raleigh, Lake Johnson, 13 Jul 1938 (fl), *R.K. Godfrey 5015* (NCSC); Raleigh, Schenck Forest, Jul 2001 (fl), *A. Krings 416* (NCSC); Raleigh, Schenck Forest, 6 Oct 2001 (fr), *A. Krings 418* (NCSC).

Specimens with fruits only or sterile, but most likely var. suberosus based on distribution of flowering specimens (see Fig. 2). **Alamance:** E side of first small creek upstream of the confluence of Orange County's Cane Creek and the Haw River, 30 Jul 2005 (st), *C.A. McCormick 149 with M. Peifer* (NCU). **Bertie:** NNE of Williamston, US 13 and 17, 30 Sep 1966 (fr), *D.R. Windler 1839* (SIU); N of Williamston, along the Roanoke River, 30 Sep 1966 (st), *D.M. Dumond 495* (NCSC). **Carteret:** Lennox Point, 3 mi E of Beaufort, 29 Jul 1952 (st), *H.L. Blomquist 15566* (DUKE). **Chatham:** N side of the Haw River on NC 15 and 501, 29 Oct 1956 (fr), *G.S. Ramseur 2826 with A.E. Hammond* (NCU). **Craven:** Trent River, opposite New Bern, 19 Oct 1952 (fr), *E.D. Cappel and W.B. Fox 472* (NCSC). **Hyde:** Woods beside Pungo River, 9 Oct 1965 (st), *E.G. Batts s.n.* (NCU). **Lee:** 1 mi W Moncure at US Hwy 1 bridge on Deep River, 7 Jul 1955 (st), *L.S. Beard 761* (NCU). **Madison:** 3.1 mi NW of Hot Springs, on N side of French Broad River, 8 Oct 1958 (fr), *H.E. Ahles 50647 with J.A. Duke* (NCU). **Mecklenburg:** 2.7 mi SE of Davidson on NC 73, 6 Aug 1958 (fr), *H.E. Ahles 48688 with J.A. Duke* (NCU). **Moore:** By McLendons Creek, 11 Mar 1956 (fr—remnant), *D.F. Houck 880* (NCU). **Northampton:** 3.1 mi W of Boones Crossroads, vic. of Roanoke River, 30 Oct 1958 (fr), *H.E. Ahles 52470 with J.G. Haesloop* (NCU). **Onslow:** Bear Island or Hammock Beach State Park, 5 Sep 1962 (fr), *R.L. Wilbur and E.O. Beal 6519* (DUKE). **Orange:** Swamp of New Hope Creek, 1 Aug 1937 (fr), *H.R. Totten s.n.* (NCU); Mason Farm Biological Reserve, 1 Oct 1991 (fr), *J. Larke 2172* (NCU). **Stanly:** 2.2 mi W of Aquadale on Long Creek, 24 Sep 1956 (fr), *H.E. Ahles 19926 with R.S. Leisner* (NCU). **Wake:** Neuse River, near Bayleaf, Barton's Creek Township, 4 Aug 1944 (fr), *M.F. Buell 44019* (NCSC).

SOUTH CAROLINA. *Specimens with flowers or both flowers and fruits.* **Aiken:** N Augusta along the Savannah River, 10 Jun 1962 (fl), *H.E. Ahles 56873 with R. Baird* (NCU). **Beaufort:** Bluffton, [no date] (fl), *Mellichamp s.n.* (F); [No locality provided], 1882 (fl), *Mellichamp s.n.* (DOV, F); Bluffton, Jul 1877 (fl), *Mellichamp s.n.* (NCU); Airfields, Bluffton, 1878 (fl), *Mellichamp s.n.* (NCSC); Bluffton, 1887 (fl), *Mellichamp s.n.* (ND-G [040256]); 0.4 mi WNW of Old Hilton Head Ferry landing on Co. Rt. 39, E of Bluffton, 28 Jun 1956 (fl, st), *H.E. Ahles 15633 with C.R. Bell* (NCU – 2 sheets); Sea Pines, 5 Jun 1993 (fl), *R. Stalter 7* (USF). **Berkeley:** Francis Marion National Forest, 24 May 1974 (fl), *L.R. Phillippe 2832* (EIU); Old Santee Canal State Park, 2 Jun 1988 (fl), *D. Soblo 1835* (USCH). **Edgefield:** Sumter National Forest, 20 Jun 1993 (fl), *S.R. Hill 25130 with B. Dorsey* (USF); Sumter National Forest, Compartment 322, Stand 2, elev. ca. 250 ft, 30 May 1997 (fl), *J.B. Nelson 18333* (USCH). **Fairfield:** Near railroad station, Stro-

ther, 20 Jun 1956 (fl), *O.M. Freeman 56367* (NCU); Roadside thicket at Shelton, 21 Jun 1956 (fl), *O.M. Freeman 56412* (NCU); Ca. 3.5 mi SE of Jenkinsville, 34.2236°N, 81.2438°W, elev. 330 ft., 26 Jun 2002 (fl), *J.B. Nelson 22832* (NCSC); Ca. 900 m ESE of main reactor, V.C. Summer Nuclear Station, NW side of Jenkinsville off SC 215, UTM 17 471672E 3794415N, elev. ca. 370 ft., 31 May 2002 (fl), *J.B. Nelson with S. Summer, M. Whitten* (NCSC). **Georgetown:** Tom Yawkey Wildlife Center, just W of 'Five Points,' South Island, 23 May 1991 (fl), *J.B. Nelson 10483 with D.E. Kennemore* (FLAS, NCU, USCH); Prince George Tract, just S of Pawley's Island, ca. 7 mi NE of Georgetown, 14 Jun 1996 (fl), *B. Seckinger 169* (USCH). **Greenwood:** Henley Creek, near SC 248, 2.6 mi S of Ninety Six, 1 Jul 1957 (fl, fr—imm), *A.E. Radford 26569* (NCU); Wilson Creek, near SC 246, 1.5 mi N of Ninety Six, 7 Jul 1957 (fl), *A.E. Radford 26588* (NCU); SC 248, just S of Ninety Six Creek crossing, Ninety Six, 24 Jun 1987 (fl), *S.R. Hill 18134 with C.N. Horn* (NCU, NY, USF—2 sheets); Sumter National Forest, E side of Hard Labor Cr, about a mile downstream from Cunning Ford Cr, 27 Jun 1989 (fl), *J.B. Nelson 8088 with S. Bennett* (USCH). **Hampton:** Hamilton ridge, floodplain of the Savannah River, 1 Jun 2000 (fl), *A.B. Pittman 06010015 and A.R. Darr 590* (USCH); Hamilton ridge, floodplain of the Savannah River, 1 Jun 2000 (fl), *A.B. Pittman 06010024 and A.R. Darr 589* (USCH). **Horry:** Low woods near Myrtle Beach, 13 Jul 1932 (fl), *W.C. Coker and H.R. Totten s.n.* (NCU). **Kershaw:** Near Miller Bridge over Lynchess River, 11 mi NE of Kershaw, 4 Jun 1957 (fl), *A.E. Radford 23665* (NCU). **Lancaster:** Near Rocky Creek, 3 mi S of jct. SC 97 and Co. 20 on SC 97 (SW corner of county), 6 Jun 1957 (fl), *H.E. Ahles 27370 with J.G. Haesloop* (NCU); Flat Creek, ca. 8 mi NE of Kershaw, 16 Jul 1961 (fl), *B.F. Williamson 1398* (NCU). **Laurens:** SC 56 at Enoree River, ca. 12 mi NE of Laurens, 2 Jul 1988 (fl), *C.N. Horn 2814* (USCH). **Lexington:** 31 May 1891 (fl), *Anonymous s.n.* (NCU). **Marlboro:** Pee Dee River, 9 mi SW of Bennettsville, 10 Aug 1956 (fl), *A.E. Radford 15492* (NCU); Boat landing next to bridge, US 15 just N of Great Pee Dee River, 22 Jul 1989 (fl), *C.N. Horn 3527* (USCH). **McCormick:** SC 823 at Little River, ca. 13 mi NW of McCormick, 17 Jul 1993 (fl), *C.N. Horn 7219* (USCH); Sumter National Forest, edge of clearcut on E side of Persimmon Br, 34.0199 N 82.3764 W, elev. 370 ft, 8 Jun 2000 (fl), *J.B. Nelson 21297* (USCH). **Newberry:** County Rt 28, 0.5 mi S SC 213 at creek and railroad tressel, ca. 16 mi E of Newberry, 2 Jun 1987 (fl), *C.N. Horn 1848* (USCH); Newberry County 403 at tributary to Camping Creek, 2 Jul 1987 (fl), *C.N. Horn 2116* (USCH); Lynch's Woods Park, E of downtown Newberry, 25 Jun 1989 (fl), *C.N. Horn 3459* (USCH); Forest Service Compartment 173, S of Sumter National Forest Road 380 at Joshuas Branch,

26 Jun 1993 (fl), *C.N. Horn 6993* (USCH). **Saluda:** Big Creek, near SC 194, 6.5 mi NE of Saluda, 8 Jul 1957 (fl), *A.E. Radford 26930* (NCU). **Union:** At bridge over Fair Forest Creek, SW of Jonesville, 5 Jun 1957 (fl), *C.R. Bell 8525* (NCU); Sumter National Forest, 7 Jul 1994 (fl), *S.R. Hill 25893* (NY); Sumter National Forest, Rosehill Boat Ramp, 18 Jul 1992 (fl), *C.N. Horn 5393* (USCH); Forest Service Compartment 101, ca. 15 mi S of Union, 12 Jul 1993 (fl), *C.N. Horn 7155* (USCH); Headwaters of John's Cr S of S-18, about 2 mi W of downtown Sedalia, 22 Jun 1989 (fl), *J.B. Nelson 8044 with O. Stuart, A. Schkenck* (USCH). **York:** Kings Mountain State Park, Lake York camping area near the dam, elev. 675 ft, 8 Jun 1993 (fl), *D.E. Kennemore, Jr. 531* (USCH); Woods at terminus of Hemlock Rd off Porter Rd, S side of Rock Hill, 23 Jun 1988 (fl), *J.B. Nelson 6727* (DUKE, USCH); near edge of Stony Fork Cr, on N side of SC 324, 29 Jul 1988 (st), *J.B. Nelson 6809 with R. Greenburg* (USCH).

Specimens with fruits only or sterile, but most likely var. suberosus based on distribution of flowering specimens (see Fig. 2). **Aiken:** N Augusta near Savannah River, 27 Oct 1961 (fr), *H.E. Ahles 55121 with P.J. Crutchfield* (NCU – 3 sheets). **Allendale:** Savannah River, 1.4 mi SW of jct. Co. Rt. 60 and 41, 11 Sep 1956 (fr), *H.E. Ahles 18446 with C.R. Bell* (NCU). **Beaufort:** Beaufort District, [no date] (st), *Mellichamp s.n.* (F). **Charleston:** 3.8 mi SW of Hollywood on SC 162, 21 Jul 1957 (st, peduncles persistent), *H.E. Ahles 32055 with R.S. Leisner* (NCU). **Cherokee:** 1 mi N of jct. SC 18 and Co. 98 along Broad River (NW of Blackburg), 11 Jul 1957 (fr), *H.A. Ahles 30953 with J.G. Haesloop* (NCU). **Darlington:** Woods at Lauther's Lake, 23 Jul 1939 (fr), *B.E. Smith 1155* (NCU); Woods near Lauther's Lake, 25 Aug 1941 (st), *B.E. Smith 2040* (NCU). **Georgetown:** Tom Yawkey Wildlife Center, South Island, 3 Oct 1990 (fr), *J.B. Nelson 9805* (USCH). **Lancaster:** Andrew Jackson State Park, 22 Jul 2003 (st), *Krings SC-1* (NCSC). Andrew Jackson State Park, 22 Jul 2003 (st), *Krings SC-2* (NCSC). **Newberry:** 1.3 mi W of Chappells, 16 Sep 1957 (fr), *C.R. Bell 9846* (NCU). **Oconee:** Chauga River, ca. 0.25 mi downstream from the junction of forest service route 748-D with the Chauga River, 17 Oct 1986 (fr), *J.D. Tobe 1442* (ILL). **Richland:** Congaree Swamp National Monument, 2.1 river mi downstream from boat landing at upstream boundary of CSNM, elev. ca. 100 ft, 26 Oct 1998 (fr), *J.B. Nelson 20224 with J.E. Cely, A. Thompson, H. Steele* (USCH); Old pasture on W side of S.C. 215, at Cedar Creek, 13 Aug 1979 (fr), *J.B. Nelson 1290* (FSU). **York:** Bullocks Creek on SC 907 (SW of Sharon), 19 Sep 1957 (fr), *H.E. Ahles 34604* (NCU).

TENNESSEE. *Specimens with flowers or both flowers and fruits.* **DeKalb:** Edgar Evins State Park, 36°03'53.3"N

85°47'18.2"W, 1 Jul 2002 (fl), *L.R. Phillippe 34311* (ILLS). **Hamilton:** Harrison Bay State Park, 23 Jul 2003 (fl), *Krings TN-1* (NCSC); Harrison Bay State Park, 23 Jul 2003 (fl, fr), *Krings TN-2* (NCSC); Harrison Bay State Park, 23 Jul 2003 (fl), *Krings TN-3* (NCSC); Harrison Bay State Park, 23 Jul 2003 (fl), *Krings TN-5* (FLAS, NCSC). **Knox:** Tennessee River bank, Cherokee farm, 12 Jul 1922 (fl), *A.R. Bechtel 10970* (NY); Along Northshore Dr., ca. 0.4 mi W of Ebenezer Road, 30 Jun 1989 (fl), *V.E. McNeilus 89-439* (TENN); Old Sevierville Pike, 20 Jun 1938 (fl), *A.J. Sharp 236* (TENN); Between Hardin Valley and Clinch River, 1 Jul 1958 (fl), *A.J. Sharp 24903* (TENN); Limestone barrens near Mascot, 11 Jul 1958 (fl), *A.J. Sharp 24927* (TENN); Limestone barrens near Mascot, 11 Jul 1958 (fl), *A.J. Sharp 24929* (TENN). **Marion:** Along river below Hales Bar Dam, 16 Jun 1948 (fl), *S. Fairchild, E. Clebsch, and A.J. Sharp 48-74* (TENN).

VIRGINIA. *Specimens with flowers or both flowers and fruits.* **City of Hampton:** Langley Research & Development Park, 5 Jul 1994 (fl), *P. Baldwin 601* (WILLI). **Charles City:** Bank of Chickahominy River, S of bridge, 5 Jul 1949 (fl), *B. Mikula 2303* (FLAS, WILLI). **Chesterfield:** Presquile, 24 Jun 1970 (fl), *M.F. Johnson 3375* (WILLI). **Gloucester:** "Catbird" Creek, off Carter's Creek, on Rosewell property, 2 Jul 1975 (fl), *J.M. Greaves 486 with P.H. Wilson* (FLAS, WILLI); Kenney Building at Bote-tourt Elementary School in Gloucester GH, 17 Jun 1977 (fl), *J.M. Greaves 1816* (WILLI); Along Rt. 602, just N of James Store P.O., 9 Jul 1975 (fl), *J.M. Greaves 555* (WILLI). **Greensville:** 1 mi NW of Dahlia, 15 Jul 1949 (fl), *B. Mikula 2766* (WILLI); Ca. 1 mi N of St. Rt. 621 and 3.25 mi W of Skippers, elev. 140 ft., 27 Jun 1984 (fl), *T.F. Wieboldt 5135 with A. Wieboldt* (WILLI, WVA). **James City:** Jamestown Island, 14 Jul 1969 (fl), *L.E. Loetterle 188* (WILLI). **Powhatan:** 0.25 mi S of the James River, 1 mi E of Fine Creek, 28 Jun 1976 (fl), *C.M. Corcoran 744 with G.M. Diggs, Jr.* (WILLI). **Surry:** Hog Island Waterfowl Refuge, 3 Aug 1974 (fl), *D.M. Eggers Ware 5662a* (WILLI). **Sussex:** Along Nottoway River, SW of Homeville, 18 and 19 Jun 1939 (fl), *M.L. Fernald and B. Long 10399* (F). **York:** Ca. 0.25 mi S of Bellfield Plantation site, on S side of Yorktown Colonial Pkwy, 20 Jul 1971 (fl), *E.D. Sallé 432* (WILLI); Ca. 0.5 mi E of entrance to Ringfield picnic area, on S side of Yorktown Colonial Pkwy, 26 Jul 1971 (fl), *E.D. Sallé 465* (WILLI); Ca. 0.5 mi E of Bellfield Plantation site, on S side of Yorktown Colonial Pkwy, 28 Jul 1971 (fl, fr), *E.D. Sallé 485* (WILLI); Cheatham Annex Naval Supply Center, across from Cabin 261 near Cheatham Pond, 8 Jul 1975 (fl), *K. Kirkman 268* (FLAS, WILLI).

Specimens with fruits only or sterile, but most likely var. suberosus based on distribution of flowering specimens (see Fig. 2). **Albemarle:** Monticello, elev. 830 ft., "12-8-80" (fr),

T.F. Wieboldt M-702 (WILLI). **Charles City:** Old Neck, Co. Rt. 627, NE of Mt. Airy, 31 Mar 1971 (fr), *D.M. Eggers Ware 3485* (WILLI). **Gloucester:** Rosewell site, 3 Oct 199? (fr), *J.H. Brown 821* (WILLI). **Goochland:** On Rt. 6, near Manakin, 24 Oct 1969 (fr), *M.F. Johnson 3041* (WILLI). **Isle of Wight:** Mogarts Beach, 18 Sep 1979 (fr), *L.L. Whitmarsh and D.M.E. Ware 669* (WILLI). **James City:** Jamestown Island, 5 Nov 1969 (fr), *L.E. Loetterle 594* (WILLI). **Prince Edward:** Buffalo River, W of Farmville on US 460, 16 Oct 1965 (fr), *H.E. Ahles 62973 with F. James* (NCU). **York:** Cheatham Annex Naval Supply Center, near Patrol Rd 1, 24 Oct 1975 (fr), *K. Kirkman 839 with G. Roe* (WILLI).

Specimens sterile, with immature flowers, or only with fruits that could not be referred confidently to variety based on morphological characters or locality

MISSISSIPPI. **Jackson:** Along Pascagoula River at Long Point, 15 Nov 1952 (fr), *R.L. Diener 781* (ILL). **Perry:** Ragland Hills, 15 Jul 1970 (fr – imm), *K.E. Rogers 3756 with R. Watson* (NCU); Pearce Creek, SE of For-

est Service Road 311, opposite Road 311A in Camp Shelby Training Area 24, S4 T2N R11W, 22 Jul 1996 (fr), *S.W. Leonard 9577* (NCU – 2 sheets).

TENNESSEE. **Anderson:** Melton Hill Reservoir, 28 Jun 1961 (fl—imm), *W.H. Ellis 28829* (TENN). **Blount:** Great Smokey Mountains National Park, Tabcat Creek Watershed, 35.52097°N –83.98019°W, 7 Oct 2002 (fr), *D.T. Busemeyer, C. Carrol, M.A. Feist, R.L. Larimore, P.B. Marcum, L.R. Phillipe, and G. Spireas 1167* (ILLS); Beside US129, 5 mi N of Talassee, 17 Sep 1964 (fr), *R.D. Thomas s.n.* (TENN); Beside US129, 5 mi N of Talassee, 17 Sep 1964 (fr), *R.D. Thomas 33258* (TENN). **Hamilton:** Behind the Tennessee Welcome Center along I-75, 26 Sep 1996 (fr), *V.E. McNeilus 96-1041* (TENN). **Knox:** Bank Tennessee River, near asylum, 17 Aug 1921 (fr), *A.R. Bechtel 10971*(NY); Melton Hill Reservoir, 2 Aug 1961 (st), *W.H. Ellis 28894* (TENN); West Knoxville, 3 Nov 1941 (fr), *A.J. Sharp 1696* (TENN—2 sheets); Near Little Creek, 11 Nov 1962 (fr), *A.J. Sharp 30914* (TENN). **Marion:** Road up Big Fiery Gizzard Cove, 21 Aug “19380” (fr), *T.S. Patrick and M.E. Medley 1399* (TENN). **Washington:** Near Nolichucky River, Lamar community, 10 Oct 1953 (fr), *R.L. James 18244* (TENN).

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