

Notes on trifoliolate species of *Galactia* (Fabaceae) in Florida

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ABSTRACT

Galactia is an inordinately taxonomically difficult genus in the southeastern USA with wide variations in both circumscriptions and the application of names, despite the efforts of many botanists. This study focuses on the trifoliolate members within Florida and a key to their identification is provided. Illegitimate and misapplied names have persisted in usage, which has necessitated the description of two new species, *G. austrofloridensis* and *G. michauxii*. Additional discussion is provided for the trifoliolate species of *Galactia* in the southeastern USA. Specimens specifically matching the type specimen of *G. regularis* are not clearly evident in Florida. The lectotype of *G. volubilis* is accurate and must be followed, as there are numerous specimens matching its morphology (i.e. a retrorsely hirsute stem, well-spaced inflorescence nodes, twining habit, and glaucescent lanceolate-ovate leaflets). The delimitation of taxa within *Galactia* remains problematic. Published on-line www.phytologia.org *Phytologia* 99(2): 139-185. (May 9, 2017). ISSN 030319430.

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Galactia P. Browne contains ~100–150 species (Rogers 1949; Nesom 2015) and is partly characterized by its caducous stipules, papilionaceous corolla, and 4-parted calyx (Adams 1972). The type of the genus is the West Indian *G. pendula* Pers. (Rose 1906; Burkart 1971). It is a taxonomically challenging genus in the southeastern USA and elsewhere. Anent the Bahama archipelago, Correll & Correll (1982: 644) wrote “This is one of the most frustrating genera in our flora [...] it is a rather hopeless task to make a workable key for their identification [...] Specimens “look different” from one another but they represent the zenith of frustration to the worker.” Recent investigations have further explored relationships within *Galactia*, including a *matK* phylogeny that included a few specimens from the southeastern USA (de Queiroz et al. 2015: Fig. S3, pt. 2).

The few relatively clearly delimited species in the southeastern USA are *G. erecta*, *G. elliotii*, *G. mollis*, and *G. striata*. The remaining taxa of *Galactia* in the southeastern USA fall into the “*Galactia volubilis* group”, as termed by Isely (1998), who noted that “members are not only seemingly introgressive, but recurrently and reticulately variable [...] features are variable within the taxa and none, singly or in correlation with others seem diagnostic. [...] Their confluent nature, however, results in the necessary use of key statements that overlap.” A continuum of variation can be found for nearly any chosen morphological character.

Both species delimitation and the application of names have been profusely discordant for the “*G. volubilis* group” and few studies have cited specimens to document taxonomic concepts (Small 1933; Rogers 1949; Duncan 1979; Isely 1998; Ward & Hall 2004; Wunderlin & Hansen 2011; Nesom 2015). It is difficult to equate one author’s sense of a taxon to another author’s sense of a taxon without guesswork and affixing complicating qualifications such as “pro parte”, “sensu”, or “non” to particular authors. No

matter the decided taxonomy, regardless of lumping, splitting, or attempting the middle ground, one cannot help but feel it is an unavoidably, convoluted mess. Intraspecific frameworks are so far generally unexplored partly because relationships are uncertain and potentially multiplicative.

Though dividing the “*G. volubilis* group” into cohesive entities is challenging, abundant morphological and ecological diversity with biogeographic patterns is present within the group. Many segregates can be chiseled away from the “*G. volubilis* group” (Isely 1998), such as *G. austrofloridensis* (sp. nov.), *G. floridana*, *G. michauxii* (sp. nov.), *G. microphylla*, *G. minor*, *G. pinetorum*, and *G. smallii*. At the core of the group lie the oldest available names, *G. regularis* and *G. volubilis*, which have only been considered part of *Galactia* since the late 1800s (Nuttall 1818; Torrey & Gray 1838; Vail 1895). The circumscriptions of these Linnaean names, the application of their type specimens, and the recognized defining characters have varied substantially.

All taxa of the “*G. volubilis* group” have relatively weak stems and rely on surrounding vegetation to achieve any significant vertical height. The perceived presence or absence of twining exhibited on specimens has been relied upon to sort many taxa into two primary groupings: a prostrate, non-twining group and a twining group (e.g. Vail 1895; Small 1933; Rogers 1949; Ward & Hall 2004; Nesom 2015). It is unclear how much twining varies on a plant or within a taxon, and if it can be characterized as entirely present or absent, especially based on herbarium specimens alone. For example, Rogers (1949: 90–91) stated “the growth habits of [*G. michauxii* (as *G. “regularis”*)] do not seem to be of much taxonomic value” and described one plant which had both short erect stems and long decumbent branches with some tips twining. Specimens of the supposedly non-twining group that exhibit twining are not hard to find, e.g. *G. floridana* (Lakela 25360), *G. michauxii* (Becker & Hattaway WC0311, Franck 1478), and *G. smallii* (Avery 2164). Thus, by itself, twining does not appear to be a diagnostic character. Less twining might be expected in shorter, thicker, or more basal stems and in open areas in habitats such as flatwoods, sandhill, scrub, dunes, or pine rockland. More twining might be expected in thinner, distal stems and in areas with denser surrounding vegetation. Attentive fieldwork is needed to characterize aspects of plant habit, such as twining. Additional clarification might be gained from collections that include root structure and the base of the plant.

Another source of confusion may be the size of the flowers, whereby some studies specify the length of the corolla whilst others focus on the whole flower. It is as if these two measurements are being used interchangeably, but they could differ. It may be important when flower sizes exhibit a continuum among taxa. The mature flowers are subtended by two bracteoles that attach ~0.2–1 mm below the receptacular bulge. The receptacle could appear to be up to 0.8 mm long, from which the calyx arises. The calyx tube could be 2 mm long, enclosing the point of attachment of the corolla. Precisely measuring the corolla would require tearing away the calyx. The point of attachment of the corolla can certainly be approximated from the base of the calyx. Without magnification, it can be difficult to see the distinction between the bracts, receptacle, and base of the calyx, potentially causing variability in measurements. Here it is opted that the size of flower is a practical measurement that can be approximated from the base of the calyx to the tip of the keel (lower petal).

Molecular studies with extensive sampling may be useful to clarify or corroborate taxonomic treatments. Utilization of epitypes that very closely match type specimens in morphology and approximate locality may be desirable, especially if duplicates can be widely distributed to herbaria for additional study. Given the possibility of interbreeding among many taxa of *Galactia*, phylogenetic inferences from plastid DNA may be heavily influenced by biogeography and introgression (Rieseberg & Soltis 1991; Nevill et al. 2014; French et al. 2016), while the nucleus, comprising the bulk of a plant's unique genome, might be expected to reflect more of the morphology. Field studies, living plants, internal floral structures, and characters of the fruits and seeds have been rarely utilized (Duncan 1979) and might offer additional insight if explored more.

Additional discussion is provided below for the trifoliolate species of *Galactia* in the southeast USA. It is interpreted here that two putative taxa were previously given illegitimate or misapplied names, i.e. as *G. brachypoda*, misapplied (Nesom 2015), *G. glabella*, nom. illeg. (Duncan 1979), *G. grisebachii*, misapplied (Nesom 2015), or *G. parvifolia*, misapplied (Small 1933; Long & Lakela 1971; Isely 1998; Ward & Hall 2004). To address this problem, two species are described. A key to the Florida species is also provided that does not rely heavily on the degree of twining. Still, the key is merely an alternative to other systems and is not bereft of the same difficulties that plague the taxonomy of *Galactia*. The key may likely falter in attempting to categorize some specimens, an unfortunate pattern for *Galactia*. Specimens are cited below (Appendix 1) and figures presented (Appendix 2: Figs. 1–42) to document the taxonomic concepts. Specimens at FTG and USF were studied in person while all others were observed as digital images. All that can be said is that I have attempted a system most strongly derived from the close study of peninsular Florida specimens and that much more work is most importantly needed.

KEY TO SPECIES OF *GALACTIA* IN FLORIDA

1. Leaves 5-9 foliolate; corolla white [FL, s GA, s SC].....*G. elliotii*
1. Leaves 3-foliolate; corolla white, pink, or reddish
 2. Plant erect, if twining, only at the distal tip of the stem; inflorescence sessile, subsessile, or pedunculate; petioles usually subequal to longer than the terminal leaflet at some or most mature nodes; corolla white to light pink
 3. Plant erect, not twining; most inflorescences sessile, occasionally with mature peduncles < 9 mm long [e TX to n FL to NC] *G. erecta*
 3. Plant erect and sometimes twining distally; most inflorescences pedunculate, mature peduncles > 6 mm long [FL and sw GA].....*G. brachypoda*
 2. Plant prostrate, decumbent, clambering, or twining; inflorescence pedunculate, or if sessile then plant not erect; petioles usually subequal to shorter than the terminal leaflet, if petioles longer than terminal leaflet then plant not erect; corolla pink, purple to reddish
 4. Corolla and stamens reddish when dry or withered; inflorescence shoot-tip and immature fruits densely villous with spreading hairs [MS(?), AL to c FL to NC]..... *G. mollis*
 4. Corollas and stamens light brown, whitish, to blue, pinkish, or purplish when dry or withered; inflorescence shoot-tip and immature fruits villous, strigose, or glabrate with hairs mostly ascending to appressed or not dense

5. Banner (upper petal) often with white stripes adaxially, the base yellow to greenish yellow; mature inflorescence often with more than 15 flowers, nodes numerous and congested throughout the upper half of the rachis; fruit 5.5–9 mm wide; leaflets often with prominent pale, straw-colored secondary venation abaxially and reticulate venation inconspicuous adaxially [south FL] *G. striata*
5. Banner usually without white stripes or only the midvein white adaxially, the base mostly white; mature inflorescence usually with less than 15 (–25) flowers, nodes not congested or only congested in the upper third of the rachis; fruit < 6 mm wide; leaflets with secondary venation not prominent abaxially, or if prominent then somewhat reddish and reticulate venation conspicuous adaxially
6. Stems villous, canescent, tomentose, or pilose (glabrate on older stems), hairs mostly spreading to oblique, not appressed; hairs often persistent on calyx and adaxially on leaves
7. Mature leaflets with abaxial secondary venation usually not prominent, often white to yellow, and usually markedly reduced from midvein and generally discoloured and much paler, strongly glaucescent below, drying light-green to olive adaxially; reticulate venation usually inconspicuous adaxially without magnification, secondary venation usually not prominent adaxially; inflorescence to 55 cm long; fertile stems often less than 1 mm and not appearing leafy, i.e. internodes usually longer than the length of the terminal leaflet; plant often strongly twining, with stems sometimes inseparable and strongly intertwined
8. Leaflets usually elliptic and broadest near the middle to sometimes ovate; hairs of stems dense and spreading, villous, to sometimes retrorse-spreading (to rarely retrorse-appressed strigose?); flowers 7–9 mm long; inflorescence to 15 cm long [se KS to VA, to s NY(?), e TX to GA, n FL(?)]..... *G. regularis*
8. Leaflets usually ovate and broadest near the base to sometimes elliptic; hairs of stems distinctly retrorse, retrorse-spreading to retrorse-appressed, hirsute to strigose; flowers 9–14 mm long; inflorescence to 55 cm long [FL to e TX, AR, and VA] *G. volubilis*
7. Mature leaflets usually with abaxial secondary venation prominent, often reddish, gradually reduced from midvein and generally concolorous and only slightly paler, only lightly glaucescent below, often drying dark brown-green to light green adaxially; reticulate venation usually conspicuous adaxially without magnification, secondary venation sometimes prominent adaxially; if venation not strongly pronounced then stems appearing leafy with short internodes subequal to the terminal leaflet length; inflorescence to 23 cm long; fertile stems ca. 1 mm wide; plant often not twining, with stems usually easily separable
9. Most mature terminal leaflets usually > 2.5 cm long
10. Reticulate venation strongly prominent on both surfaces, usually conspicuous on both surfaces without magnification; leaflets with pellucid, whitish microscopic dots abundant on adaxial surface; distal secondary veins mostly at near right angles or descending [pine rocklands, Miami-Dade Co., FL]..... *G. pinetorum*

10. Reticulate venation prominent, but not strongly so, on both surfaces, usually not conspicuous abaxially without magnification and sometimes not conspicuous adaxially; leaflets with or without pellucid, whitish microscopic dots abundant on adaxial surface; distal secondary veins mostly ascending
11. Vestiture mostly villous, tomentose, to canescent [w peninsular FL to se GA, and vicinity(?)]. *G. floridana*
11. Vestiture mostly appressed strigose [FL to NJ]. *G. michauxii*
9. Most mature terminal leaflets usually < 2.5 (–3.5) cm long
12. Leaflets with appressed strigose hairs adaxially; inflorescence not exerted beyond the subtending leaf; inflorescence axis 10–20 mm [w panhandle of FL, s AL, and vicinity(?)]. *G. microphylla*
12. Leaflets with erect to ascending hairs adaxially; inflorescence usually exerted beyond subtending leaf, inflorescence axis (5–)20–60(–90) mm [pine rocklands, Miami-Dade Co., FL] *G. smallii*
6. Stems strigose, pubescent, or hirsute; hairs appressed or oblique, not spreading; hairs often deciduous on calyx and adaxially on leaves
13. Most leaflets < 15 mm wide, < 25 mm long, leaves often overlapping with those of adjacent nodes, terminal leaflet often subequal or longer than stem internodes, leaves densely covered with pellucid, whitish microscopic dots on adaxial surface; stem vestiture antorsely or retrorsely strigose [s MS to FL panhandle to NC]. *G. minor*
13. Most leaflets > 15 mm wide or > 25 mm long, if smaller, then leaves mostly not overlapping with those of adjacent nodes, and terminal leaflet usually shorter than the stem internodes, or if leaves smaller then pellucid, whitish microscopic dots (< 0.1 mm wide) mostly confined to veins and absent from outer leaf margin on adaxial surface; stem vestiture retrorsely hirsute or antorsely or retrorsely strigose
14. Mature leaflets with abaxial secondary venation usually not prominent, often white to yellow, and usually markedly reduced from midvein and generally discoloured and much paler, strongly glaucescent below, drying light-green to olive adaxially; reticulate venation usually inconspicuous adaxially without magnification, secondary venation usually not prominent adaxially; inflorescence to 55 cm long; fertile stems often less than 1 mm wide; plant often strongly twining, with stems sometimes inseparable and strongly intertwined
15. Leaflets consistently linear-oblong, > 4 times as long as wide (rarely with broadly elliptic leaflets), less than 7 mm wide [near pine rocklands, Miami-Dade and Monroe Cos., FL]. *G. austrofloridensis*
15. Leaflets elliptic to ovate to narrowly ovate, some or most or all < 4 times as long as wide or more than 7 mm wide, occasionally with some leaflets > 4 times as long as wide and narrowly ovate
16. Leaflets usually elliptic and broadest near the middle to sometimes ovate; hairs of stems dense and spreading, villous, to sometimes retrorse-spreading (to rarely retrorse-appressed strigose?); flowers 7–9 mm long; inflorescence to 15 cm long [se KS to VA, to s NY(?), e TX to GA, n FL(?)] *G. regularis*

16. Leaflets usually ovate and broadest near the base to sometimes elliptic; hairs of stems distinctly retrorse, retrorse-spreading to retrorse-appressed, hirsute to strigose; flowers 9–14 mm long; inflorescence to 55 cm long [FL to e TX, AR, and VA]..... *G. volubilis*
14. Mature leaflets usually with abaxial secondary venation prominent, often reddish, gradually reduced from midvein and generally concolorous and only slightly paler, only lightly glaucescent below, often drying dark brown-green to light green adaxially; reticulate venation usually conspicuous adaxially without magnification, secondary venation sometimes prominent adaxially; inflorescence to 23 cm long; fertile stems ca. 1 mm wide; plant often not twining, with stems usually easily separable
17. Reticulate venation prominent, but not strongly so, on both surfaces, usually not conspicuous abaxially without magnification and sometimes not conspicuous adaxially; leaflets with or without pellucid, whitish microscopic dots abundant on adaxial surface; distal secondary veins usually ascending [FL to NJ].....*G. michauxii*
17. Reticulate venation strongly prominent on both surfaces, usually conspicuous on both surfaces without magnification; leaflets with pellucid, whitish microscopic dots abundant on adaxial surface; distal secondary veins often perpendicular, nearly so, or descending [pine rocklands, Miami-Dade Co., FL] *G. pinetorum*

TAXONOMY

- Galactia austrofloridensis* A. R. Franck, sp. nov. Type: USA, Florida, Monroe Co., Big Pine Key, 6 Aug 1966, Long *et al.* 2014 (holotype, USF). Figs 1–5.
- Galactia parvifolia* sensu auct., non *Galactia parvifolia* A. Rich., Hist. Phys. Cuba, Pl. Vasc. 414–415. 1845. Type of *G. parvifolia* A. Rich.: Cuba, *de la Sagra s.n.* (probable holotype, P [P00798723]).
- Galactia grisebachii* sensu Nesom, Phytoneuron 2015-42: 38–40. 2015, non *Galactia grisebachii* Urb., Symb. Antill. 5: 372. 1908. Lectotype of *G. grisebachii* Urb. (designated by Nesom 2015): Cuba. Wright “2335” (BREM; probable isoelectotypes, B? [destroyed?], K, NY, US, W).

Description: Plants twining. Stems glabrate, hirsute, or strigose, hairs retrorsely oblique to appressed. Leaflets 3, linear-oblong, more than 4 times as long as wide (up to 10 times as long as wide), rarely with a few leaflets broadly elliptic and less than 4 times as long as wide, to 33 mm long and 7 mm wide, the margins usually nearly parallel for the entire length of the leaflet, rounded to emarginate at the base, rounded to emarginate to apiculate to retuse at the apex, glaucescent abaxially, adaxial reticulate venation usually inconspicuous and abaxial secondary venation usually not prominent. Inflorescence to 15 cm long or more, with a peduncle (distance to first flower node) to 4.5 cm. Flowers 8–11 mm long. Fruit to 2.5 cm long. Seeds to 3 mm long.

Galactia austrofloridensis is here established for what has long gone by the name *G. parvifolia* (Small 1933: 719; Long & Lakela 1971: 492; Isely 1998; Ward & Hall 2004) or more recently by *G. grisebachii* (Nesom 2015). The protologues and type specimens of *G. grisebachii* and *G. parvifolia* do

not to apply to the plants found in Florida. In particular, the Florida plants (*G. austrofloridensis*) have long inflorescences often exerted beyond the leaves with well-spaced internodes and up to nine flowers, the rachis of which is often longer than the subtending terminal leaflet. The inflorescences of *G. grisebachii* and *G. parvifolia* are rather short and rarely exerted beyond the leaves with smaller internodes and up to five flowers, the rachis often being subequal to shorter than the subtending terminal leaflet. Narrow leaflets and short inflorescences are found on other specimens in the West Indies likely assignable to *G. grisebachii* or *G. parvifolia* e.g. from Cuba (*Britton & Gager 7683* [NY], *Britton et al. 14079* [NY], *León & Acuña 13065* [NY], *Shafer 2476* [NY]), Haiti (*Ekman H-6037* [NY]) and the Bahamas (*Correll & Correll 47675* [FTG, NY], *Correll et al. 49725* [FTG], *Hill 3360* [FTG]). Some of these specimens, like a probable isoelectotype (NY) of *G. grisebachii*, have conspicuous reticulate venation, unlike *G. austrofloridensis*. The names *G. grisebachii* and *G. parvifolia* are here excluded from the Florida flora.

The protologue of *G. parvifolia* mentioned a 2–3 flowered inflorescence, pilose calyx, and villous fruit. The protologue of *G. grisebachii* (from *G. stenophylla* Urb., nom. illeg.) described a 3–5 flowered inflorescence, sparsely appressed short-pilose calyx, appressed short-pilose fruit, and noted it might be nothing but a variety of *G. parvifolia*. In the key, Urban (1900: 307–309) mentioned both had short peduncles and only distinguished *G. grisebachii* (as *G. “stenophylla”*) by its equal leaflets while *G. parvifolia* had unequal leaflets that were sometimes also linear. *Galactia grisebachii* and *G. parvifolia* may be synonymous with each other as the probable isoelectotype of *G. grisebachii* at NY shows variable leaflet morphology and both have short inflorescences. As noted by Nesom (2015), another collection at P (P00798722) is not *G. parvifolia* and has rather long, many-flowered inflorescences. *Dolichos filiformis* L. appears conspecific with *G. grisebachii* and/or *G. parvifolia*.

Galactia austrofloridensis is characterized by the strongly twining specimens with linear-oblong leaflets found around pine rockland habitat, mostly congruent with the distributions given by others (under the misapplied names, Long & Lakela 1971; Isely 1998; Ward & Hall 2004; Nesom 2015). *Galactia austrofloridensis* has clear affinities with *G. volubilis* (Rogers 1949: 81; Isely 1998: 569), and they both have retrorsely hirsute to strigose stem vestiture. Antrorse stem vestiture has been reported (Nesom 2015: 39), but this morphology appeared absent from the specimens seen by the present author (Appendix 1; Fig. 3). There are many specimens of *G. volubilis* in south Florida and along the coast that approach *G. austrofloridensis*, but these are usually not consistently linear-oblong and are not found near pine rocklands. Specimens of *G. volubilis* with similarly narrow leaflets usually still have predominantly ovate leaflets, narrowing towards the apex and widest below the middle. It is a rather arbitrary distinction. Since this taxon, *G. austrofloridensis*, has been recognized in the past, now at least an applicable name is available for it. Because of the obvious similarity and likely gradation between *G. austrofloridensis* and *G. volubilis*, I find it unsatisfactory to recognize *G. austrofloridensis* at the species level and am wont to use infraspecific taxonomy, or lump it into *G. volubilis* as was done by Rogers (1949). However, many other taxa of the “*G. volubilis* group” could be recognized at the infraspecific level or synonymized for the same reasons. Until relationships are better understood within the “*G. volubilis* group”, *G. austrofloridensis* is reluctantly recognized.

Galactia pilosa Nutt. var. *angustifolia* Torr. & A. Gray (= *G. volubilis* var. *intermedia*, nom. illeg.) described similarly linear-oblong leaflets but no type specimen is known and no information

concerning distribution was given. The varietal epithet of this name is blocked at the species level by *G. angustifolia* Kunth. As no specimens from south Florida are cited with this name (as was done with *G. spiciformis* by Torrey & Gray), it is presumed that the type specimens are not from south Florida and this name is synonymous with *G. volubilis*.

Galactia brachypoda Torr. & A. Gray, Fl. N. Amer. 1: 288. 1838. Type: USA, Florida, dry barrens, s.d., Chapman s.n. (holotype, NY [barcode 00008088]; probable isotype, NY ex Columbia College [barcode 00008090]). Figs. 6–7.

Galactia brachypoda has long been a perplexing name. The presumed holotype of *G. brachypoda* is a Chapman specimen at NY ([barcode 00008088]), the repository for Torrey's type specimens (Stafleu et al. 1976–1988), with the words “dry barrens” on the label, as it is congruent with the protologue phrase “dry pine barrens[.]” The probable isotype at NY came from Columbia College, a primary repository for Chapman's type specimens (Trelease 1899; Stafleu et al. 1976–1988).

The type specimens of *G. brachypoda* (Fig. 6) are similar to specimens of *G. erecta* and *G. mollis*, having corollas drying or withering to a reddish color on specimens. Of *G. brachypoda*, Rogers (1949) wrote that it “resembles *G. erecta* [...] so much that its identity is often overlooked.” Isely (1986) wrote that it is “probably either a freak form of *G. erecta* or an exceptionally rare hybrid with one of the viny species.” Ward & Craighead (1990) speculated it was “probably an aberrant form of the northern” *G. erecta*. Ward & Hall (2004) wrote that *G. brachypoda* is “clearly related, if not conspecific” to *G. erecta*.

On the holotype label appears to be written “*Galactia mollis*”, “*brevipedunculata* n. sp.”, and “seems to come between *G. mollis* & *G. sessiliflora* [*G. erecta*]”. With its narrowly elliptic leaflets and petiole longer than the terminal leaflet, *G. brachypoda* appears conspecific with *G. erecta*. However, the type specimens of *G. brachypoda* also have pedunculate inflorescences with villous tips like *G. mollis*, while those of *G. erecta* are generally sessile and more strigose to glabrate. Other specimens exhibit intermediacy between typical *G. erecta* and *G. mollis*. A specimen from Baker Co., GA (*Anderson 15642*; Fig. 7) was originally identified as *G. brachypoda* and noted on the label to be erect with limited twining, sympatric with *G. erecta* and *G. mollis* (*Anderson 15645*), and possibly to be a hybrid between them. This specimen also exhibits pedunculate inflorescences. From Colquitt Co., GA, *Duncan et al. 17113* shows shortly pedunculate inflorescences and a partly twining habit. It seems likely that *G. erecta* and *G. mollis* do hybridize and apparent hybrids should be referred to as *G. brachypoda* (e.g. *Anderson 15642* and *Duncan et al. 17113*).

One other Chapman specimen at MO (acc. no. 793008) appears to be a mixed collection, with only the left specimen of the three appearing to be *G. brachypoda* (five pedunculate inflorescences, immature fruit villous, petioles seeming shorter than in *G. erecta*, stem tip curvaceous, and plant more pubescent like *G. mollis*), as annotated by Rogers. The middle and right specimen correspond with *G. erecta*, as annotated by Rogers. Though being a mixed collection, perhaps these specimens were collected at the same time and place and are indicative of *G. erecta* being involved in forming *G. brachypoda*. The label reads “*Galactia sessiliflora*” and “Wewahitchka August 1896 W. Florida” seeming to be Chapman's handwriting. On the sheet in unknown handwriting is the word “type” but if the label date is correct these cannot be type specimens. Another Chapman specimen (NY ex Sartwell Collection, Hamilton College

[barcode 00008089]) was labeled *G. brachypoda* but is unlike the type specimens of *G. brachypoda* and fits well with *G. erecta* (Nesom 2015). Rogers (1949) misattributed a specimen (*Hood s.n.* [48749]) of *G. pinetorum* from Miami-Dade Co. to *G. brachypoda*, far out of the range of *G. erecta* and *G. mollis*.

It is here regarded that *G. brachypoda* Torr. & A. Gray is possibly intermediate between *G. erecta* and *G. mollis*, and that *G.* “brachypoda” sensu Nesom is misapplied. With regard to *G. brachypoda*, Isely (1986) noted “I have found no similar gatherings in any of the three major Florida herbaria (FSU, FLAS, and USF).” Similarly, I find no specimens, except the ones noted here (*Chapman s.n.*, *Anderson 15642*, and *Duncan et al. 17113*), that appear identifiable as *G. brachypoda*. Additional research is needed to determine if *G. brachypoda* is merely an occasional hybrid and/or sterile, or if it produces viable seeds and stable populations that may be rare and of conservation concern. This taxon should be searched for closely where *G. erecta* and *G. mollis* are sympatric.

Galactia erecta (Walter) Vail, Bull. Torrey Bot. Club 22: 502. 1895. *Ervum erectum* Walter, Fl. Carol. 187. 1788. Neotype (designated by Ward 2008): USA, South Carolina, Georgetown Co., 5 mi. S of Andrews, 10 Sep 1939, *Godfrey 147* (GH; isoneotypes, BH, DUKE, F, MO, NY, US). Figs. 8–9.

Glycine stricta Hook., Companion Bot. Mag. 1: 22. 1835. Type: USA, Louisiana, St. Tammany Par., Covington, *Drummond s.n.* (not located).

Galactia sessiliflora Torr. & A. Gray, Fl. N. Amer. 1: 288. 1838. Lectotype (designated by Nesom 2015): USA, Florida, *Chapman s.n.* (holotype, GH; isotypes, GH, NY).

With its erect habit and essentially sessile inflorescences, *G. erecta* is probably the most recognizable trifoliolate species of *Galactia* in the southeastern USA. Torrey & Gray (1838) suggested it may be closely related to *G. brachystachys* Benth. of Mexico.

Galactia floridana Torr. & A. Gray, Fl. N. Amer. 1: 288. 1838. Type: USA, Florida, Hillsborough Co., Tampa, “sandy places about Tampa Bay”, *Dr. Burrows s.n.* (probable holotype, NY [barcode 00005288]). Figs. 10–13.

Galactia fasciculata Vail, Bull. Torrey Bot. Club 22: 505. 1895. Type: USA, Florida, Hillsborough Co., Tampa, “climbing on small shrubs”, 24 Aug 1895, *Nash 2480* (holotype, NY ex Columbia College [barcode 00008083]; isotypes, AC, GH, MSC, NDG, NEB, NY, OS, P, US).

Galactia floridana Torr. & A. Gray var. *longeracemosa* Vail, Bull. Torrey Bot. Club 22: 505. 1895. Lectotype (designated by Nesom 2015): USA, Florida, 1889, *Simpson s.n.* (US; isotypes, MU, US).

Galactia volubilis var. *baltzelliana* D. B. Ward & D. W. Hall, Phytologia 86: 68. 2004. Type: USA, Florida, Lake Co., 1505 Moss Avenue, 1 mi. N of Leesburg, 25 Sep 1975, *Hall & Baltzell 413* (holotype, FLAS; isotypes, FLAS).

Galactia floridana is characterized by its densely villous-tomentose stems (Figs. 11–12) and relatively large flowers. Because of their similarities, *G. fasciculata* is here tentatively treated as a synonym of *G. floridana*. *Galactia fasciculata* was originally partly distinguished by its twining habit, compared to a non-twining habit in *G. floridana*. Curvaceous stems are common in *G. floridana* (sensu here), similar to some of the type specimens of *G. fasciculata* (e.g. NY, P). A specimen of *G. floridana*

(as here identified, *Lakela 25360*) described on its label a “vine mostly prostrate under large trees,” exhibiting twining similar to the US isotype of *G. fasciculata*. Three other specimens of *G. floridana* (*Lakela 25304*, *Lakela 25377*, *Schmidt 54*) described twining on their labels. Isely (1998) characterized *G. floridana* as trailing or partly twining.

The type specimen of *G. fasciculata* is evidently villous on the stem, consistent with *G. floridana*. Vail described the stems of *G. fasciculata* as “clothed with a close fine retrorse-canescens tomentum” similar to her description of *G. floridana* as often “densely and retrorsely white-tomentose”. Non-twining specimens of *G. floridana* can also exhibit fasciculate inflorescences (*Franck 1218*, *Myers 691*, *Kral 7878*, *Thorne 48584*) and zig-zag inflorescences (*Ray 9352*), similar to the purported distinguishing characters of *G. fasciculata*. Many nodes among the type specimens of *G. fasciculata* do not have fasciculate inflorescences. The calyces of the type specimens of *G. fasciculata* appear moderately pilose to villous (described as “clothed with short, white, silky hairs” in the protologue), also found on specimens of *G. floridana*.

For *G. volubilis* var. *baltzelliana*, the type specimens (from Lake Co.) and a cited paratype (from Levy Co.) appear densely tomentose on the stem, similar to *G. floridana*. This variety was distinguished by flowers 13–21 mm long (vs. 11–14 mm in *G. floridana*), calyx 9–12 mm long (vs. 6–8 mm), and vigorously climbing or that plants “climb robustly through overlying vegetation” (vs. trailing in *G. floridana*) (Ward & Hall 2004). Other specimens of *G. floridana* have described “high twining” (*Lakela 25377*) or “twining in profusion over fallen shrub” (*Lakela 25304*) and are consistent with the morphology of *G. floridana*. It is here tentatively treated that *G. volubilis* var. *baltzelliana* is synonymous with *G. floridana*. The type specimen of *Galactia floridana* var. *longeracemosa* has dense stem vestiture and is here tentatively synonymized with *G. floridana*.

Galactia floridana probably grades into other taxa such as *G. michauxii* or *G. microphylla*. Indeed, *G. floridana* seems comparatively only more villous than *G. michauxii*, but similarly lignescent. *Galactia floridana* is very similar to *G. smallii*, a pine rockland species only marginally distinguished by its usually smaller leaflets and disjunct distribution. The leaflets of *G. floridana* seem usually to have more conspicuous reticulate venation adaxially and are usually larger than *G. microphylla* (Rogers 1949) and *G. regularis*.

Galactia floridana may be nearly endemic to Florida and southeastern Georgia. However, it is also reported from other areas but it is unclear if these specimens are possibly more related to *G. microphylla*, *G. minor*, or *G. regularis*. For example, the *McKenzie 264* (LSU) specimen from Louisiana seems likely to be *G. microphylla* or *G. minor*, given the rather small leaflets, short internodes, and short inflorescence (cf. Nesom 2015: 15).

Galactia michauxii A. R. Franck, sp. nov. Type: USA, Florida, Palm Beach Co., W side of US 1, Juno Beach area, 21 Apr 1962, *Lakela 24958* (holotype, USF; isotype, FSU). Figs. 14–18.

Galactia regularis sensu auct., non *G. regularis* (L.) Britton et al.

Galactia glabella sensu W. H. Duncan, Sida 8: 173–178. 1979, non *G. glabella* Michx., nom. illeg.

Galactia brachypoda sensu G. L. Nesom, Phytoneuron 2015-42: 12–15. 2015, non *G. brachypoda* Torr. & A. Gray.

Description: Plants prostrate to occasionally twining. Stems strigose, hairs retrorsely or antrorsely appressed. Leaflets 3, ovate to elliptic, less than 4 times as long as wide, to 5.5 cm long and 4.5 cm wide, the margins generally not parallel, rounded to emarginate at the base, rounded to emarginate to apiculate to retuse at the apex, only lightly glaucescent abaxially, usually with conspicuous adaxial reticulate venation and prominent abaxial secondary venation. Inflorescence to 23 cm long, with a peduncle to 7 cm long. Flowers 10–18 mm long. Fruit to 5.5 cm long. Seeds to 4 mm long.

The name *Galactia michauxii* is here established for what has been referred to as *Galactia* “regularis” (sensu auct., here regarded as misapplied), *Galactia* “glabella” (sensu Duncan, an illegitimate name), or *Galactia* “brachypoda” (sensu Nesom 2015, here regarded as misapplied), as no other specific epithet is evidently available. *Galactia michauxii* is likely equatable to *G. volubilis* sensu Ward & Hall (2004) and Wunderlin & Hansen (2008), pro parte. This species is characterized by its mostly appressed strigose stem vestiture (Figs. 16–17), leaflets with conspicuous secondary and reticulate venation (Fig. 14), inflorescence with the flowers congested near the tip, and larger flowers to 18 mm long.

As with *G. austrofloridensis*, this taxon (*G. michauxii*) had previously been recognized by improper names, and now has an available, applicable name. I had resisted giving this taxon a name, as introducing more names in *Galactia* hardly seemed like progress. I had attempted to lump it with other taxa like *G. regularis*, but that type (Clayton 121) with small flowers and spreading hairs does not seem applicable. The concept of *G. “regularis”* in Rogers (1949) described “prostrate or procumbent stems, occasionally twining slightly, [that are] minutely retrorse pubescent” with a mainly coastal distribution, consistent with the concept of this taxon. This taxon (*G. michauxii*) had been lumped into *G. volubilis* by others (Ward & Hall 2004; Wunderlin & Hansen 2011), but the lectotype of *G. volubilis* does not seem applicable. *Galactia floridana* could encompass this taxon, but *G. floridana* has typically been interpreted by its spreading, villous vestiture.

A proposal for conservation of *G. glabella* with perhaps its likely intended (but sterile) type specimen (P00680461) could be made. Its intended type specimen (P00680461; Fig. 15) shows conspicuous adaxial reticulate venation and prominent abaxial secondary venation, and may not be strongly twining, consistent with *G. michauxii*. The stems of P00680461 are relatively straight to curvaceous except for a leafless, strongly twining orangish stem which may not be the same taxon, possibly indicating a mixed collection or simply variability in twining. Its label has the semblance of the words “bulbos. Carolina” but has also been interpreted as “Col Co S. Carolina” to mean Colleton Co. (Duncan 1979: 175). Attempting to conserve *G. glabella* with a conserved type is problematic because of the sterile unicate type specimen (though a different type specimen could be selected, McNeill et al. 2012: Art. 14.9) and the fact that little stability would be gained for a name that has not been widely adopted or consistently applied. Thus, if this taxon (with usually prostrate stems, appressed strigose stem vestiture, and large flowers) is to have a name, it seems the best option is to make one. I here introduce the name *G. michauxii* to honor Michaux, in that his sense of *G. glabella* may have represented this taxon as interpreted by Duncan (1979). Still, *G. michauxii* is not an ideal taxon in that it seems to merge with other taxa.

Galactia floridana appears quite similar to *G. michauxii*, and seems to only differ by being villous on the stems (vs. usually appressed strigose in *G. michauxii*), while *G. pinetorum* primarily differs by its narrower leaflets and more prominent venation and *G. smallii* by its smaller leaflets and villous vestiture. The specimen *Melvin s.n.* (NCU [203568]) attributed to *G. pinetorum* (Nesom 2015) is here regarded as *G. michauxii*, which frequently has narrow leaflets but is not found in pine rocklands. Some specimens here identified as *G. michauxii* approach *G. floridana* (Martin & Cooper 774, Woodmansee & Green 1847, Lakeal 24180, Lakela 24567) and some are marginally separable from *G. smallii* (Howell 1022, Lakela 24959). Whether *G. volubilis* merges with *G. michauxii* is uncertain but probable. Duncan (1979, as *G. glabella*) and Nesom (2015, as *G. brachypoda*) both noted the peculiar antrorsely appressed forms of *G. michauxii* that were otherwise inseparable from retrorsely appressed forms. *Galactia michauxii* differs from *G. regularis* by its usually prostrate stems, appressed vestiture on the stems, and larger flowers. It differs from *G. volubilis* by its usually prostrate stems, usually elliptic leaflets with more prominent or conspicuous venation, and inflorescences with congested flowers near the apex.

Galactia microphylla (Vail) H. J. Rogers ex Isely, Brittonia 38: 354. 1986. *Galactia floridana* Vail var. *microphylla* Chapm., Fl. South. U.S. 108. 1860. Type: USA, Florida, *Chapman s.n.* (probably holotype, NY ex Columbia College [00008130]). Figs. 19–20.

Galactia microphylla has a characteristically leafy look, with rather short stem internodes similar to *G. minor* but differs by its villous stem vestiture (Fig. 20; vs. strigose in *G. minor*). Additional study is needed to determine its distribution and putative distinctions among *G. floridana*, *G. minor*, and *G. regularis*. Flowers of this species can measure to 15 mm long (e.g. *Carlton s.n.*, Appendix 1), although smaller flowers have been reported (Nesom 2015).

The authorship of this name is rather tricky. Isely (1986) credits “Rogers ex Hall & Ward” while Ward & Hall (2004) suggest the authorship should be credited to Isely, which is followed here since Isely was responsible for publishing the name. It is as if the authorship could be documented as “H.J. Rogers ex D.W. Hall & Ward ex Isely.”

Galactia minor W. H. Duncan, Phytologia 37: 59. 1977. Type: USA, Georgia, Long Co., adjacent to Altamaha River bottom SW of Ludowici, 2 Aug 1953, *Duncan et al. 16993* (holotype, GA [acc. no. 99594]; isotype, VDB). Figs. 21–23.

Similar to *G. microphylla*, *G. minor* has rather short stem internodes but differs by its strigose stem vestiture (Fig. 22). Additional study is needed to determine its relationship with *G. floridana*, *G. microphylla*, and *G. regularis*. It has been stated that *G. minor* has only antorse stem vestiture (Duncan 1979; Nesom 2015), though a form with retrorse appressed hairs (*Demaree 35909*) is otherwise identical with *G. minor* (and here identified as *G. minor*). The notion that strigose stem vestiture can be antorse or retrorse is also seen in *G. michauxii*.

Galactia mollis Michx., Fl. Bor.-Amer. 2: 61. 1803. Type: USA. Herb. Poiret (probable holotype, P [P00798742]). Figs. 24–25.

Ervum volubile Walter, Fl. Carol. 187. 1788. *Galactia glabella* Michx., Fl. Bor.-Amer. 2: 62. 1803, nom. illeg. *Galactia purshii* Desv., Ann. Sci. Nat. (Paris) 9: 413. 1826, nom. illeg. Type: not designated.

Galactia pilosa Nutt., Gen. N. Amer. Pl. 2: 116. 1818. Type: USA, Georgia (holotype, PH [25556]; isotype, BM [BM001042768]).

Galactia mollis Michx. var. *nashii* Vail ex Small, Man. S.E. Fl. 720. 1933. Type: USA, Florida, Lake Co., vicinity of Eustis, Jul 1894, *Nash 880* (holotype, NY [0008093]).

The flowers that wither or dry to a reddish color (Fig. 24) and the villous immature fruits (Fig. 25) and young inflorescence tips are good characters to identify *G. mollis*. Still, many specimens of the “*G. volubilis* group” are commonly misidentified as this species. It is here regarded that the putative type specimen *Nash 880* (NY) of *Galactia mollis* var. *nashii* Vail ex Small is entirely consistent and synonymous with *G. mollis* (Small 1933: 720; Rogers 1949; cf. Nesom 2015: 12). It is also proposed that *Ervum volubile* is best regarded as a synonym of *G. mollis*.

The name *Ervum volubile* was published as “*Ervum? volubile*” for which Art. 35.2 (McNeill et al. 2012) could almost apply, “a combination is not validly published unless the author definitely associates the final epithet with the name of the genus”, since Walter places a question mark next to *Ervum* suggesting an indefinite association. However, Art. 36.1 (McNeill et al. 2012) then states that a name is still validly published if accepted by the author despite the use of a question mark.

It is possible that *Ervum volubile* was meant to be a new combination from the basionym *Hedysarum volubile* L. (Nesom 2015), but this seems unlikely given that Walter did cite Linnaean basionyms in other cases where Walter placed them in a different genus than Linnaeus (e.g. *Hedera arborea* (L.) Walter, *Sophora perfoliata* (L.) Walter, *Verbesina occidentalis* (L.) Walter), in each case placing a question mark as to the genus or the Linnaean basionym. Walter may have described a new taxon, observed a twining habit, and thus proceeded to use the epithet “volubile.” The lack of a known extant type specimen (see Ward 2007) and the inadequate protologue make it difficult to apply *Ervum volubile* with confidence to any taxon of *Galactia*. Though many authors have considered it a synonym of *G. regularis* or *G. volubilis*, it is conceivable that it is synonymous with *G. mollis*, for which the epithet “volubile” would also be appropriate. Walter placed only *E. volubile* and *E. erectum* (= *G. erecta*) together under his sense of *Ervum* L. and both *G. erecta* and *G. mollis* have flowers that wither or dry to a reddish color (and occur in South Carolina). The description of ovate leaflets emarginate at both ends (variable within many taxa of *Galactia*) are consistent with *G. mollis*, but the incarnate flowers seem more specific to *G. mollis* than other species in *Galactia*. Yet, even if the application of *E. volubile* were secure, the epithet is unavailable in *Galactia* since *G. volubilis* (L.) Britton is based on the same epithet. Thus, *G. mollis* Michx. still has priority within the genus.

In the protologue of *Galactia glabella* Michx., a direct quotation was made in synonymy for “*Ervum? volubile*. Walt.” When published in 1803, *G. glabella*, in citing the legitimate *Ervum volubile*, must be considered illegitimate and typified by *Ervum volubile* (McNeill et al. 2012: Art. 52.1). Since the question mark was not introduced by Michaux to indicate uncertainty but was rather a quotation of the name from Walter, Art. 52.2, note 1, ex. 13 (McNeill et al. 2012) does not apply. *Galactia glabella* cannot be considered a replacement name since the epithet “volubile” was available in *Galactia* in 1803

(McNeill et al. 2012: Art. 6.4), and the epithet was only later combined into *Galactia* in 1894 based on the Linnaean basionym. *Galactia purshii* Desv., nom. illeg., also adopted the type of *E. volubile* by citing *G. glabella* (rather circuitously) (Nesom 2015).

Galactia pinetorum Small, Fl. Miami 93, 200. 1913. Type: USA, Florida, Miami-Dade Co., between Coconut Grove and Cutler, 9 May 1904, *Small & Wilson 1592* (holotype, NY). Figs. 26–29.

The conspicuous and strongly prominent leaflet venation (Fig. 29) are diagnostic features for *G. pinetorum*, which is confined to pine rocklands. The stems have appressed retrorse or antrorse strigose hairs (Figs. 27–28), similar to *G. michauxii*, which grades into *G. pinetorum*.

Galactia regularis (L.) Britton et al., Prelim. Cat. 14. 1888. *Dolichos regularis* L., Sp. Pl. 2: 726. 1753. Lectotype (designated by Duncan 1979): USA, “Virginia” [which included several states west and northwest of current day Virginia], *Clayton 121* (BM). Figs. 30–32.

Galactia volubilis (L.) Britton var. *mississippiensis* Vail, Bull. Torrey Bot. Club 22: 508. 1895. *Galactia mississippiensis* (Vail) Rydb., Fl. Plains N. Amer. 493. 1932. Type: not designated.

Galactia regularis is slowly being more consistently applied after Duncan (1979) characterized its type specimen. The only cited element of *Dolichos regularis* (= *G. regularis*) was “Gorn. virg. 82. Habitat in Virginia.” The abbreviation “Gorn.” is a typographic error for Gron. or Gronovius (Nesom 2015). In Gronovius (1743: 82–83) is cited one specimen, *Clayton 121*, which is extant at BM, and Duncan (1979: 173) has been credited (Jarvis 2007: 484) with identifying it as the type specimen (lectotype). On the specimen are Latin and English descriptions and a direct citation of Gronovius (1743: 82), all evidently in the handwriting of Gronovius (Burdet s.d.).

This lectotype exhibits a twining stem and mostly elliptic leaves, broadest near the middle and rounded at both ends. Duncan (1979: 173) noted the lectotype of *G. regularis* to have “soft and spreading” hairs on the stem and its one seemingly mature flower to measure 8 mm long. Based on this Duncan realized that *G. regularis* had largely been misapplied to specimens with larger corollas and appressed stem vestiture (e.g. Rogers 1949; Isely 1998), and that the stem hairs of *G. regularis* were “uncommonly retrorse appressed.” The concept of *G. mississippiensis* in Rogers (1949) seems mostly congruent with *G. regularis* in that the stem is described as having “pubescence dense, spreading or retrorse” and its distribution is mostly inland in the coastal plain.

The delimitation of *G. regularis* and *G. volubilis* is still nebulous, partly because previous interpretations of *G. volubilis* have conflicted with its lectotype. *Galactia volubilis* has been interpreted as usually having appressed stem vestiture, while its lectotype illustration is retrorsely hirsute. Additional study is needed to compare *G. regularis* and *G. volubilis* across their range, bearing in mind the necessity of matching taxonomic concepts to their type specimens.

The current interpretation of *G. regularis*, i.e. strictly similar to the lectotype (spreading hairs [Fig. 31] and flowers to 9 mm), suggests it is rare to absent in coastal areas and in peninsular Florida, which is mostly consistent with Duncan (1979) and Nesom (2015) except that both cited several specimens from Florida, Duncan mostly from north Florida and Nesom throughout the peninsula. No

specimens from Florida that I have seen (Appendix 1) have the villous spreading (non-retrorse) hairs on the stem and short flowers clearly attributable to *G. regularis* s.s. Presumably, the southernmost specimens that Duncan and Nesom regarded as *G. regularis*, I am treating as *G. volubilis* (i.e. that retrorsely hirsute hairs are common in *G. volubilis*, consistent with its Dillenius lectotype). Some specimens in Florida that are retrorsely hirsute-villous with small flowers perhaps should be called *G. regularis*, e.g. *Sauleda & Ragan 5227* from Marion Co., FL. Again, the ambiguous separation between these taxa is problematic and additional observations are needed.

Forms with small flowers and elliptic leaves but retrorsely appressed hairs are here tentatively attributed to *G. regularis* and occur in north Florida (Appendix 1). In the panhandle, it may only be marginally separable from *G. microphylla* and *G. minor* which both have comparatively leafy stems. Further research is needed to determine the appropriate taxonomy for the specimens with appressed stem vestiture found in Florida that are here identified as *G. regularis* (Appendix 1). The unambiguous presence of *G. regularis* in Florida requires further study (and a veritable distinction from other taxa), especially in north Florida and the panhandle. Of the few cited specimens of *G. regularis* outside of Florida studied here (Appendix 1), most are villous with distinctly spreading hairs and do not show a retrorse pattern. However, *Hill 34955*, is villous and retrorse-spreading, with flowers ca. 9 mm long, and is here considered *G. regularis*.

Galactia smallii H. J. Rogers ex Herndon, *Rhodora* 83: 471. 1981. *Galactia prostrata* Small, Man. S.E. Fl. 719, 1505. 1933, nom. illeg. Lectotype (designated by Nesom 2015): USA, Florida, Miami-Dade Co., Redlands district, pinelands, 13 May 1918, *Small 8633* (NY; isolectotype, FLAS). Figs. 33–36.

Perhaps the rarest species of *Galactia* in the southeast USA is *G. smallii* (or perhaps *G. brachypoda*). *Galactia smallii* is markedly similar to *G. floridana*, both with predominantly villous stems (Fig. 34). *Galactia smallii*, a pine rockland species, is only marginally distinct by its inflorescences more pronouncedly exerted beyond the smaller leaflets, the leaflets with more conspicuous reticulate venation adaxially and abaxially, and the reticulate venation as pronounced as the secondary venation adaxially. *Galactia floridana* and *G. smallii* are separated by over 150 km. Two specimens, *Woodmansee & Hoffman 30* (FTG, USF) and *Small & Mosier s.n.* (FTG, acc. no. 93418), seem to approach *G. pinetorum* in that they are not densely villous but are somewhat antrorsely pilose.

Galactia striata (Jacq.) Urb., *Symb. Antill.* 2: 320. 1900. *Glycine striata* Jacq., *Hort. Bot. Vindob.* 1: 32. 1771. Lectotype (designated by Nesom 2015): *Hort. Bot. Vindob.* 1: pl. 76. 1771. Figs. 37–38.

Galactia cubensis Kunth, *Nov. Gen. Sp.* 6: 429. 1823. *Galactia filiformis* (Jacq.) Benth. var. *cubensis* (Kunth) M. Gómez, *Anales Soc. Esp. Hist. Nat.* 23: 296. 1895. *Galactia striata* (Jacq.) Urb. var. *cubensis* (Kunth) Urb., *Symb. Antill.* 2: 322. 1900. Type: Cuba, Havana, *Bonpland Humboldt s.n.* (holotype, P [P00660121]).

Galactia spiciformis Torr. & A. Gray, *Fl. N. Amer.* 1: 288. 1838. Lectotype (designated here): USA, Florida, Monroe Co., Key West, *Bennett s.n.* (NY [00008142]; isolectotype, GH [00066217]).

Galactia filiformis sensu Chapman, *Fl. South. U.S.* 118. 1897, non *Galactia filiformis* (Jacq.) Benth., *Comm. Legum. Gen.* 63. 1837 (= *Galega filiformis* Jacq., *Collectanea* 2: 348. 1789.) (fide Acevedo-Rodríguez & Strong 2012). Type of *Galega filiformis* at BM?

The only species currently considered here to occur in both Florida and the West Indies is *G. striata*. This species has been reported from the central-east coast of Florida (Nesom 2015), but no vouchers have been seen by the present author. Since type specimens of *G. spiciformis* exist both at NY (the presumed repository of Torrey) and GH (the presumed repository of Gray), the name is here lectotypified in accord with Rogers (1949: 106).

Galactia volubilis (L.) Britton, Mem. Torrey Bot. Club 5: 208. 1894. *Hedysarum volubile* L., Sp. Pl. 2: 750. 1753, non *Ervum volubile* Walter. Lectotype (designated by Reveal & Jarvis 2009): Dillenius, Hort. Eltham 1: pl. 143, fig. 170. Figs. 39–42.

Galactia macreei M.A. Curtis, Boston J. Nat. Hist. 1: 120. 1835. *Galactia pilosa* Nutt. var. *macreei* (M.A. Curtis) Torr. & A. Gray, Fl. N. Amer. 1: 287. 1838. Type: USA, North Carolina, Curtis s.n. (probable holotype, GH).

Galactia pilosa Nutt. var. *angustifolia* Torr. & A. Gray, Fl. N. Amer. 1: 287. 1838. Type: not located or designated.

Like *G. regularis*, the delimitation of *G. volubilis* is slowly becoming more consistent (Duncan 1979; Nesom 2015). There has been some discrepancy with regard to the retrorsely hirsute stem depicted on its lectotype (Duncan 1979; Nesom 2015), though it is regarded here as entirely accurate as numerous specimens of *G. volubilis* match the lectotype.

The cited elements of *Hedysarum volubile* (= *G. volubilis*) were Dillenius (1732: pl. 143, fig. 170), Linnaeus (1737: 499, no. 6), and Royen (1740: 385, no. 4). Both Linnaeus (1737: 499) and Royen (1740: 385) in turn only cited the same illustration (Dillenius 1732: pl. 143, fig. 170), which was designated the lectotype by Reveal & Jarvis (2009: 979). The application of *G. volubilis* must rely on Dillenius (1732: 173–174, pl. 143, fig. 170) and should assume an accurate description and depiction (Tjaden 1986), i.e. with a retrorsely hirsute stem, well-spaced inflorescence nodes, twining habit, and glaucescent lanceolate-ovate leaflets. There is no reason to suggest Dillenius was misrepresenting what he saw nor that retrorsely hirsute stems are atypical of *G. volubilis* (Duncan 1979; Nesom 2015).

Duncan's (1979) interpretation of *G. volubilis* relied on an uncited specimen at OXF (Nesom 2015: Fig. 5) labeled “*Hedysarum trifoliatum scandens folio longiore splendente[,] H Elth 1534 1748[.]*” The Latin phrase and number “1748” was probably added by Humphrey Sibthorp (1713–1797) (Druce & Vines 1897: 8) and appear consistent with his handwriting (Burdet s.d.). Sibthorp may have been responsible for the numbers in the upper right corner (“143 170 173”) as another reference to Dillenius (1732). The number “173” presumably refers to the plant with the exact same Latin phrase “*Hedysarum trifoliatum [...]*” (Dillenius 1732: 173) with “143” and “170” identifying the associated illustration also having the exact same Latin phrase (Dillenius 1732: pl. 143, fig. 170). Stamped in the lower right corner is “Herb Sherard America” (probably added during the Druce & Vines (1897, 1907) period; Stephen Harris, pers. comm.). William Baxter (1787–1871) probably added “1534” as a sort of “Sherard Herbarium identifying number” (see Brandenburg et al. 1987; McMillan & Blackwell 2013).

There is no indication this specimen at OXF annotated by Sibthorp is a typo, i.e. the specimen the lectotype illustration was based on. It is possible that “1748” marks the date the specimen

was prepared by Sibthorp (Nesom 2015; S. Harris, pers. comm.). The year 1748 postdates Sherard's death in 1728, Dillenius (1732), and Dillenius' death in 1747. There is nothing matching the handwriting of Dillenius on the specimen (see "Linnaean Correspondence" for handwriting samples). The OXF specimen also does not bear a striking resemblance (i.e. a mirror image) in form to the illustration, as seen in other cases (see Brandenburg et al. 1987; Knapp & Jarvis 1990; Nesom 2004). As it stands, this OXF specimen cannot be used for the interpretation of the type specimen of *G. volubilis*, contrary to Duncan (1979).

Only the lectotype illustration (Dillenius 1732: pl. 143, fig. 170) and the supporting Latin descriptions (Dillenius 1732: 173–174) should be consulted for the application of *Hedysarum volubile*. Dillenius described the stem as "a sinistra dextrosom, scandentia" presumably indicating a twining habit that led to the Linnaean choice of the epithet *volubile*. The illustration exhibits lanceolate-ovate leaflets, broadest near the base, rounded at the base, and obtuse to acute at the apex. The leaflet undersides are described as "prona pallidiora and glaucescentia" (Dillenius 1732: 173). The maximum flower length is ca. 70% of the maximum leaflet width, which makes the flower seem rather small (10 mm long?) or the leaflets rather large. The inflorescence is exerted with nodes fairly well-spaced, such that the length to the second node of the inflorescence is subequal to the length from the base of the petiole to the middle of the terminal leaflet. The stem is illustrated with retrorsely hirsute hairs and is described as "tenuiter pilosa".

The majority of USF specimens cited below (Appendix 1), match perfectly well with the lectotype and its Latin descriptions, i.e. having obliquely retrorse hairs that are not strictly appressed on the stem, elongate and exerted inflorescences with well-spaced nodes, a twining habit, and glaucescent lanceolate-ovate leaflets (e.g. *Braem HI0078*, *Brass 20608*, *Caudle et al. 5292A*, *Caudle et al. 5292B*, *Caudle et al. 5744*, *Chicone 1086*, *Cole 116*, *Fleming 3606*, *Gandy DB0131*, *Long et al. 2328*, *Taylor et al. 4419*, *Woodbury & Roberts s.n. [255118]*, *Wunderlin 9737*). Specimens with more appressed hairs on the stem but otherwise similar to the above are also frequent (e.g. *Ahles & Duke 48133*, *Duncan 20351*, *Gandy MWSR0074*, *Long et al. 3339*). Stem hairs of few specimens cited below are nearly all strictly appressed, and it seems common for specimens to have some hairs retrorse on the stem at an oblique angle. Many specimens cited (Appendix 1) have flowers that are subequal to the maximum leaflet width (though perhaps the largest leaflets were simply not collected), while others with larger leaflets (*Ahles & Duke 48133*, *Ray 11156*, *Ray & Lakela 11028*, *Shuey s.n. [119813]*) have a similar flower size to leaflet width ratio as the Dillenius lectotype.

Based on the analysis of the lectotype and the cited specimens, the concept of *G. volubilis* must allow that stems with obliquely retrorse hairs are common on specimens (Fig. 40). Contrary to the Dillenius lectotype and the above-cited specimens, others have suggested appressed hairs are common and oblique hairs are relatively rare in their delimitation of *G. volubilis* (e.g. Duncan 1979; Nesom 2015). It was also suggested that the retrorsely hirsute hairs of the Dillenius lectotype actually represented *G. regularis* (Duncan 1979; Nesom 2015) or were inaccurate exaggerations (Nesom 2015). Given that their are multiple specimens (e.g. *Braem HI0078*, etc.) that are consistent with the lectotype, the depiction of the hairs on the stem should not be interpreted as an anomaly. It is viewed here that both oblique and appressed hairs (Figs. 40–41) on the stem can be found in *G. volubilis*. In this sense, the Sibthorp OXF specimen (Nesom 2015: Fig. 5) would be compatible with *G. volubilis*. Duncan also cited two specimens

that apparently exhibit retrorse-spreading hairs but still fit his sense of *G. volubilis*, *Ahles 15677* (NCU) and *Bozeman 2114* (GA).

Vail (1895: 507) observed that “This species is based on the Dillenius plate [...] and is most variable and difficult to define. The type specimen is evidently the larger leaved, long-racemed form that occurs principally from North Carolina to Florida on the coast”, consistent with the distributions in Duncan (1979), Nesom (2015), and here. As noted by Nesom (2015), the distinction between the more inland *G. regularis* and the more coastal *G. volubilis* is “subtle” and “intermediates are encountered.” The presumed holotype of *G. macreei* (Rogers 1949: 88, pl. 22) shows an inflorescence to ~25 cm long with well-spaced internodes, consistent with the concept of *G. volubilis*.

Some cited specimens (Appendix 1) do not seem typical of *G. volubilis*. One specimen, *Sauleda & Ragan 5227*, is retrorsely hirsute-villous, with small flowers measuring 8.2 mm long. Perhaps this specimen and other similar ones can be found in north Florida and should be called *G. regularis*. However, I hesitate to call *Sauleda & Ragan 5227* *G. regularis* until additional specimens in north Florida can corroborate a morphology consistent with *G. regularis*. *Ray et al. 10809* has retrorse appressed stem vestiture with small flowers measuring 9.1 mm long. *Slaughter & Minno 12653* and *vanHoek & O'Connor CI0136* are both rather densely retrorse hirsute-villous with flowers to 11 mm. *Popenoe 1689* has conspicuous reticulate venation as if approaching *G. pinetorum*, but its leaflets are light green and strongly glaucescent like *G. volubilis*. Nesom (2015: 25) noted two specimens (*Hattaway FS0211* and *Owen FS0210*) which have rather large leaflets with conspicuous pale secondary venation abaxially and large fruits.

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Appendix 1. Specimens of trifoliolate *Galactia* examined. When no collection number is given, the barcode or accession number is provided in brackets. A question mark in brackets denotes uncertainty for the identification. All FTG and USF specimens were examined in person, while all other specimens were examined by digital image.

***G. austrofloridensis*:** Florida: Miami-Dade Co.: *Buswell s.n.* (FTG [93423, 93424]), *Craighead s.n.* (USF [47298]), *Lakela 30212* (USF), *Reimus 99* (FTG), *Small s.n.* (FTG [93366]), *Woodbury s.n.* (FTG [93426]); Monroe Co.: *Anderson 14640* (FSU), *Gann & Bradley 498* (FTG), *Gann & Bradley 554* (FTG), *Hansen & Richardson 11448* (USF), *Karl 9* (FTG), *Koptur et al. 978, 979, 980, 981, and 982* (FTG), *Lakela 32215* (USF), *Lakela 32215A* (USF), *Lakela & Craighead 29286* (USF), *Long & Broome 2453* (USF), *Long et al. 2014* (USF), *Poppleton & Shuey s.n.* (USF [116881]), *Robertson, Jr. s.n.* (FTG [65630, 65663]), *Sauleda & Sauleda 7039* (USF). ***G. brachypoda*:** Florida: Gulf Co.: *Chapman s.n.* (MO [acc. no. 793008, mixed collection, left specimen only]). Georgia: Baker Co.: *Anderson 15642* (FSU [2 sheets], GA); Colquitt Co.: *Duncan et al. 17113* (GA). ***G. erecta*:** Alabama: Mobile Co.: *Kral 39604* (JSU). Florida: *Chapman s.n.* (MO [216309]); Calhoun Co.: *Chapman s.n.* (MO [216310]); Clay Co.: *Orzell & Bridges 20102* (USF); Gulf Co.: *Chapman s.n.* (MO [acc. no. 793008, mixed collection, middle and right

specimens only]); Liberty Co.: *Orzell & Bridges 19583* (FLAS, USF); Okaloosa Co.: *Carr 2014* (FLAS); Santa Rosa Co.: *Orzell & Bridges 14271* (USF). Georgia: Toombs Co.: *Duncan & Hardin 17925* (GA); Worth Co.: *Orzell & Bridges 20535* (FTG). Mississippi: George Co.: *Demaree 33419* (USF). North Carolina: Palmlico Co.: *Radford 35976* (USF). Wilmington Co.: *Williamson s.n.* (USF [93768, 93769]). **G. floridana**: Florida: Alachua Co.: *Sauleda 5245* (USF); Charlotte Co.: *Gandy CH0007* (USF), *Wunderlin et al. 10717* (USF); Citrus Co.: *Genelle & Fleming 1535* (USF), *Hattaway FC0133* (USF), *Kral 7878* (USF), *Lakela 25166* (USF), *Lakela 25280* (USF), *Mawhinney 243* (USF), *Mawhinney 280* (USF), *Schmid A-450* (FTG, USF); DeSoto Co.: *Franck 1218* (USF); Hernando Co.: *Genelle & Fleming 927* (USF), *Lakela 24476* (USF), *Lakela 24493* (USF), *Lakela 25304* (USF), *Ray 9352* (USF), *Ray 9355* (USF), *Ray 9360* (USF), *Ray 9552* (USF); Hillsborough Co.: *Chevalier & Sreemadhavan s.n.* (USF [105237]), *Graham HR0056* (USF), *Hilsenbeck & Stenholm 17* (USF), *Lakela 25359* (FTG, USF), *Lakela 25360* (USF), *Lakela 25376* (USF), *Lakela 25377* (USF), *Lakela 30270* (USF), *Lakela 30273* (USF), *Landry & Vandaveer s.n.* (USF [222074, 223574]), *Myers 356* (USF), *Myers 691* (USF), *Ray & Lakela 10209* (USF), *Sauleda 2917* (FTG), *Schmidt 54* (FTG, USF), *vanHoek HR0639* (USF); Lake Co.: *Daubenmire & Daubenmire s.n.* (USF [179734]), *Kral 7650* (USF), *Gillis 6878* (FTG); Lee Co.: *Woodmansee & Green 1847* (FTG), *Buswell s.n.* (FTG [93140]); Levy Co.: *Orzell & Bridges 14522* (FTG); Manatee Co.: *Weber LM0040* (USF); Marion Co.: *Strong 4155* (USF); Orange Co.: *Wunderlin 5646* (USF); Pasco Co.: *Ferguson 357* (USF), *Ferguson 824* (USF), *Hood 3486* (USF), *Sauleda & Sauleda 5169* (FTG); Pinellas Co.: *Fleming 4121* (USF), *Hansen & Wunderlin 12371* (USF), *Lakela 25263* (FTG, USF), *Thorne 48584* (USF); Sumter Co.: *Strong 2093* (USF). **G. michauxii**: Florida: Brevard Co.: *Hansen et al. 11699* (USF), *Schmalzer Aug-48* (USF), *Chicone 901* (USF), *Blissett-Clark & de Seguin des Hons s.n.* (USF [260674]), *Kennedy & Robinson 492* (USF), *MacClendon et al. 66* (USF), *MacClendon & Weichman 185* (USF); Broward Co.: *Howell 1022* (USF); Clay Co.: *Hansen & Richardson 5476* (USF), *Bridges & Orzell 23795* (USF), *Kunzer 2200* (USF); Collier Co.: *Craighead s.n.* (USF [67480]), *Lakela 28732* (USF), *Lakela 28958* (USF), *Lakela 28965* (USF), *Lakela 30825* (USF), *Lakela 30956* (FTG, USF), *Lakela 31093* (USF); Columbia Co.: *Herring & Herring 345* (USF), *Orzell & Bridges 25481* (USF); DeSoto Co.: *Shuey 2182* (USF); Glades Co.: *Franck 1478* (USF); Hendry Co.: *Sturtevant 156* (USF); Highlands Co.: *Hansen et al. 6414* (USF), *Hansen et al. 11624* (USF), *Lindsey & Upchurch 848* (USF), *Correll & Correll 52323* (FTG, USF), *Brass 33236* (USF), *Lakela 25322* (FTG, USF), *Lakela 25321A* (USF), *Hattaway et al. LJ0013* (USF), *Wunderlin & Beckner 9124* (USF), *Wunderlin & Beckner 9144* (USF), *Cole & Becker HH0062* (USF), *Christman & Simons 693* (USF); Hillsborough Co.: *Farid et al. 111* (USF), *Shuey s.n.* (USF [119854]), *Ray et al. 10135* (USF), *Myers & Myers 455* (USF), *Lakela 25894* (USF), *Lakela 29762* (USF), *Wunderlin 10688* (USF), *Landry & Vandaveer s.n.* (USF [222125]), *Ducey 126* (USF); Indian River Co.: *Bradley & Woodmansee 1108* (FTG, USF); Lake Co.: *Strong 3128* (USF), *Daubenmire & Daubenmire s.n.* (USF [203331, 239503]), *Mejeur & Walker 902* (USF); Lee Co.: *Lakela 26980* (USF), *Chicone 736* (USF), *Cole KS0025* (USF), *Woodmansee & Green 1847* (USF), *Buswell s.n.* (FTG [92935, 92936, 92939, 92940]); Levy Co.: *Skean, Jr. 843* (USF); Manatee Co.: *Becker WC0231* (USF), *Becker & Hattaway WC0311* (USF), *Dodson 8063* (USF), *Norman & Norman LM0017* (USF), *Sauleda 5037* (FTG); Marion Co.: *Martin & Cooper 477* (USF), *Martin & Cooper 774* (USF), *Long et al. 3660* (USF), *Long et al. 3661* (USF); Martin Co.: *Ray & Lakela 11087* (USF), *Popenoe & Roberts 1411* (FTG, USF), *Popenoe & Roberts 1423* (FTG), *Correll & Popenoe 48625* (FTG), *Popenoe & Popenoe 662* (FTG), *Popenoe 729* (FTG), *Popenoe et al. 1790* (FTG), *Bradley & Woodmansee 1158* (FTG), *Woodbury & Roberts s.n.* (USF [257473, 257477]); Monroe Co.: *LeDoux & Pries 450* (USF); Nassau Co.: *Longbottom 24749* (USF), *Longbottom 24751* (USF);

Okeechobee Co.: *Hansen & Robinson 8446* (USF); Orange Co.: *Popenoe 2447* (FTG, USF), *Baker s.n.* (FTG [92932]), *Buswell s.n.* (FTG [92934]), *Lakela 25988* (USF), *Wunderlin et al. 5516* (USF); Palm Beach Co.: *Lakela 24958* (USF), *Lakela 24959* (USF), *Staples III 109* (FTG); Pasco Co.: *Ferguson & Kunzer 767* (USF), *Ferguson & Kunzer 784* (USF), *Ferguson & Kunzer 854* (USF); Pinellas Co.: *Hansen et al. 12281* (USF), *Genelle & Fleming 284* (USF), *Genelle & Fleming 681* (FTG, USF), *Genelle & Fleming 2424* (USF); Polk Co.: *Hansen & Richardson 6156* (USF), *Hansen et al. 11377* (USF), *vanHoek & Wargo 915* (USF), *Lindsey & Upchurch 982* (USF), *Campbell 51* (USF), *Lakela 24180* (USF), *Lakela 24553* (USF), *Lakela 24557* (USF), *Lakela 24567* (USF), *Lakela 25149* (USF); Sarasota Co.: *Perkins s.n.* (USF [2876, 2877]), *Franck 163* (USF), *Holst et al. 5034* (USF), *Cole & Dunk OS0165* (USF); St. Johns Co.: *Slaughter 14217* (FTG); St. Lucie Co.: *Lakela 25379* (FTG, USF); Union Co.: *Williams & Williams 3821* (USF), *Sauleda 5313* (USF); Volusia Co.: *Ames 511* (FTG), *Slaughter 12417* (FTG), *Hansen & Richardson 5603* (USF), *Longbottom 12743* (USF). Georgia: Richmond Co.: *Jones 15132* (USF). North Carolina: Carteret Co.: *Grier & Czikowsky s.n.* (USF [84152]). Wayne Co.: *Duke 1027* (USF). South Carolina: Aiken Co.: *Hill & Wilson 22378* (USF); Jasper Co.: *Aulbach-Smith et al. 2682* (USF), *Daoud 49* (USF). Virginia: Nansemond Co.: *Kral 11078* (USF); Sussex Co.: *Seymour 91 7 20* (USF). **G. microphylla**: Florida: Escambia Co.: *Carlton s.n.* (USF [162778]). Gulf Co.: *Orzell & Bridges 15340* (FTG); Okaloosa Co.: *Godfrey 68914* (FSU); Santa Rosa Co.: *Crewz 1136* (USF). **G. minor**: Alabama: Baldwin Co.: *Kral 35773* (USF); Florida: Bay Co.: *Grey s.n.* (USF [233066]); Escambia Co.: *Kral & Godfrey 6064* (USF); Santa Rosa Co.: *Barghoorn 29* (USF); Washington Co.: *Keppner s.n.* (FSU [206328]). Georgia: McIntosh Co.: *Bozeman 1064* (USF); Randolph Co.: *Orzell & Bridges 18043* (FTG). Louisiana: Cameron Par.: *McKenzie 264* (LSU) [?]. Mississippi: George Co.: *Demaree 33492* (USF); Harrison Co.: *Demaree 32398* (USF), *Demaree 32436A* (USF), *Ray 2932* (USF); Jackson Co.: *Demaree 33933* (USF). **G. mollis**: Alabama: Bullock Co.: *Dykes 1631* (TROY, UWAL), *Diamond 19425* (TROY). Florida: Alachua Co.: *Holland & Mears s.n.* (USF [204224]), *Zomlefer 629* (FTG); Clay Co.: *Orzell & Bridges 20107* (USF), *Sauleda & Ragan 5606* (FTG, USF); Flagler Co.: *Popenoe et al. 1729* (FTG); Hillsborough Co.: *Lakela 25133* (USF), *Lakela 25144* (USF), *Lakela 25193* (USF); Lake Co.: *Daubenmire & Daubenmire s.n.* (USF [179710]), *Mejeur & Walker 901* (USF), *Nash 880* (NY), *Taylor s.n.* (USF [208399]), *Baker s.n.* (FTG [93395]); Marion Co.: *Hubbard 570* (USF), *Long et al. 3663* (USF); Orange Co.: *Buswell s.n.* (FTG [93399]); Polk Co.: *Buswell s.n.* (FTG [93398]); Sumter Co.: *Wunderlin et al. 9783*; Suwannee Co.: *Herring & Herring 862* (USF); Volusia Co.: *Ames 509* (FTG), *Ames 515* (FTG); Wakulla Co.: *Anderson 23888* (FSU). Georgia: Baker Co.: *Anderson 15645* (FSU). North Carolina: Cumberland Co.: *Ahles & Haesloop 29747* (FSU, USF). South Carolina: Williamsburg Co.: *Orzell & Bridges 24965* (USF). **G. pinetorum**: Florida: Miami-Dade Co.: *Austin & Nauman 6935* (FTG), *Austin & Nauman 6939* (FTG), *Avery 1187* (FTG), *Bradley 713* (FTG), *Bradley 1653* (FTG), *Bradley 1670* (FTG, USF), *Britton s.n.* (USF[192046]), *Broome s.n.* (USF [75281, 75282, 76482]), *Buswell s.n.* (FTG [93400, 93401, 93402, 93404, 93406, 93411, 93416]), *Correll 49925* (FTG), *Craighead s.n.* (USF [47273]), *Craighead 719* (FTG), *Eaton 987* (USF), *Fawcett s.n.* (FTG [23455]), *Hill 2979* (FTG), *Hood s.n.* (FLAS [48749]), *Lakela 27269* (USF), *Lakela 28773* (USF), *Lakela 28438* (USF), *Lakela & Craighead 25734* (USF), *Lakela & Long 29704* (USF), *Moldenke s.n.* (FTG [92938]), *Nauman & Austin 770* (FTG), *Nauman & Austin 774* (FTG), *Nauman & Austin 777* (FTG), *Possley & Fellos 15* (FTG), *Skinner s.n.* (FTG [161913]), *Small s.n.* (USF [17695]), *Small s.n.* (FTG [93405]), *Small & Mosier s.n.* (FTG [93403]), *Small & Mosier s.n.* (FTG [93149]), *Woessner 175* (FTG), *Woessner s.n.* (FTG [93407]), *Woodbury s.n.* (FTG [93411]). **G. regularis**: Florida: Calhoun Co.: *MacClendon et al. 1304* (USF) [?]; Gadsden Co.: *Anderson 26557* (FSU) [?]; Jackson Co.: *Anglin s.n.* (USF [255832]) [?];

Jefferson Co.: *Godfrey 67374* (FSU) [?]. Georgia: Floyd Co.: *Duncan 17183* (USF). Illinois: Union Co.: *Hill 34955* (USF). Kentucky: Powell Co.: *Wharton 5705* (USF). Louisiana: Catahoula Par.: *Thomas et al. 10854* (USF); Union Par.: *Taylor et al. 4602* (USF). Mississippi: Jackson Co.: *Seymour 49* (USF); Lowndes Co.: *Ray 7324* (USF); Pike Co.: *Ray 5675* (USF); Wilkinson Co.: *Ray 5498* (USF). Missouri: Scott Co.: *Yatskievych et al. 15-124* (MO); Stoddard Co.: *Davidse 42569* (MO). New Jersey: Cape May Co.: *Brown s.n.* (USF [288430]). North Carolina: Durham Co.: *Biersacki s.n.* (FTG [35750]); Washington Co.: *Radford 38747* (USF). South Carolina: Union Co.: *Hill 25889* (USF). Tennessee: Rutherford Co.: *Hill 30684* (USF). **G. *smallii***: Florida: Miami-Dade Co.: *Avery 2164* (FTG, USF), *Avery 2229* (FTG, USF), *Franck 3923* (USF), *Lakela 28766* (USF), *Woodmansee & Hoffman 30* (FTG, USF), *Austin & Nauman 6928* (FTG), *Woodbury & Buswell s.n.* (FTG [03438]), *Woodbury s.n.* (FTG [93414]), *Fanning & McMahon 422* (FTG), *Avery 2096* (FTG), *Woodmansee 603* (FTG), *Small & Mosier s.n.* (FTG [93418]). **G. *striata***: Florida: Charlotte Co.: *Gandy CH0053* (USF); Collier Co.: *Correll & Popenoe 53229* (USF), *Lakela 29444* (USF), *Lakela 31240* (USF), *Lakela & Almeda 30094A* (USF), *Lakela & Laker 29095* (USF), *Lakela et al. 31404* (USF), *Long 1477* (USF); *Tuthill s.n.* (FTG [92943]) Lee Co.: *Brumbach 6594* (USF), *Brumbach 7724* (FTG, USF), *Hansen et al. 4997* (USF), *Todd 91* (USF), *Wunderlin et al. 6109* (USF), *Wunderlin et al. 6249* (USF); Miami-Dade Co.: *Long et al. 1918* (USF), *Buswell s.n.* (FTG [03439]), *Bradley 1347* (FTG); Monroe Co.: *Aregood 115* (USF), *Byrd s.n.* (USF [286016]), *Carlton s.n.* (USF [162541]), *Craighead s.n.* (USF [64181]), *Cooley et al. 6221* (USF), *Cooley et al. 9250* (USF), *Correll & Long 40967A* (FTG), *Dawes & Croley s.n.* (USF [79386]), *Hansen & Richardson 11443* (USF), *Hansen et al. 10670* (USF), *Hetzell 41* (USF), *Lakela 27847* (USF), *Lakela et al. 28623* (USF), *Lakela et al. 31780* (USF), *LeDoux & Pries 485* (USF), *Long 2010* (USF), *Long 3012* (USF), *Long & Broome 2479* (USF), *Long & Wunderlin 4086* (USF), *Long et al. 1819* (USF), *Long et al. 2805* (USF), *Long et al. 2686* (USF), *Longbottom & Williams 5465* (USF), *Poppleton 790* (USF), *Poppleton & Shuey s.n.* (USF [116316]), *Stalter 82* (USF); Sarasota Co.: *Lakela & Long 27559* (USF). **G. *volubilis***: Florida: Brevard Co.: *Shuey M0168* (USF), *Shuey & Poppleton s.n.* (USF [125434]), *Hansen 11895* (USF), *Poppleton M1468* (USF), *Lakela 27650* (USF), *Long et al. 2345* (USF), *Slaughter & Minno 12653* (FTG); Broward Co.: *Howell 946* (USF), *Howell 1302* (USF), *Tabb s.n.* (FTG [122181]); Charlotte Co.: *Franck 2823* (USF); Citrus Co.: *Williams & Longbottom 3116* (USF), *Ray & Lakela 11028* (USF), *Schmid A449* (USF), *Schmid A-62* (USF), *Lakela et al. 26036* (USF), *Lakela et al. 30189* (USF); Collier Co.: *Hetzell 23* (USF), *Correll et al. 51775* (USF), *Owen FS0210* (USF), *Lakela & Laker 29135* (USF), *Hattaway FS0211* (USF), *Sauleda & Sauleda 8763* (USF), *Popenoe 1326* (FTG); Columbia Co.: *Amoroso & Tan 44* (USF), *Tan 22* (FTG); DeSoto Co.: *Fulton 32* (USF), *Fulton 172* (USF), *Fulton 327* (USF), *Franck 868* (USF); Gilchrist Co.: *Hansen et al. 10840* (USF); Hardee Co.: *Farid & O'Donovan 8* (USF), *Brass 20608* (USF), *Cole PC0035* (USF); Hernando Co.: *Hansen & Richardson 6220* (USF), *vanHoek 31* (USF), *Lakela 24437* (USF), *Lakela 24480* (FTG, USF), *Lakela 25302* (USF), *Genelle & Fleming 998* (USF); Hillsborough Co.: *Arcuri 252* (USF), *Arcuri 450* (USF), *Shuey s.n.* (USF [119813]), *Crutcher 3* (USF), *Caudle et al. 2413* (USF), *vanHoek & Parsons HR0587* (USF), *Crewz & Kutash 1469* (USF), *Lakela 26254* (USF), *Lakela 30130* (USF), *Chicone 1086* (USF), *Ducey 127* (USF); Indian River Co.: *Wunderlin & Beckner 6472* (USF), *Long et al. 3569* (USF), *Long et al. 3571* (USF), *Meagher 1458* (FTG); Jackson Co.: *Hansen & Essig 11460* (USF), *Godfrey & Gholson 81551* (FTG); Lafayette Co.: *Caudle et al. 5744* (USF), *Caudle et al. 5292A* (USF), *Caudle et al. 5292B* (USF); Lake Co.: *Hansen et al. 11912* (USF), *Daubenmire & Daubenmire s.n.* (USF [178025, 211485]), *Rochow s.n.* (USF [150710]); Lee Co.: *Radford & Leonard 45549* (NCU), *Hansen & Hansen 5676* (USF), *Brown s.n.* (USF [177018, 188017]), *Phillips et al. 200* (USF), *Anderson & Jamison LK0081* (USF), *Todd 45* (USF), *Braem GI0169*

(USF), *Webb et al.* 2 (USF), *Avery* 1948 (FTG); Leon Co.: *Godfrey* 72826 (TTRS); Levy Co.: *Hansen & Richardson* 5972 (USF), *Crewz & Wain* 1634 (USF), *Gulledge* 372 (USF), *Long et al.* 3339 (USF); Madison Co.: *Hansen & Essig* 11579 (USF); Manatee Co.: *Hansen & Hansen* 5803 (USF), *Becker WC0548* (USF), *Cole* 116 (USF); Marion Co.: *Sauleda & Ragan* 5227 (USF), *Wunderlin et al.* 9905 (USF); Martin Co.: *Woodbury & Roberts s.n.* (USF [255118]), *Woodmansee* 763 (FTG, USF); Miami-Dade Co.: *Lakela & Almeda* 31856 (USF), *Correll et al.* 50524 (FTG), *Popenoe* 1689 (FTG); Monroe Co.: *Byrd s.n.* (USF [286015]), *Wiggins* 20079 (USF), *Lakela & Long* 28581 (USF), *Lakela & Long* 28581 (USF), *Longbottom & Williams* 5448 (USF), *Correll & Correll* 50358 (FTG); Nassau Co.: *Popenoe* 2080 (FTG, USF); Orange Co.: *Cheak* 74 (USF); Palm Beach Co.: *Hansen et al.* 7119 (USF); Pasco Co.: *Hansen et al.* 9896 (USF); Pinellas Co.: *Hansen et al.* 12807 (USF), *vanHoek & O'Connor CI0136* (USF), *Hilbert* 136 (USF), *Fleming* 3281 (USF), *Fleming* 3606 (USF), *Fowler* 57 (USF), *Lakela et al.* 26315 (USF), *Lakela* 26707 (USF), *Lakela* 27363 (USF), *Genelle & Fleming* 3212 (USF), *Braem HI0078* (USF), *Perkins et al.* 56 (USF), *Woodbury s.n.* (FTG [92927]); Polk Co.: *Conard s.n.* (USF [66368, 76515]), *Gilbert s.n.* (USF [288224]), *Jennings & Jennings s.n.* (USF [55696]), *Rochow s.n.* (USF); Sarasota Co.: *Dodson* 4627 (USF), *Gandy MWSR0074* (USF); Seminole Co.: *Williams* 3301 (USF), *Williams* 3304 (USF); St. Lucie Co.: *Hansen et al.* 7131 (FTG, USF), *Lakela* 25233 (USF), *Wunderlin et al.* 10157 (USF); Sumter Co.: *Hansen & Robinson* 9612 (FTG, USF), *Gandy DB0131* (USF), *Wunderlin et al.* 9737 (USF), *Rochow s.n.* (USF [150713, 153773]); Volusia Co.: *Hansen & Robinson* 8264 (USF), *Kunzer* 1921 (USF), *Correll & Correll* 52748 (FTG, USF), *Ray et al.* 10809 (USF), *Ray* 11156 (USF), *Long et al.* 2322 (USF), *Long et al.* 2328 (USF), *Longbottom* 16316 (NY, USF). Louisiana: Caldwell Par.: *Taylor et al.* 4419 (USF); Union Par.: *Taylor et al.* 4592a (USF). Georgia: Long Co.: *Bozeman* 2114 (GA); McIntosh Co.: *Duncan* 20351 (USF). Mississippi: Hancock Co.: *Hermann* 398 (USF); Jackson Co.: *Demaree* 36052 (USF). North Carolina: Pasquotank Co.: *Ahles & Duke* 48133 (USF).

Appendix 2. Figures 1–42. The blue ruler in the photos is in millimeter increments.

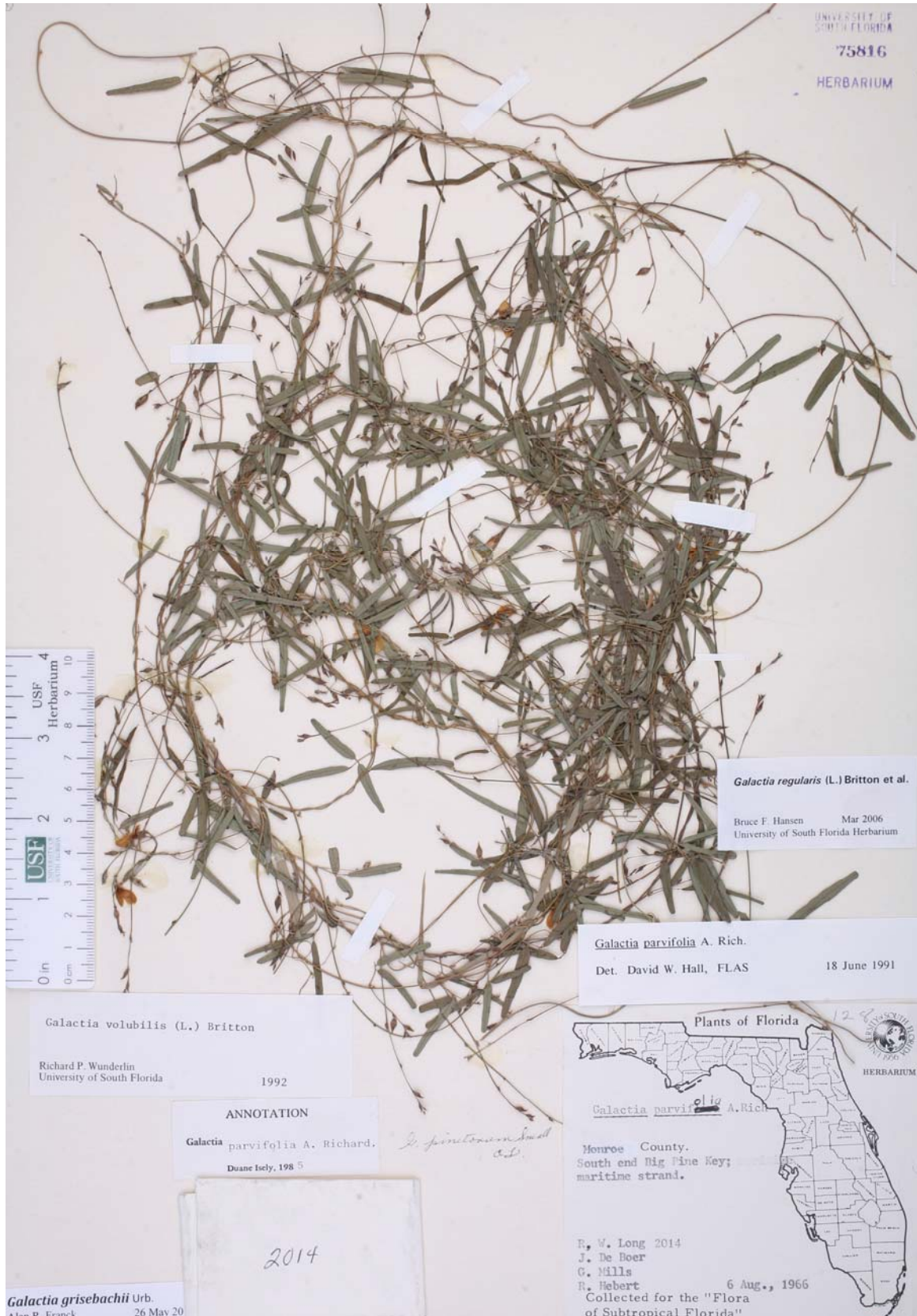


Figure 1. Holotype of *Galactia austrofloridensis* (Long et al. 2014).



Figure 2. *Galactia austrofloridensis* (Lakela 30212).

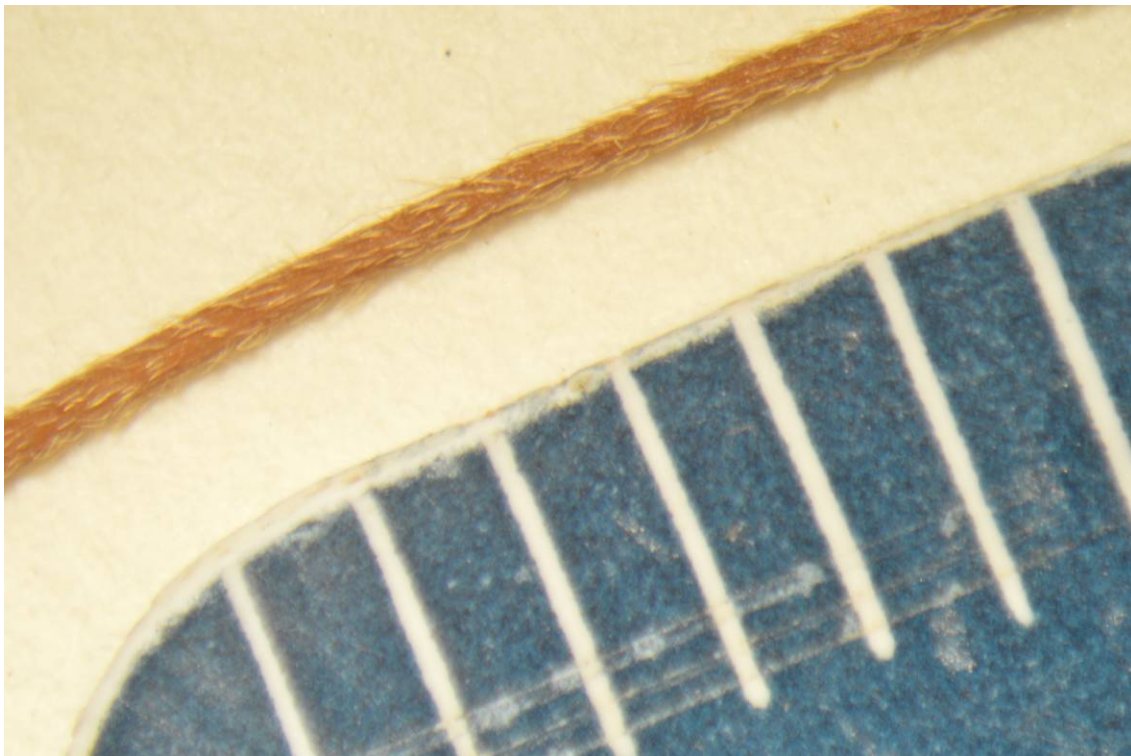


Figure 3. *Galactia austrofloridensis*, with a retrorsely strigose stem (Saulea & Saulea 7039). The distal portion of the stem is towards the upper right.

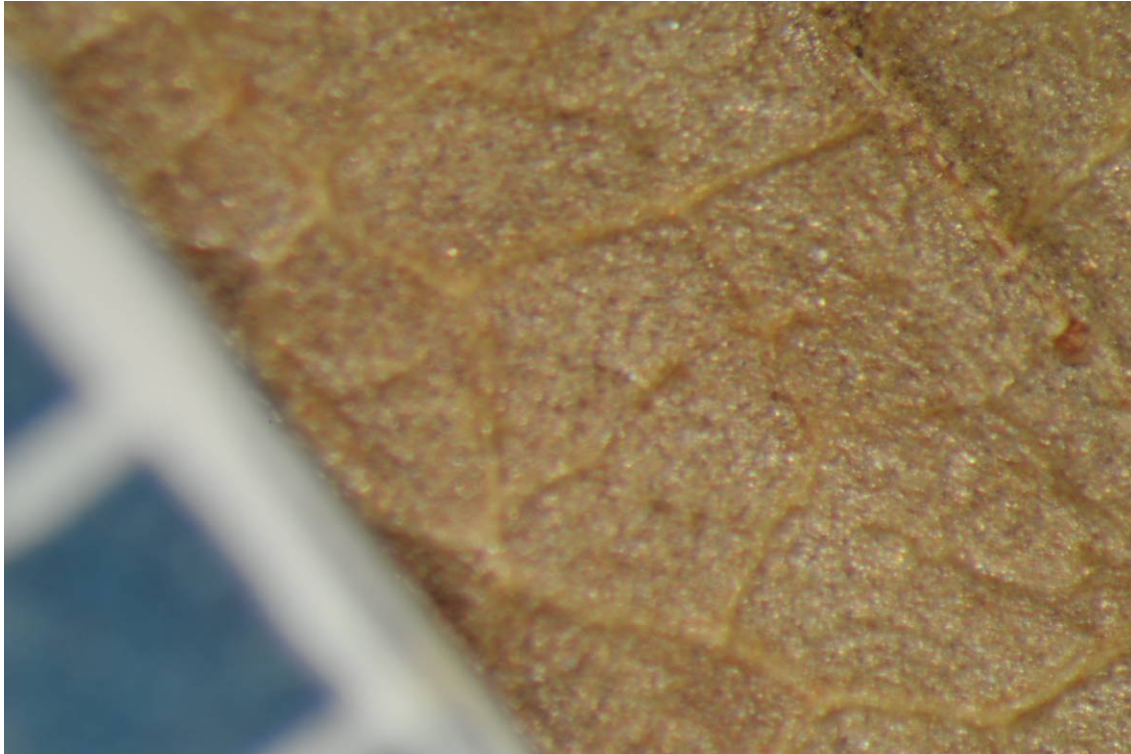


Figure 4. *Galactia austrofloridensis*, with a few pellucid dots confined to the midrib of the leaflet (Craighead s.n. [47298]).



Figure 5. *Galactia austrofloridensis*, seed attached to the fruit (Lakela 32215A).



Figure 6. Probable holotype of *Galactia brachypoda* (NY, 00008088). This image belongs to The C. V. Starr Virtual Herbarium (<http://sweetgum.nybg.org/science/vh/>); used with permission.



Figure 7. *Galactia brachypoda* (Anderson 15642, FSU). Image courtesy of the Florida State University's Robert K. Godfrey Herbarium.



Figure 8. *Galactia erecta* (Williamson s.n. [93768]).

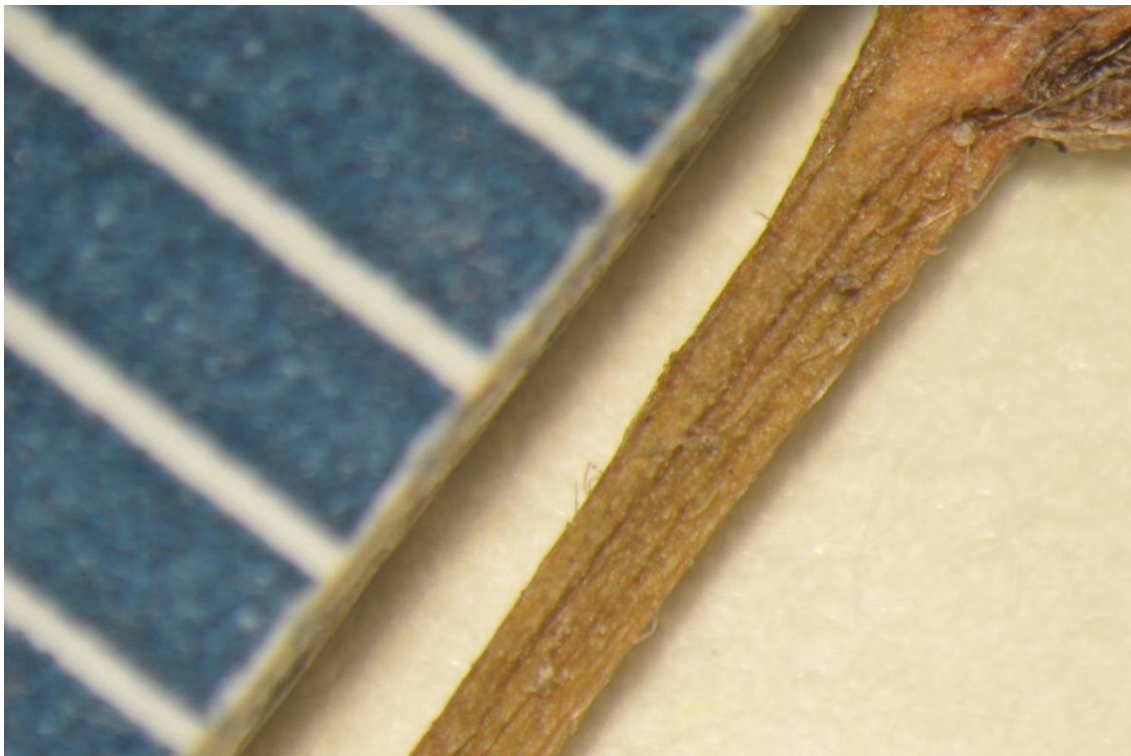


Figure 9. *Galactia erecta*, with an antrorsely sparsely strigose stem (Orzell & Bridges 20102). The distal portion of the stem is towards the upper right.



Figure 10. *Galactia floridana* (Franck 1218).

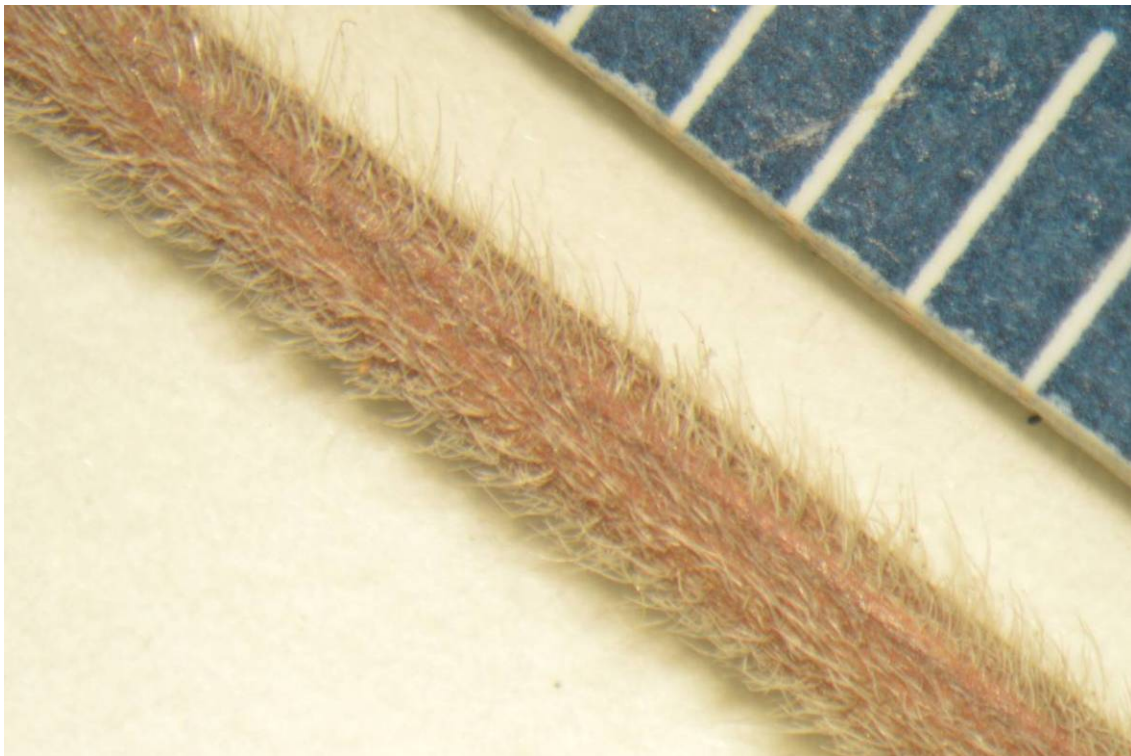


Figure 11. *Galactia floridana*, with an antrorsely villous stem (Myers 691). The distal portion of the stem is towards the upper left.

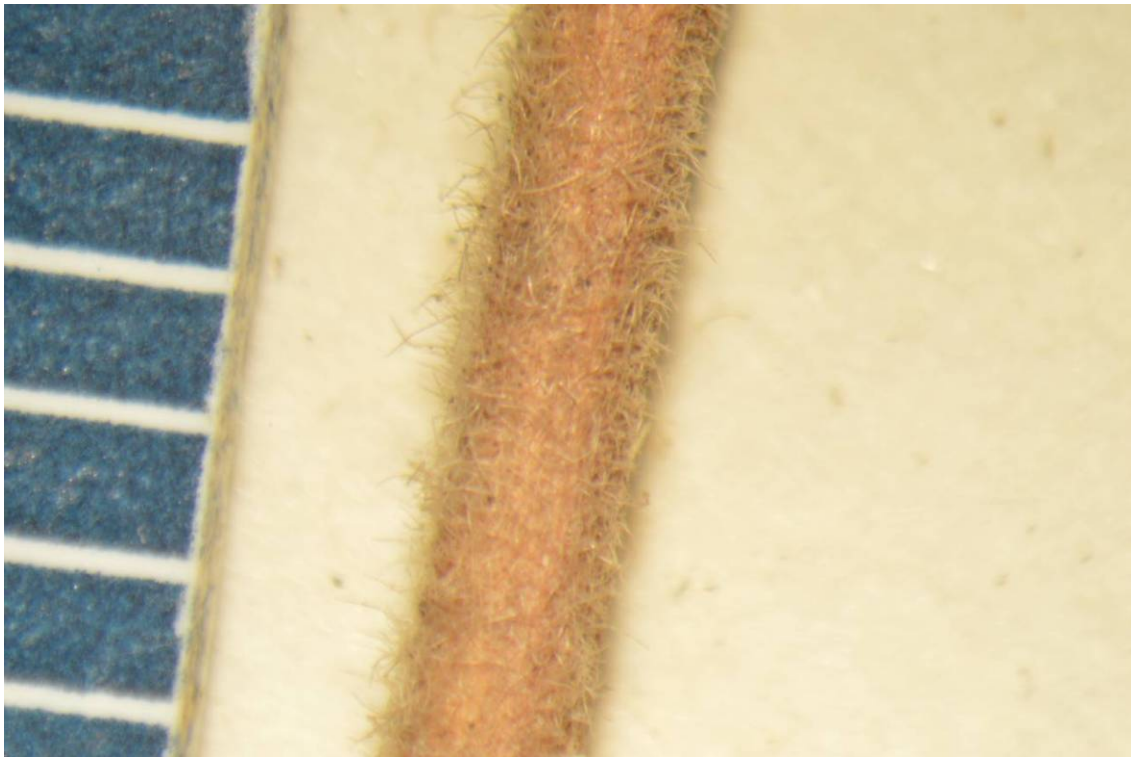


Figure 12. *Galactia floridana*, with a villous stem (Lakela 25359). The distal portion of the stem is towards the top.



Figure 13. *Galactia floridana*, seeds (Ray 9552).

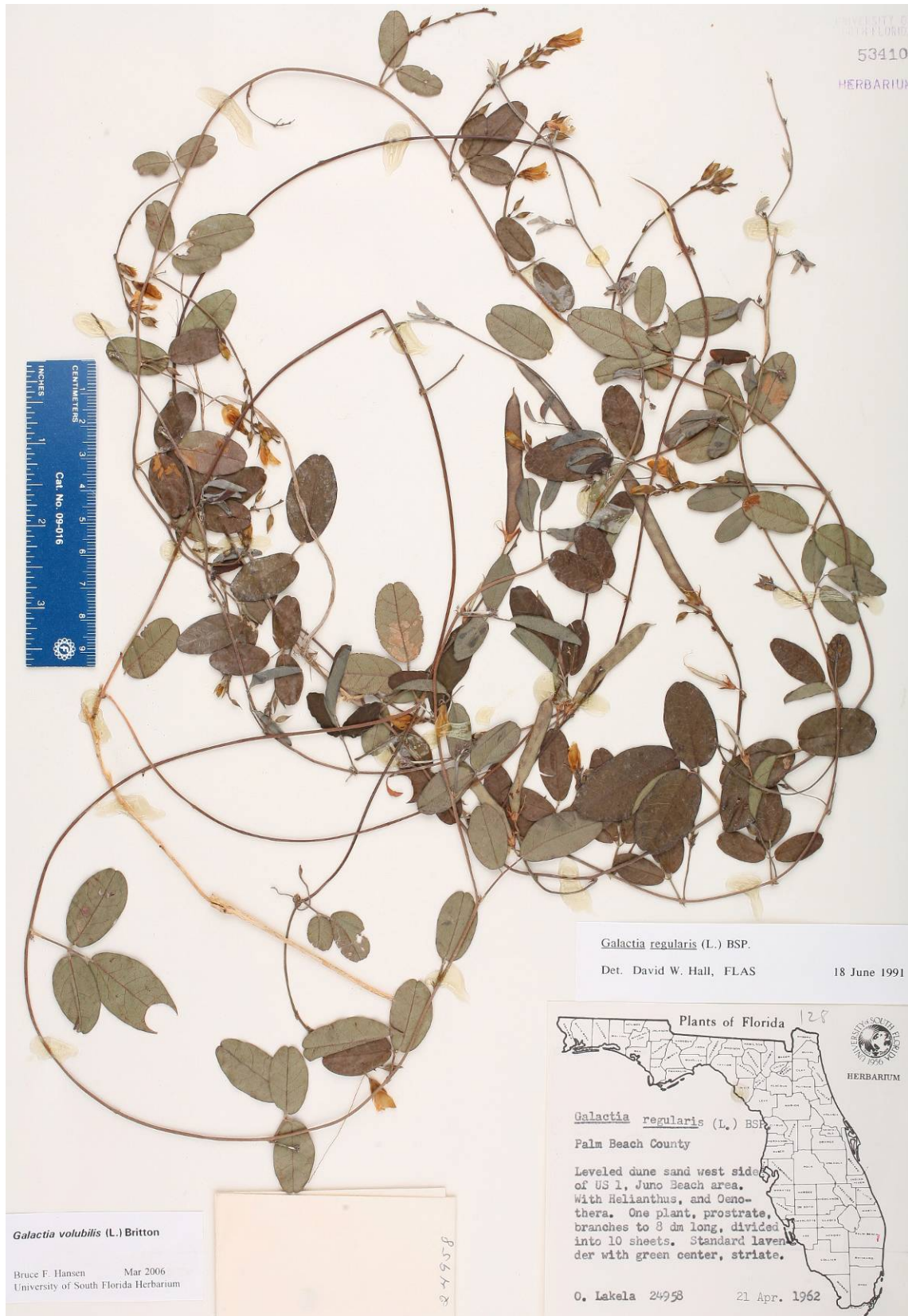


Figure 14. Holotype of *Galactia michauxii*, Lakela 24958 (USF).



Figure 14. *Galactia michauxii* (Longbottom 12743).

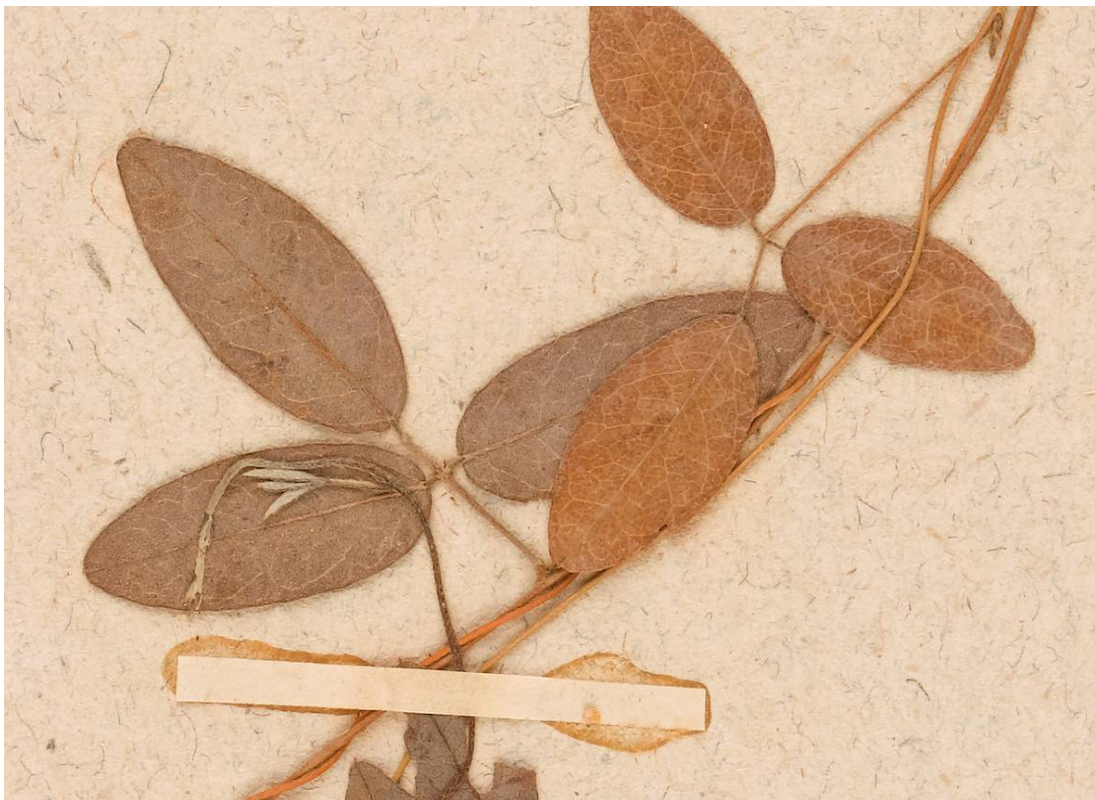


Figure 15. Possibly *Galactia michauxii*, and the likely intended type specimen of *G. glabella*, nom. illeg., at P, copyright MNHN - Herbar National.

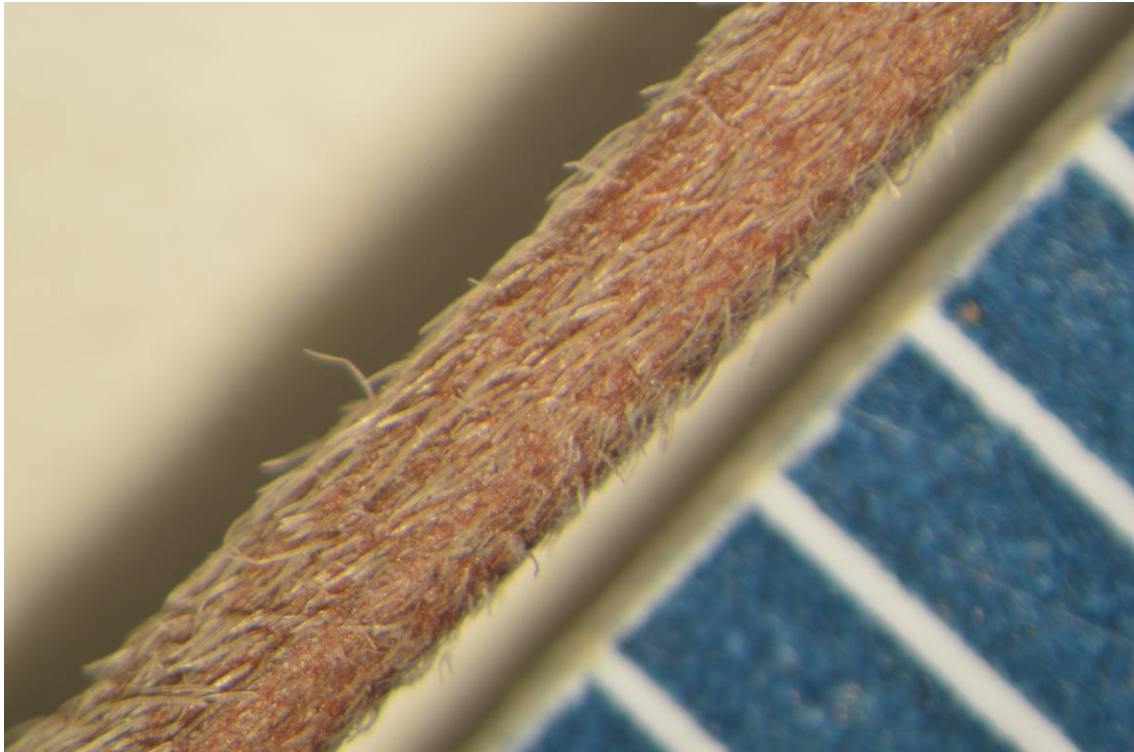


Figure 16. *Galactia michauxii*, with a retrorsely strigose stem (*Lakela 24958*). The distal portion of the stem is towards the upper right.

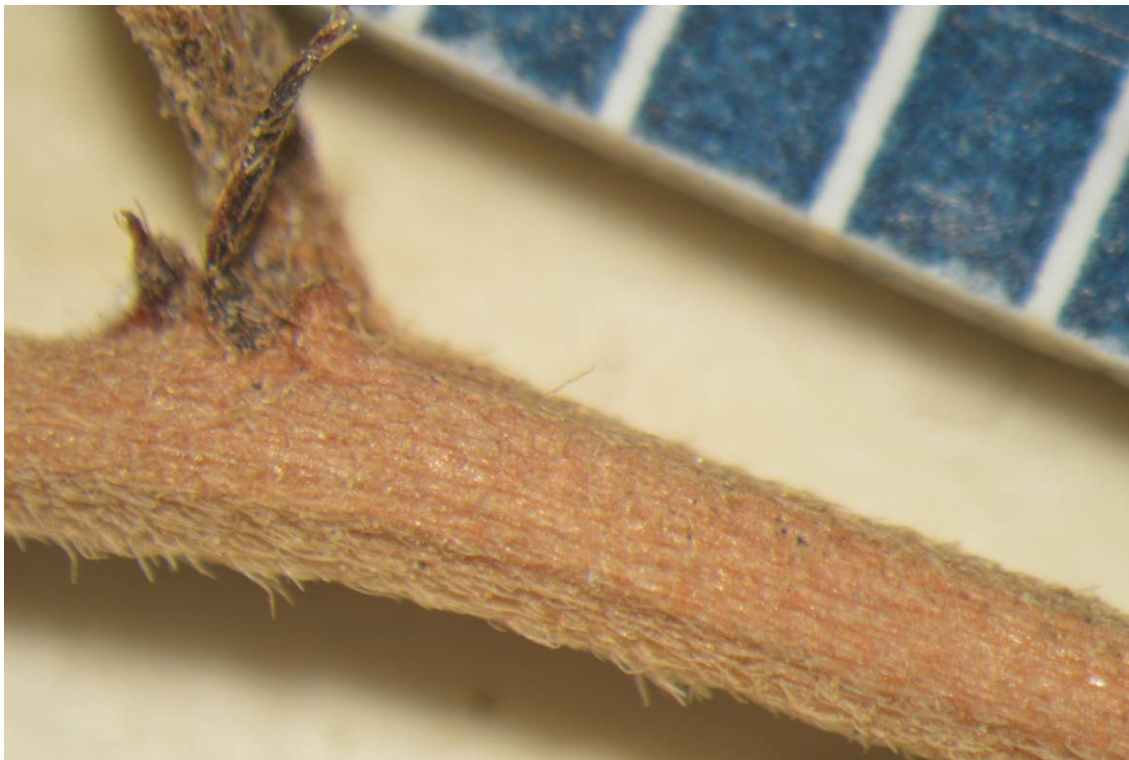


Figure 17. *Galactia michauxii*, with a retrorsely strigose stem and petiole in the upper left (*Seymour 91720* [19126]). The distal portion of the stem is towards the left.



Figure 18. *Galactia michauxii*, seeds (Franck 1478).



Figure 19. *Galactia microphylla* (Carlton s.n. [162778]).

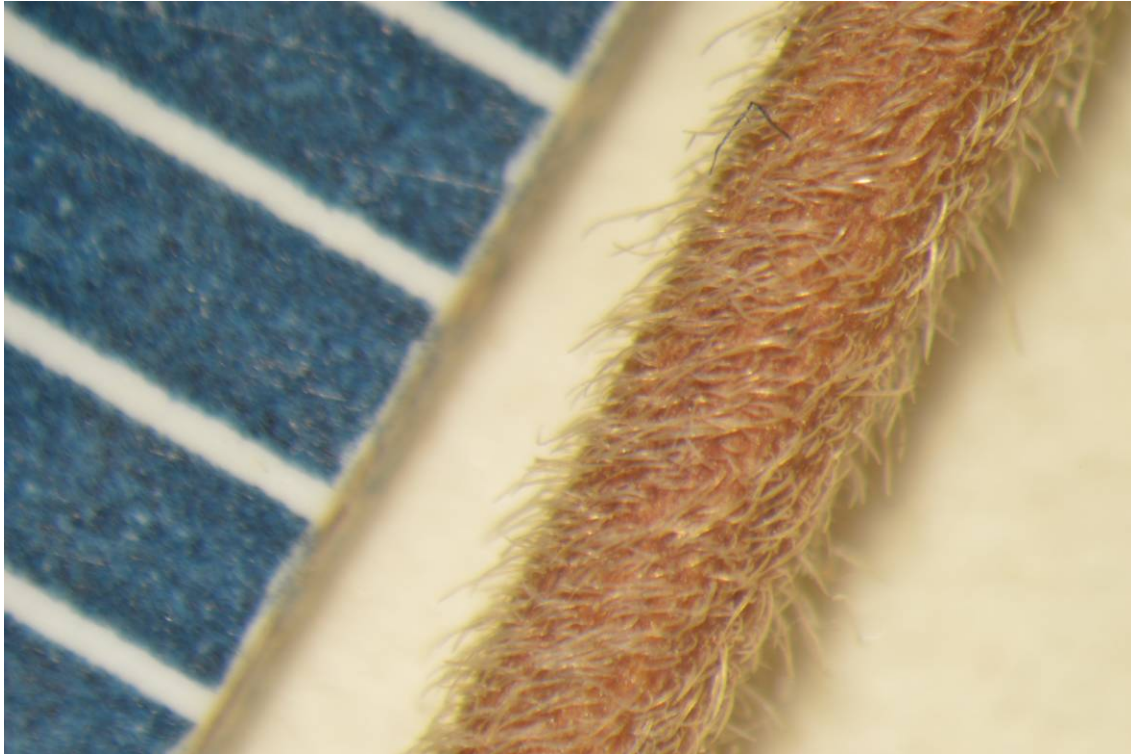


Figure 20. *Galactia microphylla*, with a retrorsely villous stem (Carlton s.n. [acc. no. 162778]). The distal portion of the stem is towards the upper right.



Figure 21. *Galactia minor* (Kral & Godfrey 6064).



Figure 22. *Galactia minor*, with an antrorsely strigose stem (Kral & Godfrey 6064). The distal portion of the stem is towards the top.

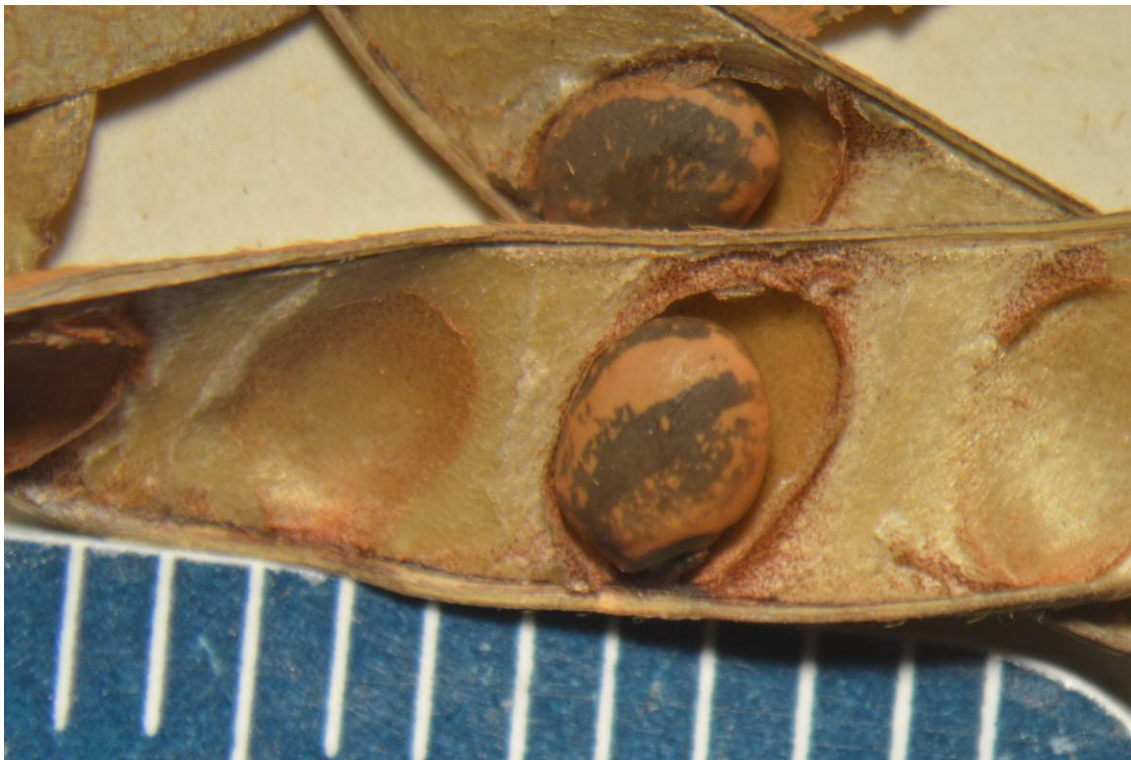


Figure 23. *Galactia minor*, seeds attached to the fruit. (Kral & Godfrey 6064).



Figure 24. *Galactia mollis* (Ahles & Haesloop 29747).

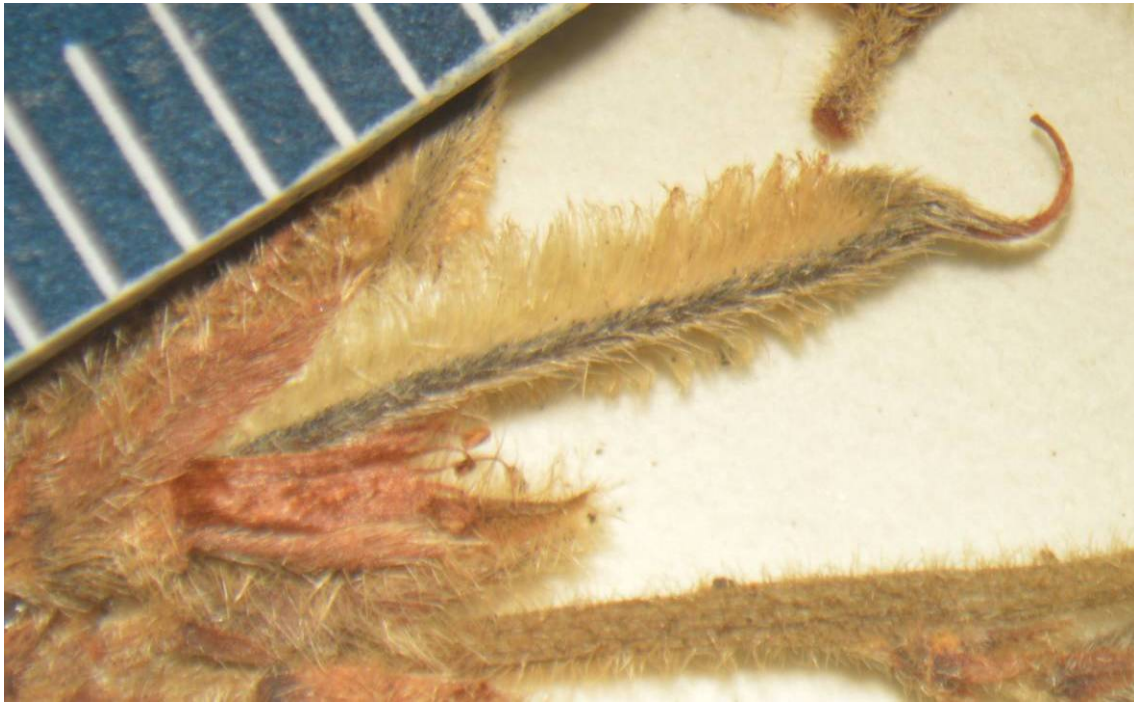


Figure 25. *Galactia mollis*, with a spreading villous immature fruit, and persistent reddish stamens and calyx (Daubenmire & Daubenmire s.n. [179710]). The distal portion of the inflorescence is towards the right.



Figure 26. *Galactia pinetorum* (Britton s.n. [192046]).



Figure 27. *Galactia pinetorum*, with a retrorsely pilose stem and an inflorescence rachis on the right (Bradley 1670). The distal portion of the stem is towards the the upper right.

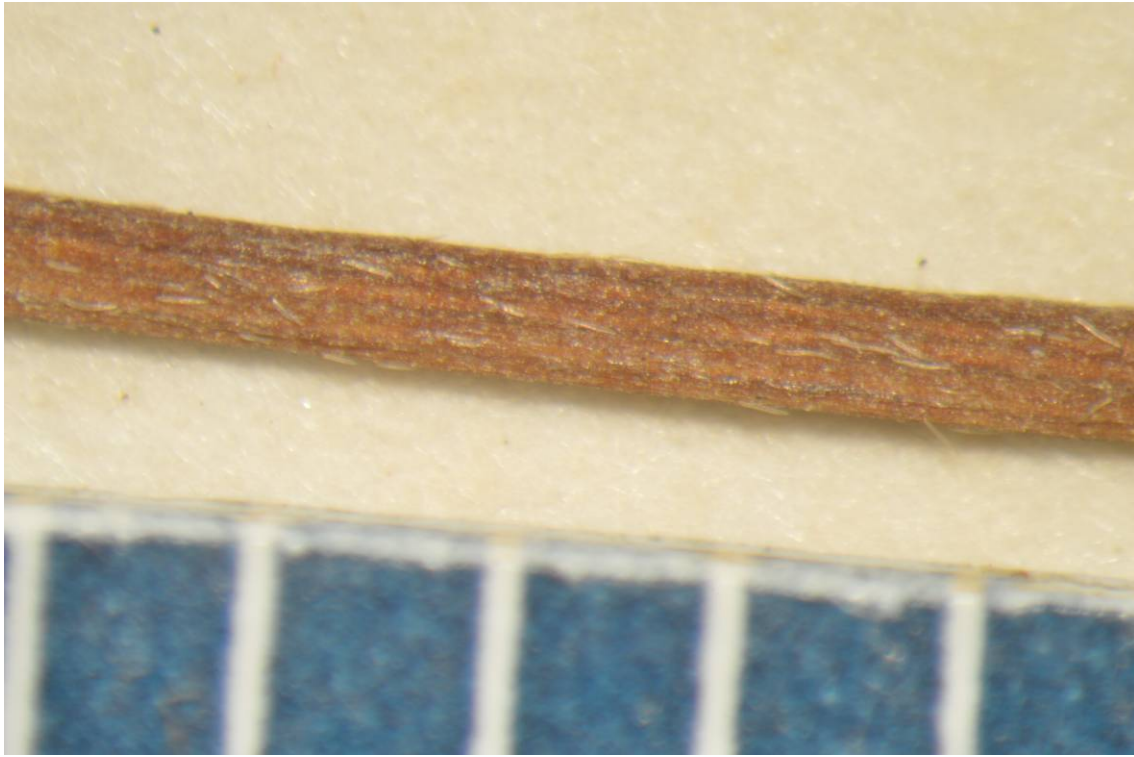


Figure 28. *Galactia pinetorum*, with a retrorsely sparsely strigose stem (Broome s.n. [75282]). The distal portion of the stem is towards the left.



Figure 29. *Galactia pinetorum*, with pellucid dots throughout the adaxial surface of the leaflet (Lakela 28773).



Figure 30. *Galactia regularis* (Wharton 5705).



Figure 31. *Galactia regularis*, with villous stems (middle, right) and a petiole (left) (Duncan 17183). The distal portion of the middle stem is towards the bottom and of the right stem towards the top.

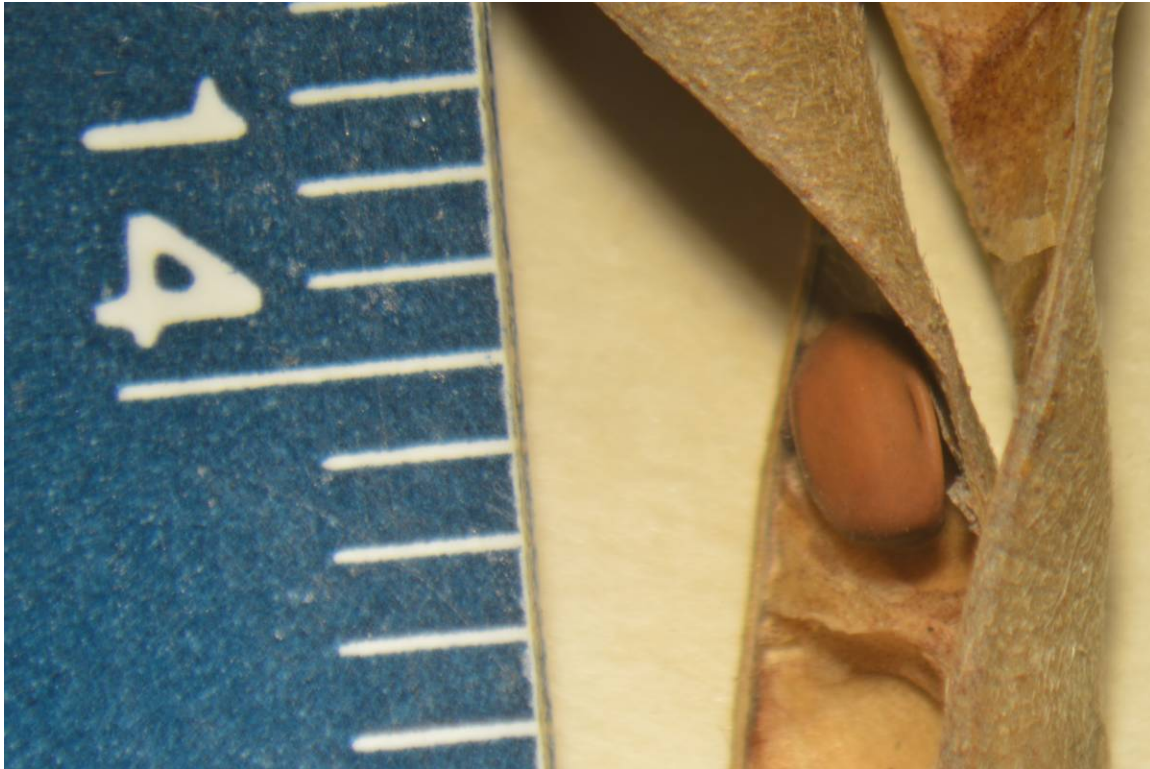


Figure 32. *Galactia reglularis*, likely an immature seed attached to the fruit (Seymour 49 [19358]).



Figure 33. *Galactia smallii* (Woodmansee & Hoffman 30).

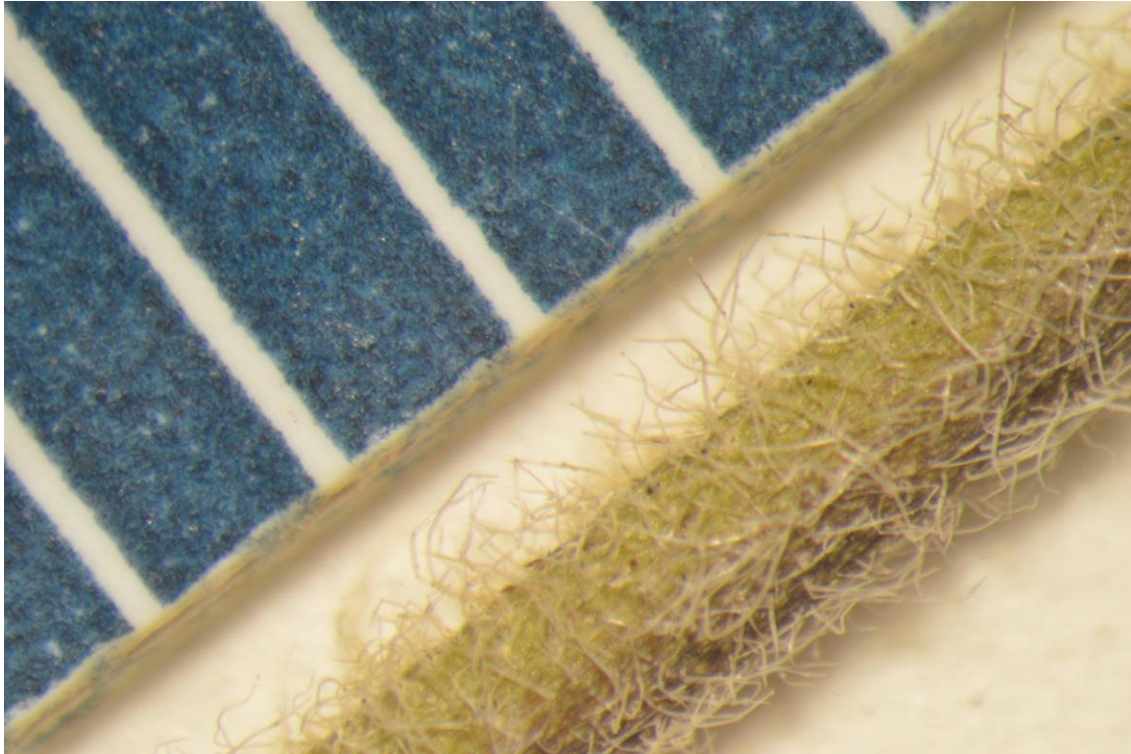


Figure 34. *Galactia smallii*, with a villous stem (Franck 3923). The distal portion of the stem is towards the right.

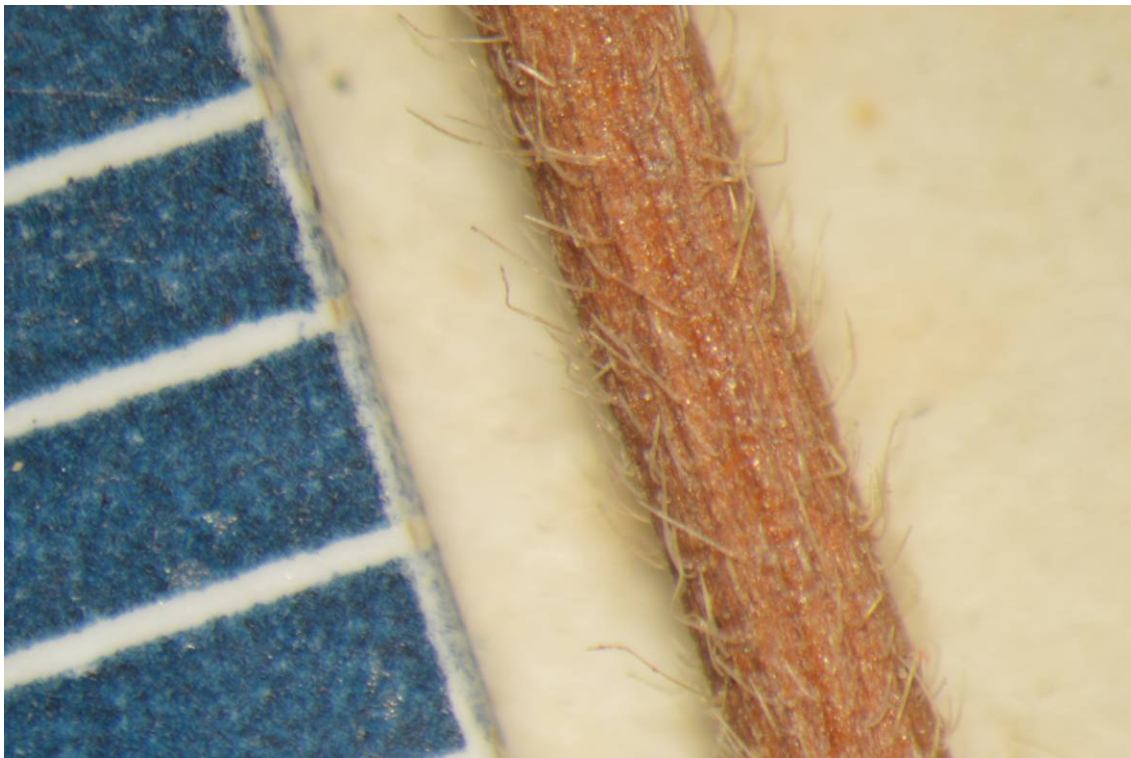


Figure 35. *Galactia smallii*, with an antrorsely pilose stem (Lakela 28766). The distal portion of the stem is towards the top.



Figure 36. *Galactia smallii*, seed, possibly immature (Franck 3923).



Figure 37. *Galactia striata* (Longbottom & Williams 5465).

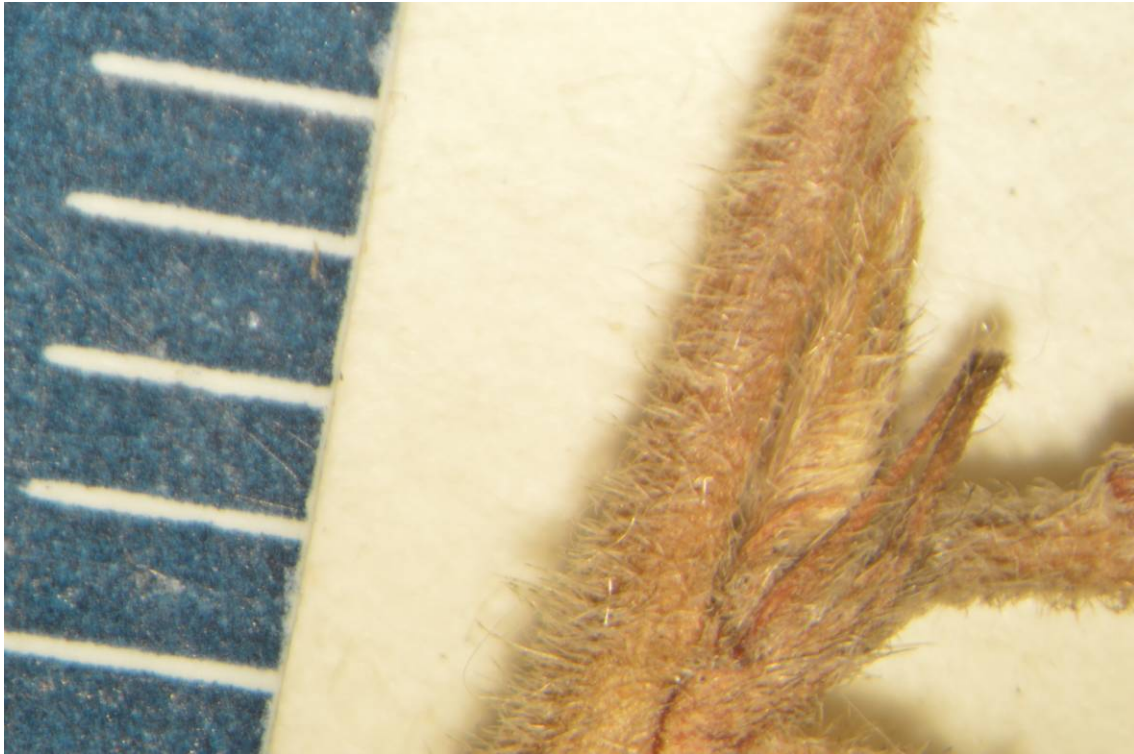


Figure 38. *Galactia striata*, with a villous stem (Todd 91). The distal portion of the stem is towards the top.



Figure 39. *Galactia volubilis* (Franck 868).



Figure 40. *Galactia volubilis*, with a retrorsely hirsute stem (Caudle et al. 5744). The distal portion of the stem is towards the right.

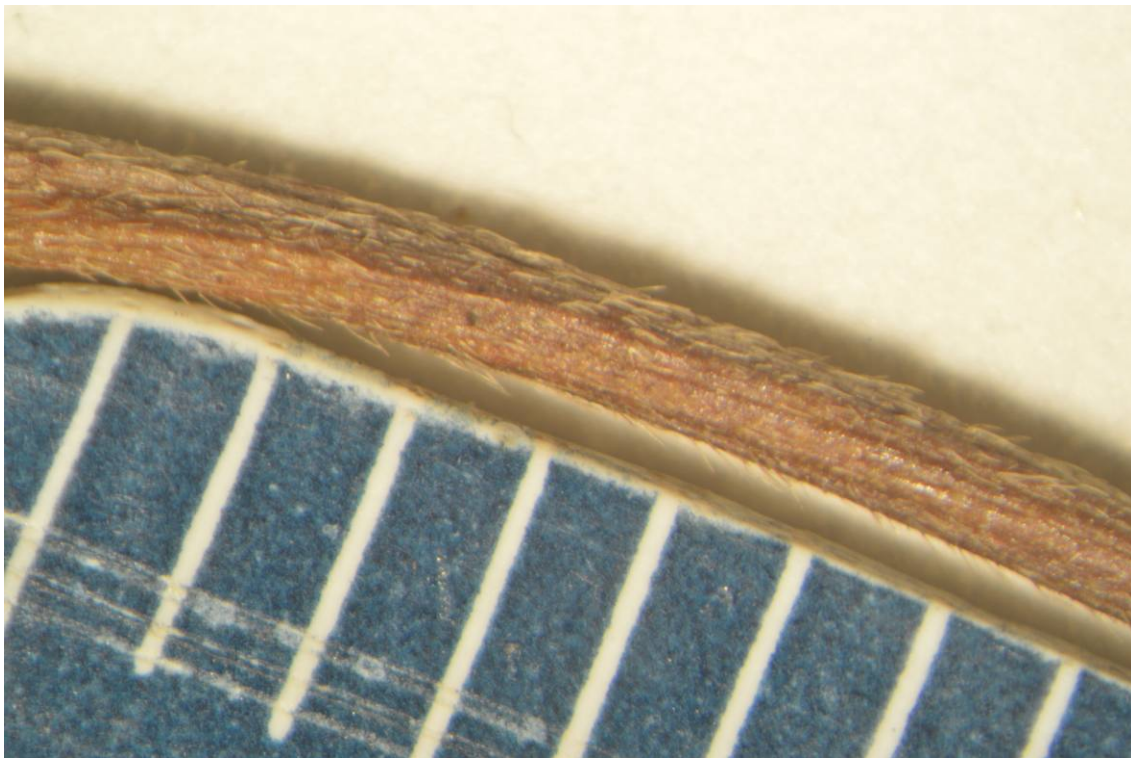


Figure 41. *Galactia volubilis*, with a retrorsely strigose stem (Gandy MWSR0074). The distal portion of the stem is towards the upper left.



Figure 42. *Galactia volubilis*, seeds (Hansen et al. 10840).