SYNOPSIS OF THE WOODY SPECIES OF *SMILAX* IN THE EASTERN UNITED STATES NORTH OF PENINSULAR FLORIDA

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Abstract: The nine woody species of *Smilax* (*S. auriculata*, *S. bona-nox*, *S. glauca*, *S. laurifolia*, *S. pumila*, *S. rotundifolia*, *S. smallii*, *S. tamnoides*, and *S. walteri*) of the eastern United States north of peninsular Florida are described through the use of charts. The habitat, range, common names, and synonyms for each are listed. A key to the nine species is provided.

Key Words: *Smallii*; key; chart; species.

INTRODUCTION

The genus *Smilax* L. includes herbaceous species (Section *Coprosmanthus* (Torrey) Benth syn = *Nemexia* (Rafenisque) A. de Candolle) and woody species (Section *Smilax*). The genus was traditionally included in the Liliaceae but is now in its own family, Smilacaceae. In the eastern United States, the genus *Smilax* includes nine woody species; *S. auriculata* Walter, *S. bona-nox* L., *S. glauca* Walter, *S. laurifolia* L., *S. pumila* Walter, *S. rotundifolia* L., *S. smallii* Morong, *S. tamnoides* L., and *S. walteri* Pursh. We recognize these nine species plus two varieties of *S. bona-nox*; var. *bona-nox* and var. *littorale* Coker.

All species of *Smilax* are included by Holmes (2002) in the Flora of North America treatment (Flora of North America Editorial Committee 2002). All woody species of *Smilax* were covered by Coker (1944) and the woody species of the southeastern United States by Duncan (1967). All *Smilax* species were included in Judd's 1998, treatment of the Smilacaceae in the southeastern United States. Diggs et al. (2006) included all but *S. auriculata* in their work on monocots of east Texas and Allen et al. (2002) included all nine species in their work on woody plants of Louisiana. All nine species within the range is available on-line from the USDA Plant Database (USDA NRCS 2011). Yates and Duncan (1970) included all the woody species of *Smilax* except for *S. pumila* in their leaf anatomical work. Other anatomical works include Arber (1920); Caponetti and Quimby (1956); and Martin and Tucker (1985). Our data are based on the aforementioned publications plus field observations by both authors for more than 30 yrs. and from notes taken from living specimens in the Bullard garden in North Carolina. This paper presents: (1) unreported observations, (2) brings together published data, (3) a key, charts, and descriptions to facilitate the

identification of the woody species of the genus *Smilax* in the eastern United States north of peninsular Florida.

DESCRIPTION OF *SMILAX* SECTION *SMILAX*

Perennial, woody vines or rarely shrubs; rhizomes tuberous or stoloniferous; roots filiform. Stems climbing via tendrils, or rarely sprawling, simple or branching, armed with prickles, rarely unarmed. Leaves deciduous to evergreen, alternate; stipules present, modified to form tendrils; tendrils, paired, originating from petioles; blades linear, oblong, or ovate, base sometimes lobed. Inflorescences umbellate, axillary to leaves, loose to dense, pedunculate. Flowers unisexual; tepals 6, greenish, yellow, or bronze, ovate to elliptic; staminate flowers sometimes with pistillode, stamens 6, anthers basifixed, dehiscence introrse; pistillate flowers with 6 staminodes, style short or absent, stigmas 3, recurved, ligulate. Fruits are berries. Berries black, blue, purple, red, or orange. x = 13–16. The growth pattern in the woody smilaxes is serial and not secondary.

Key to the Species of Woody *Smilax* of the Eastern United States North of Peninsular Florida

- A. Stems tomentose, lacking prickles; petioles tomentose; leaves densely tomentose beneath; berries red and with an acute tip; plant prostrate to sprawling, mostly 0.5 m or shorter *S. pumila*
- A. Stems glabrous to stellate-scurfy, usually with prickles; petioles glabrous; leaves glabrous or papillate beneath; berries black or dark blue or if red, then lacking a pointed tip; plant climbing, ascending, or rarely sprawling, mature plants taller than 0.5 m B

Table 1. Chart of the habitat characteristics of the nine woody species of *Smilax* in the eastern United States north of peninsular Florida.

Species	Wetland Ranking(s)	Sunlight	Elevation/m
<i>S. auriculata</i>	FACU	full sun to partial shade	0–100
<i>S. bona-nox</i>	FACU, FACU+, FAC	full to partial sun	0–1,000
<i>S. glauca</i>	UPL, FAC, FACU	full sun to partial shade	0–800
<i>S. laurifolia</i>	FACW, OBL	full sun to shade	0–400
<i>S. pumila</i>	NONE	full sun to shade	0–800
<i>S. rotundifolia</i>	FAC	full sun to shade	0–1,000
<i>S. smallii</i>	FACU, FAC	full sun to partial shade	0–600
<i>S. tannoides</i>	FAC, FAC+	full sun to partial shade	0–400
<i>S. walteri</i>	OBL	full sun to moderate shade	0–350

- B(A). Prickles abundant, thin and needle-like, black; blade veins distinctly reticulate on lower surface; blades drying to a light olive gray color; petiole 1 cm or longer . . . *S. tannoides*
- B. Prickles of the stem fewer, broad-based and awl-like or catclaw-like, green, brown, or black; blade veins not distinctly reticulate on lower surface; blades drying to green or brown; petioles mostly shorter than 1 cm . . . C
- C(B). Leaves evergreen; blades mostly elliptic to linear or narrowly ovate; stem diameter 2 cm or larger; plant climbing to 20 m or higher; plants flowering in August; berries requiring two years for maturity . . . D
- C. Leaves deciduous to tardily deciduous (evergreen in *S. auriculata*); blades mostly broadly ovate; stem diameter smaller than 2 cm; plant climbing to 10 m or lower (to 20 m in *S. bona-nox*); plants flowering April to July; berries maturing in one year . . . E
- D(C). Blades mostly oblong, thick with three veins at base, not reticulate, not variegated; petiole green to pink; blade margins without enations; berry with pointed tip . . . *S. laurifolia*
- D. Blades mostly elliptic, thin, with five veins at base, distinctly reticulate; sometimes variegated; petiole green; blade margins often with enations; berry lacking pointed tip . . . *S. smallii*
- E(C). Leaves evergreen, often ascending; blades thick; plants of coastal habitats . . . *S. auriculata*
- E. Leaves deciduous, rarely evergreen, not ascending; blades thin; plants of mostly inland habitats . . . F
- F(E). Berry red; petiole red; number of seeds two or more; plants of wet habitats . . . *S. walteri*
- F. Berry black to dark blue, not red; petiole green (sometimes pink in *S. glauca*); number of seeds one to three; plants of dry to wet habitats . . . G
- G(F). Blades distinctly glaucous abaxially; plants with tubers; peduncles terete . . . *S. glauca*
- G. Blades green on abaxial surface, not glaucous; plants with rhizomes; peduncles flattened . . . H
- H(G). Prickles at internodes only; no cowhorn prickles present; blades not variegated, average

- thickness; peduncles longer than 1.5 cm, twice as long as petiole; blade margins with enations; berry one seeded, not persistent; plant climbing to 6 m . . . *S. rotundifolia*
- H. Prickles at internodes and nodes; cowhorn prickles present; blades sometimes variegated, thick; peduncles shorter than 1.5 cm, as long as or shorter than petiole; blade margins lacking enations; berry 1–3 seeded, persistent; plant high climbing to 20 m . . . *S. bona-nox*

Characteristics of the Woody Species of *Smilax* of the Eastern United States North of Peninsular Florida

1. *Smilax auriculata* Walter, Fl. Carol. 245. 1788. (*S. beyrichii* Kunth; *S. lata* Small). Common names include wild-bamboo, earleaf greenbrier, beach greenbrier, bamboo vine, horse brier, and arrow leaf smilax. Habitats are dunes and sandy flatwoods. Reported range is Ala., Fla., Ga., La., Miss., N.C., S.C.; West Indies (Bahamas) (also reported from Arkansas by USDA, NRCS 2011).
2. *Smilax bona-nox* L. Sp. Pl. 2: 1030. 1753 (as *bona nox*). (*S. bona-nox* L. var. *exauriculata* Fernald, var. *hastata* (Willd.) A. DC., var. *hederifolia* (Bey.) Fernald, *S. hastata* Willdenow, *S. hederifolia* Beyrich ex Kunth, *S. renifolia* Small, *S. variegata* Walter). Common names include saw greenbrier, zarzaparrilla, green brier, China brier, tramp's trouble, stretch berry, fringed green brier, cat brier, and bull brier. Habitats are well-drained to wet areas in woods, fields, thickets, hedgerows, and floodplain forests. Reported range is AL, AR, D.C., DE, FL, GA, IL, IN, KS, KY, LA, MD, MO, MS, NC, OH, OK, SC, TN, TX, VA, Mexico, and West Indies. The var. *littorale* Coker differs in having glabrous (non-prickly) tubers and rhizomes and lacks the scurfy texture in the lower 2–3 ft (0.6–0.9 m) of the stem. Coker (1944) reports it in maritime habitats from NC to FL but we report it from

Table 2. Chart of the stem characteristics of the nine woody species of *Smilax* in the eastern United States north of peninsular Florida.

Species	Underground Stems	Habit	Stem Surface	Stem Shape	Max. Stem Diameter/mm	Max. Stem Height/m	Stem Color	Stem Scale Color
<i>S. auriculata</i>	tubers	climbing	glabrous with verrucose spots	terete	9	9	green to maroon	reddish brown to purple
<i>S. bona-nox</i>	rhizomes	climbing	glabrous or with stellate trichomes	terete to 4-angled	9	20	gray-green	brown
<i>S. glauca</i>	rhizomes/tubers	climbing	glabrous, glaucous, often mottled	terete	9	7+	green or blue green	rosy to brown
<i>S. laurifolia</i>	tubers	climbing	glabrous, glaucous, with verrucose spots	terete	25	20	green to brown	brown to rosy
<i>S. pumila</i>	none	prostrate to clambering	densely wooly pubescent	terete	3	1	green	brownish
<i>S. rotundifolia</i>	rhizomes	climbing	glabrous	terete to quadrangular	8	6	green	white to pink or red
<i>S. smallii</i>	tubers	climbing	glabrous, glaucous when young, with verrucose spots	terete	25	20	green to red brown	brown to rose
<i>S. tamnoides</i>	none	climbing	glabrous	terete	9	7+	green	greenish brown
<i>S. walteri</i>	rhizomes	climbing to sprawling	glabrous	terete	8	6	green	red to pink

Wayne County, NC in Neuse River Basin, ca. 160 km from the North Carolina coast.

3. *Smilax glauca* Walter, Fl. Carol. 245. 1788. (*S. glauca* var. *leurophylla* S. F. Blake; *S. spinulosa* Smith). Common names include saw green brier, glaucous leafed green brier, sarsaparilla, wild sarsaparilla, sawbrier, and sow brier. Habitats are dry to wet woods, thickets, hedge-rows, and roadsides. Reported range is AL, AR, CT, DC, DE, FL, GA, IL, IN, KS, KY, LA, MA, MD, MO, MS, NC, NE, NJ, NY, OH, OK, PA, RI, SC, TN, TX, VA, WV, and WY.
4. *Smilax laurifolia* Linnaeus, Sp. Pl. 2: 1030. 1753. (*S. alba* Pursh; *S. lanceolata* L.) Common names include lowland bamboo vine, bamboo vine, blaspheme vine, laurel greenbrier, China brier, bay leaf smilax, laurel brier, and bamboo vine. Habitats are bays, bogs, pocosins, bay-galls, swamp margins, and marshy banks. Range is AL, AR, DE, FL, GA, LA, MD, MS, NC, NJ, OK, SC, TN, TX, and VA. West Indies (Bahamas, Cuba).
5. *Smilax pumila* Walter, Fl. Carol. 244. 1788. (*S. humilis* Miller, name proposed for rejection; *S. pubera* Michaux; *S. puberula* Kunth). Habitats are woods, along streams, and sandy soil. Common names include sarsaparilla, dwarf green brier, hairy green brier, prostrate green brier, brier vine, ground brier, wild sarsaparilla, and sarsaparilla. Range is AL, AR, FL, GA, LA, MS, SC, and TX.
6. *Smilax rotundifolia* Linnaeus, Sp. Pl. 2: 1030. 1753. (*S. caduca* Linnaeus; *S. quadrangularis* Muhlenberg ex Willdenow; *S. rotundifolia* var. *crenulata* Small & A. Heller; *S. rotundifolia* var. *quadrangularis* (Muhlenberg ex Willdenow) Alph. Wood) Habitats are dry to moist, sometimes riparian woods, borders, hedgerows, and thickets. Common names include common greenbrier, common catbrier, bullbrier, horse-brier, sow brier, hungry vine, bread and butter, devil's hop vine, bamboo brier, wait-a-bit, biscuit leaves, and roundleaf greenbrier. Range is AL, AR, CT, DC, DE, FL, GA, IA, IL, IN, KS, KY, LA, MA, MD, ME, MI, MN, MO, MS, NC, NH, NJ, NY, OH, OK, PA, RI, SC, SD, TN, TX, and VA, and WV.
7. *Smilax smallii* Morong, Bull. Torrey Bot. Club. 21: 430. 1894. (*S. cinnamomiifolia* Small; *S. ovata* Pursh 1814, not Duhamel 1803). Common names include lanceleaf greenbrier, coral green brier, upland bamboo vine, Jackson vine, Jackson brier, bamboo vine, cantaque, and thornless smilax. Habitats are rich woods,

Table 3. Chart of the prickle characteristics of the nine woody species of *Smilax* in the eastern United States north of peninsular Florida.

Species	Location	Cowhorn	Shape	Character	Length/mm	Color/Surface
<i>S. auriculata</i>	nodes and internodes	no	flattened, angled downward slightly	rigid, stout	to 4	greenish
<i>S. bona-nox</i>	nodes and internodes	yes	flattened, broad based, becoming terete apically with sharp tip	rigid, stout	4–9	body brown & scurfy tip black
<i>S. glauca</i>	nodes and internodes	yes	slender, slightly recurved	thin to stout	1–5	dark brown
<i>S. laurifolia</i>	nodes and internodes	no	flat to almost terete	rigid	to 12	dark brown
<i>S. pumila</i> *						
<i>S. rotundifolia</i>	internodes only	no	flattened	stout	to 12	green with dark brown tips
<i>S. smallii</i>	nodes and internodes	no	flattened, recurved	rigid	to 12	brown to greenish
<i>S. tamnoides</i>	nodes and internodes	no	two kinds: bristly, slightly recurved	rigid, flexible	8–10, 2–3	blackish, light color
<i>S. walteri</i>	nodes and internodes	no	slightly recurved	subulate	to 5	rose colored with dark brown tip

* Not applicable.

- pinewoods, streambanks, edges of fields, swamp margins, ditches, in well-drained to dry soil. Range is AL, AR, D.C., DE, FL, GA, LA, MD, MS, NC, OK, SC, TX, and VA. Puerto Rico.
8. *Smilax tamnoides* Linnaeus, Sp. Pl. 2: 1030. 1753. (*S. grandifolia* Buckley; *S. hispida* Muhlenberg ex Torrey; *S. hispida* var. *australis* Small; *S. hispida* var. *montana* Coker; *S. tamnoides* var. *hispida* (Muhlenberg ex Torrey) Fernald). Common names include China root, hellfetter, bristly greenbrier, hag brier, devil green brier, and wild sarsaparilla. Habitats are wet to dry woods, thickets, and bottomlands. Range is AL, AR, CT, DC, DE, FL, GA, IA, IL, IN, KS, KY, LA, MA, MD, MI, MN, MO, MS, NC, NE, NH, NJ, NY, OH, OK, PA, SC, SD, TN, TX, VA, VT, WV, and WV. CAN (ON)
9. *Smilax walteri* Pursh, Fl. Amer. Sept. 1: 249. 1814. Common names include red-berried greenbrier, red-berried bamboo, coral greenbrier, redberry bamboo, sarsaparilla, redbead greenbrier. Habitats are wet thickets, low pinelands, swamps, baygalls, and boggy areas. Range is AL, AR, DE, FL, GA, LA, MD, MS, NC, NJ, SC, TN, TX, and VA.

DISCUSSION

The wettest habitat species is *S. walteri* and the driest species are: *S. glauca* and *S. pumila* (Table 1). Species with the greatest shade tolerance are *S. pumila*, *S. rotundifolia*, and *S. laurifolia*. Lowest elevation species is *S. auriculata* and the two highest elevation species are *S. bona-nox* and *S. rotundifolia*. The four species with tubers are *S. auriculata*, *S. glauca*, *S. laurifolia*, and *S. smallii* (Table 2). One species with both a pubescent stem and also a prostrate stem is *S. pumila*. *Smilax laurifolia* and *S. smallii* have the largest diameter stems while *S. pumila* has the smallest. Highest climbing species are *S. bona-nox*, *S. laurifolia*, and *S. smallii* and the lowest climbing is *S. pumila*. The only species with prickles only at the internodes is *S. rotundifolia*; all other species with prickles have them at the nodes and internodes (Table 3). Cowhorn type prickles are only found in *S. bona-nox* and *S. glauca*. Four evergreen species are *S. auriculata*, *S. laurifolia*, *S. pumila*, and *S. smallii* (Table 4). Species with erect or ascending leaves are *S. auriculata*, *S. laurifolia*, and *S. smallii* (branches cascade downward). Longest petioles are found in the leaves of *S. tamnoides* and the shortest in *S. pumila*. Petiole is non-green (red to pink) in *S. laurifolia*, *S. rotundifolia*, and *S. walteri* and sometimes

Table 4. Chart of the leaf characteristics of the nine woody species of *Smilax* in the eastern United States north of peninsular Florida.

Species	Leaves	Leaves	Petiole Length/cm	Petiole Color
<i>S. auriculata</i>	evergreen	often ascending	0.5–1.2	green
<i>S. bona-nox</i>	evergreen to tardily deciduous	don't ascend	0.7–1.5	green
<i>S. glauca</i>	deciduous to evergreen	don't ascend	0.5–1.5	green (pinkish on sun exposed plants)
<i>S. laurifolia</i>	evergreen	often erect	0.5–1.5	sometimes pink
<i>S. pumila</i>	evergreen	don't ascend	0.05–0.25 (often longer on sterile shoots)	green
<i>S. rotundifolia</i>	deciduous to semievergreen	don't ascend	0.5–1.5	pinkish
<i>S. smallii</i>	evergreen	branches cascadedown, leaves ascend	0.3–1.3	green
<i>S. tamnoides</i>	deciduous to semievergreen	don't ascend	1–2	green
<i>S. walteri</i>	deciduous to semievergreen	don't ascend	0.5–1	red

Table 5. Chart of leaf blade characteristics (shape, veins, thickness, size, and surface) of the nine woody species of *Smilax* in the eastern United States north of peninsular Florida.

Species	Shape	Veins	Thickness	Length/cm	Width/cm	Surface
<i>S. auriculata</i>	narrowly ovate to ovate-elliptic	three prominent, secondary obscure to prominent	very thick	4.5–6 (–8.5)	2–3.5	not glaucous, glabrous or minutely pubescent abaxially
<i>S. bona-nox</i>	broadly ovate to lanceolate-ovate or hastate to pandurate, conduplicate	three (–5) plus or minus prominent	thick	3–10	2.5–9	*
<i>S. glauca</i>	broadly ovate, elliptic to reniform	three or five, conspicuous, palmate raised on undersurface, some reddish	average	4.5–11	2.5–6.6	glabrous and glaucous abaxially
<i>S. laurifolia</i>	oblong-elliptic, lance-elliptic or linear or broadly ovate	three veined from not prominently reticulate,**base,	thick	7–13	1.3–4(6)	coriaceous,*
<i>S. pumila</i>	obovate to ovate-lanceolate	three prominent	average	6–10.5	5–8	glabrous adaxially densely puberulent abaxially
<i>S. rotundifolia</i>	ovate to broadly ovate	three or five $\pm$ prominent	average	4–17	4–16	lustrous, not glaucous glabrous abaxially
<i>S. smallii</i>	lanceolate-elliptic to narrowly ovate	prominently reticulate, five-veined from base	thin	5–6.6	1.7–3	abaxially glabrous, not glaucous sometimes with glaucous underleaf
<i>S. tamnoides</i>	ovate-lanceolate, ovate, or sometimes pandurate	prominently reticulate with five protruding veins on lower surface	thin	5–13	3–10	not glaucous, ***
<i>S. walteri</i>	ovate-oblong to ovate-lanceolate	three prominent	thin to average	6–10	3–7	*

* Not glaucous, glabrous or minutely pubescent abaxially.

** Lower midvein raised, not palmately veined, outer two veins much nearer margin than mid-vein.

*** Glabrous to prickly on major veins abaxially.

Table 6. Chart of leaf blade characteristics (color, variegation, base, apex, and margins) of the nine woody species of *Smilax* in the eastern United States north of peninsular Florida.

Species	Color	Variegation	Dry Color	Base	Apex	Margins	Enations
<i>S. auriculata</i>	green abaxially	no or little	brownish green	auriculate, pandurate or rounded*	acute to blunt but mucronate	entire, revolute	no
<i>S. bona-nox</i>	pale green	often	uniform tan	cordate to truncate, frequently lobed	rounded to short-apiculate	entire to remotely spinose-ciliate**,	no
<i>S. glauca</i>	green to glaucous green adaxially, silvery grayish abaxially	often adaxially	brownish tan	truncate, subcordate or attenuate	rounded, tapering or short-acuminate	entire, revolute	no
<i>S. laurifolia</i>	green to brownish green	no	pale brown	attenuate to rounded	acute to rounded, often mucronate	entire, often revolute	no
<i>S. pumila</i>	gray-green	sometimes ashy	gray green	cordate to deeply notched	bluntly pointed	entire	no
<i>S. rotundifolia</i>	bright green	no	pale to brownish green	cordate to rounded with acute insertion at petiole	abruptly pointed	entire, sometimes tightly revolute	yes

Table 6. Continued.

Species	Color	Variegation	Dry Color	Base	Apex	Margins	Enations
<i>S. smallii</i>	deep green	often	pale	green	rounded to cuneate	acuminate or acute	entire to undulate
<i>S. tamnoides</i>	green	not gray	light olive	rounded to cordate	pointed	entire apically, serrulate basally, thin, flat, not banded	minutely
<i>S. walteri</i>	green	no	lightly orange tinted brown	rounded, or sometimes* acute, mucronate	entire, revolute with enations on basal 1/3	young	

* Cuneate at insertion of petiole; **thickened by ribbed, cartilaginous band, often revolute and appearing as prominent vein parallel to margins.

Table 7. Chart of the umbel characteristics of the nine woody species of *Smilax* in the eastern United States north of peninsular Florida.

Species	Number	Location	Number of Flowers	Character	Shape
<i>S. auriculata</i>	3–8	terminal, axillary to leaves	5–8 (25)	loose	spherical
<i>S. bona-nox</i>	few to numerous	axillary to leaves	10–15	moderately dense	spherical
<i>S. glauca</i>	few to many	axillary to leaves	5–12	open	umbellate to hemispherical
<i>S. laurifolia</i>	numerous	axillary to leaves	5–12(–25)	±open	spherical
<i>S. pumila</i>	1–7	axillary to leaves	5–16	loose	spherical
<i>S. rotundifolia</i>	numerous	axillary to leaves	5–12(–20)	open to dense	hemispherical to spherical
<i>S. smallii</i>	many	axillary to leaves	7–15	loose to dense	hemispherical to spherical
<i>S. tamnoides</i>	many	axillary to leaves	to 25	open to dense	spherical
<i>S. walteri</i>	few to many	axillary to leaves	5–12	loose	hemispherical

Table 8. Chart of the inflorescence and flower characteristics of the nine woody species of *Smilax* in the eastern United States north of peninsular Florida.

Species	Peduncle Length/cm	Peduncle Shape	Flower Color	Pedicle Length (mm)	Tepal Length (mm)	Anther Length	Flower Fragrance
<i>S. auriculata</i>	0.2–1.5	terete chartreuse, yellow-green		2–10	♂ 6–8, ♀ 3–4	not measured	yes
<i>S. bona-nox</i>	1.5–6+, 2X > petiole	flattened	pale green	8–12	3–4.5	*	no
<i>S. glauca</i>	2–5	terete	yellow to bronze	5–10	3–7	>filament	no
<i>S. laurifolia</i>	0.5–1 (<subtending leaf)	terete	yellow, cream, or white	5–10	4–5	>filament	yes
<i>S. pumila</i>	0.2–0.8**	terete	yellowish	1–4	3–4	much shorter than filament	no
<i>S. rotundifolia</i>	0.5–1.5	flattened	pale yellowish, green to bronze	2–15	3–4	*	no
<i>S. smallii</i>	0.5–1	terete	green	3–10	3–6	±1/5 as long as filaments	yes
<i>S. tamnoides</i>	1.5–7	terete	green to bronze	4–12	4–5	*	no
<i>S. walteri</i>	0.5–2 cm***	flattened	brownish yellow	5–10	3–6	not measured	no

* Shorter than to ± equaling filaments; **shorter than to 1.5 as long as petiole of subtending leaf; ***generally shorter than petiole of subtending leaf.

Table 9. Chart of the fruit (berry) characteristics and flowering and fruiting times of the nine woody species of *Smilax* in the eastern United States north of peninsular Florida.

Species	Fruit					Flowering Dates	n
	Color	Shape	Size/ mm	Surface	Number Seeds		
<i>S. auriculata</i>	purplish, maroon, black, blue green	ovoid to flattened, round	6–7	glaucous	1–3	May–July	October–November
<i>S. bona-nox</i>	black	ovoid to spherical	6–8	shiny to dull, sometimes glaucous	one	mid-late April	September–November
<i>S. glauca</i>	blue to black	subglobose	8–10	shiny, glaucous	1–3	mid-late April	September–November *
<i>S. laurifolia</i>	black	void, oblong with pointed tip	5–8	shiny, glaucous	one	August	September–October **
<i>S. pumila</i>	brownish orange	ovoid, acute beaks	5–8	not glaucous	one	October–November	April–May
<i>S. rotundifolia</i>	blue-black to black	globose, round	5–8	glaucous	1–3	mid-late April	September–November *
<i>S. smallii</i>	black	globose to compressed, immature fruits = round	5.5–8	glaucous	1–3	August	July–August **
<i>S. tamnoides</i>	black, green black	globose, ellipsoid, almost round	6–10	not glaucous	1–2	April–May	September–November *
<i>S. walteri</i>	bright red	globose	7–9	shiny	2–4	mid-late April	September–November *

* Fruit persistent; ** maturing 2nd year.

in *S. glauca*. The blades are narrower (elliptic) than ovate in *S. laurifolia* and *S. smallii* (Table 5). The thickest of all blades is *S. auriculata* but *S. bona-nox* and *S. laurifolia* have thick blades and *S. smallii* and *S. tamnoides* have the thinnest blades. Variegated blades are often found in *S. bona-nox*, *S. glauca* and *S. smallii* and rarely in *S. auriculata* (Table 6). Enations are found along the blade margins in *S. rotundifolia*, *S. smallii*, *S. tamnoides*, and *S. walteri*. Most species produce loose flowered umbels with *S. bona-nox* producing the most dense (Table 7). Longest peduncles are produced by *S. bona-nox* and *S. tamnoides* and the peduncles are flattened in *S. bona-nox*, *S. rotundifolia*, and *S. walteri* and are terete in the other species (Table 8). Berries are red to orange in *S. pumila* and *S. walteri* and have pointed tips in *S. laurifolia* and *S. pumila* (Table 9). Number of seeds is always two or more in *S. walteri* and always only one in *S. bona-nox*, *S. laurifolia*, and *S. pumila*. Most unusual flowering time is by *S. pumila* in October to November and both *S. laurifolia* and *S. smallii* flower in August. Most fruits mature in the fall but *S. pumila*'s fruits mature in April to May and *S. laurifolia* and *S. smallii*'s fruits require two years for maturity. Fruits are persistent in *S. glauca*, *S. rotundifolia*, *S. tamnoides*, and *S. walteri*.

LITERATURE CITED

- ALLEN, C. M., D. A. NEWMAN, AND H. H. WINTERS. 2002. Trees, Shrubs, and Woody Vines of Louisiana. Allen's Native Ventures Press, Pitkin, LA. 333 p pp.
- ARBER, A. 1920. Tendrils of *Smilax*. Bot. Gaz. 69:438–442.
- CAPONETTI, J. D., AND M. W. QUIMBY. 1956. The comparative anatomy of certain species of *Smilax*. J. of the American Pharmaceutical Association 45(1):691–696.
- COKER, W. C. 1944. The woody smilaxes of the United States. J. Elisha Mitchell Sci. Soc. 60:27–69, plates 9–39.
- DIGGS, G. M., JR., B. L. LIPSCOMB, M. D. REED, AND R. H. O'KENNON. 2006. Illustrated Flora of East Texas. Vol. 1. Brit Press, Fort Worth, TX. 1594 pp.
- DUNCAN, W. H. 1967. Woody Vines of the southeastern United States. Sida 3:1–76.
- FLORA OF NORTH AMERICA EDITORIAL COMMITTEE. 2002. Flora of North America. Magnoliophyta: Liliidae: Liliales and Orchidales. Oxford Univ. Press, New York, NY 26:468–478.
- JUDD, W. S. 1998. The Smilacaceae in the southeastern United States. Harvard Pap. Bot. 3:147–169.
- MARTIN, B. F., AND S. C. TUCKER. 1985. Developmental Studies in *Smilax* (Liliaceae). I. Organography and the Shoot Apex. American J. of Botany 72(1):66–74.
- USDA, NRCS. 2011. The PLANTS Database (<http://plants.usda.gov>) (15 September 2011). National Plant Data Team, Greensboro, NC 27401-4901 USA.
- YATES, I. E., AND W. H. DUNCAN. 1970. Comparative studies of *Smilax* section *Smilax* of the southeastern United States. Rhodora 72(791):289–312.