

KEYS TO THE FLORA OF FLORIDA -- 10, *GALACTIA* (LEGUMINOSAE)

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ABSTRACT

Galactia (Leguminosae) is represented in Florida by 11 species, one of which consists of three varieties. The application of *G. regularis* and *G. volubilis* is reversed from that of other studies. *Galactia volubilis* **var. baltzelliana** is described as new, and *G. volubilis* **var. fasciculata** is recognized as a new combination. *Galactia microphylla* is corrected to *G. minor*. *Dioclea multiflora* is rejected as a transfer into *Galactia*. An amplified key is given to the Florida taxa.

KEY WORDS: *Galactia*, Leguminosae, Florida flora.

The genus *Galactia* (Leguminosae) is a familiar yet difficult component of the southeastern flora. Though the taxa of which it is constituted are few, and though some are sharply distinct, others show variations so subtle and intergrading that no two investigators are in agreement as to the number of species or the characteristics by which they may be separated. Further reducing understanding are several recent nomenclatural reinterpretations which impose unfamiliar names or even reverse the application of two well-known names from their accustomed usage.

The first comprehensive synopsis of North American *Galactia* was that of Anna M. Vail (Bull. Torrey Bot. Club 22:500-511. 1895), a study of surprising quality considering the little field information then available. With access to vastly greater herbarium materials and opportunity for field experience, H. J. Rogers (Ph.D. diss., Duke Univ. 1949), under

the direction of H. L. Blomquist, prepared a fully detailed systematic treatment of *Galactia* of the United States; this thesis, regrettably never published, has been underutilized by later authors.

Perhaps put off by Vail's sometimes trichotomous or even quadrichotomous key and lacking ready access to Rogers's thesis, recent authors have formulated independent treatments to Florida species: A. Herndon, *Rhodora* 83:471-472. 1981; A. F. Clewell, *Guide to the Vasc. Plants of the Florida Panhandle*. 1985; R. P. Wunderlin, *Guide to the Vasc. Plants of Florida*. 1998. Though their summaries are valuable, these authors were either limited in their geographic coverage or placed in synonymy certain taxa recognized by previous authors that now seem worthy of recognition.

For decades the acknowledged leader in taxonomic investigation of the American legumes has been Duane Isely of Iowa State University. Dr. Isely, who over a period of years spent many weeks working alongside or in association with the present authors, incorporated many of their observations of *Galactia* into his treatment of the southeastern species (*Vasc. Flora of the Southeastern U. S.* 3(2):147-152. 1990). Yet the breadth of Isely's task (to address all species of Leguminosae throughout the Southeast), together with several significant reinterpretations of current nomenclature, and the value of formalizing a varietal taxon discussed by Isely but not named or fully described -- as well as the differences in interpretation held by authors more recent than Isely -- has stimulated the present authors to submit a further treatment of Florida *Galactia*.

A major nomenclatural complication has been the analysis by W. H. Duncan (*Sida* 8:170-180. 1979) that the Linnaean epithets applied to two widespread species of *Galactia* have long been misinterpreted and, moreover, have been used one for the other; that is, the names are valid, but their correct application is the reverse of earlier usage. By Duncan's assessment, *G. regularis* (L.) BSP. is the small-flowered (7-9 mm. long), vigorously twining plant previously called *G. volubilis*, while true *G. volubilis* (L.) Britt. is the large-flowered (10-14 mm. long), scarcely-twining taxon known elsewhere as *G. macreei* or *G. regularis* (Small

in part, 1933; Fernald, 1950; Gleason, 1952; Gleason and Cronquist, 1963; Wilbur, 1963; Wilbur in Radford et al., 1964; Clewell, 1985; Isely, 1990; Wunderlin, 1998). In each case, by reference to the actual specimens underlying the pre-Linnaean publications referred to by Linnaeus, Duncan argued these specimens and other materials available to Linnaeus supported this new assessment. Duncan stands nearly alone in this interpretation; it is disappointing that subsequent authors have neither followed Duncan nor chosen to examine or attempt refutation of the factual basis for his nomenclatural judgments.

The present authors felt obligated to independently assess the basis for these names. The argument, as reported by Duncan, was perhaps too briefly stated. The basionym of *Galactia regularis* is *Dolichos regularis* L. (1753:726). Linnaeus had no specimen directly supporting this name, but gave it the diagnosis: *DOLICHOS foliis ovatis obtusis, pedunculis multifloris, petalis aequalis magnitudinis figuraeque*, and referred to Gronovius (1739:82). Linnaeus had taken that language from the phrase-name of Gronovius (who further noted it to be racemosis). Gronovius also had cited Clayt. n. 121. John Clayton's specimen (photo, BM) bears the text, "A trifoliated slender twining plant with small reddish flowers, growing in spikes from the wings [stipules?] of the leaves. Dr. Clayton ex Virginia num. 121." Clayton's specimen corresponds to the plant here (and by Duncan) called *G. regularis*; the "small" flowers are definitive. It thus seems inescapable that *Galactia regularis* (L.) BSP. is based on the small-flowered plant.

[Aside from the specimens themselves, the text accompanying a second Clayton specimen, his 213 (photo, BM), confirms that Clayton recognized both a small-flowered and a large-flowered species. On this second sheet Clayton had written, "A slender twining trifoliated plant with a large purple papilionaceous flower, and a thin compressed pod. This grows in shady woods, an[d] flowers in July. Dr. Clayton ex Virg. n. 213." This second specimen corresponds to the plant here (and by Duncan) called *G. volubilis*.]

The basionym of *Galactia volubilis* is *Hedysarum volubile* L. (1753:750). Again, Linnaeus had no specimen directly supporting this name, but cited three references: Dillenius (1732), Linnaeus's own Hortus Cliffortianus (1737), and Royen (1740). Only one of these authors appears to have relied directly upon a specimen. Royen merely referred to Hortus Cliffortianus, while Hortus Cliffortianus relegated the plant to its Appendix, an indication that there was no underlying specimen, then cited Dillenius. Fortunately the Dillenius specimen is extant (photo, OXF); Duncan found it to be the large-flowered plant. Thus Linnaeus, by inclusion of the Dillenius reference and, indirectly, Dillenius's specimen in his circumscription, caused *Galactia volubilis* (L.) Britt. to be based on the large-flowered plant.

The exceptionally larger leaflets and flowers of plants of *Galactia volubilis* from populations in west-central peninsular Florida, brought to the attention of the present authors by Leland and Lucy Baltzell, Lakeland, has suggested the need for formal recognition.

***Galactia volubilis* (L.) Britt. var. *baltzelliana* D. B. Ward & D. W. Hall, var. nov.**

Similis G. volubilis s.s. (sensu Duncan, 1979), sed floribus grandioribus (a 21 mm. longis), foliis subcoriaceis, et caulibus quibus fortiter scandentibus.

TYPE: United States. Florida, Lake Co.: 1505 Moss Ave., 1 mi. n. of Leesburg, 25 Sep 1975, *D. W. Hall 413*, with *L. M. Baltzell* (HOLOTYPE, FLAS 151164; ISOTYPES, FLAS 151162, 151163).

PARATYPES: Lake Co.: Forest Service road 71, Ocala National Forest, 1.4 mi. e. of Fla. 19, S39, T15S, R27E, 2 Aug 1962, *D. B. Ward 3036*, with *A. A. Will* (FLAS); Leesburg, 19 Sep 1967, *L. M. Baltzell 153* (FLAS); 0.5 mi. n. of Leesburg, *L. M. Baltzell 5327*, 8 Aug 1973 (FLAS); Youth Camp, 3 mi. n. of Leesburg, 31 Aug 1980, *L. M. Baltzell 11190* (FLAS). Levy Co.: 3 km. n.e. of Cedar Key, 28 Aug 1982, *K. A. Kron 1029* (FLAS).

The several collections here placed in *Galactia volubilis* var. *baltzelliana* were examined by Isely, who agreed (1990:151) they represent a “spectrum of characters” that may deserve formal nomenclatural status. In the field they seem even more distinct than the diagnostic characters indicate, for the stems of var. *baltzelliana* climb robustly through overlying vegetation, while var. *volubilis* remains either prostrate or laxly climbing.

An 1895 collection from Tampa, western coastal Florida, named *Galactia fasciculata*, has been difficult to assign. Though accepted as a species by Vail (1895), its original author, and by Rogers (1949), it has been dismissed by later workers as a synonym of *G. regularis* (here treated as *G. volubilis*). Yet its fascicled inflorescences and orbicular, deeply emarginate leaves (illustrated by Rogers) do not well correspond to that taxon. It is rare, if not wholly obliterated by the growth of urban Tampa. Rogers cites only a single additional collection (Volusia Co.: Enterprise, 24 Aug 1903, *Britton and Wilson s.n.* (NY)), and no equivalent plants have been encountered in the present study. That this distinctive entity not be lost, it is here given appropriate varietal rank.

Galactia volubilis (L.) Britt. var. *fasciculata* (Vail) D. B. Ward & D.

W. Hall, **comb. et stat. nov.** Basionym: *Galactia fasciculata* A. M. Vail, Bull. Torrey Bot. Club 22:505. 1895.

Galactia brachypoda Torr. & Gray (1838) is a puzzling entity, based upon two A. W. Chapman specimens (NY) from “Middle Florida” (i.e., central panhandle Florida), thought by Isely (*Brittonia* 38:352-359. 1986) to represent either a “rare hybrid” or a “freak form” of *Galactia erecta*. Rogers (1949) cited an additional Chapman specimen (MO) from Wewahitchka, Gulf Co., possibly also the source of the “Middle Florida” specimens. Since this location is a center of endemism on the Gulf coast, these collections may represent an endemic species, long-uncollected or perhaps extinct. [A specimen cited by Rogers from Dade Co. (Hood in 1912 - FLAS) is apparently atypical *G. volubilis*.] This entity has been held as distinct by most early authors; Rogers provided a suite of characters by which the two may be separated. But for the

present, *G. brachypoda* is placed in synonymy of the clearly related, if not conspecific, *G. erecta*, awaiting further collections and understanding.

The transferring authors of the combination *Galactia microphylla* have been given by Isely (Brittonia 38:352-359. 1986; Vasc. Fl. Southeastern U. S. 3(2):150. 1990) as "Rogers ex Hall & Ward." Though in 1974 D. W. Hall and D. B. Ward had indeed prepared a manuscript, progenitor of the present document, transferring A. W. Chapman's variety *microphylla* to specific rank, and had acknowledged H. J. Rogers who had proposed the same transfer in his unpublished 1949 thesis, the Hall-Ward paper was only in draft form when Isely in 1986 called attention to the desirability of specific rank for the taxon. The author credited with this transfer should thus be Isely. The transfer was unnecessary, however, since the taxon is apparently synonymous with *G. minor* W. H. Duncan (Phytologia 37:59-61. 1977), which has priority at specific rank.

The name *Galactia parvifolia* A. Rich. in Sagra has long been used for a plant of south peninsular Florida, but application of the name and the plant's relations to other Florida species was unclear. Access to an isotype (photo, P) confirmed that the name, as applied to Florida plants, is correct.

A recent proposal that *Dioclea multiflora* (Torr. & Gray) Mohr be incorporated into *Galactia* (R. H. Maxwell, Castanea 44:241-246. 1979) is not accepted. Though a case was made that this species is incongruous in its classic assignment to *Dioclea* HBK., no argument was presented that it would not be even more aberrant within *Galactia* as historically delimited.

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Galactia P. Br. Milk Peas¹

1. Leaves pinnately compound, leaflets 5-9; flowers ivory-white; vining perennial herb. Moist to dry thickets, open woodlands, roadsides. Peninsula, throughout (excl. Dade, Monroe Cos.); common. Spring-summer-fall.

ELLIOTT'S MILK PEA.

***Galactia elliotii* Nutt.**

1. Leaves trifoliate; flowers pink to red or purple.

2. Stems erect or decumbent, bending alternately (zigzag) at the nodes; flowers pale purple to white; perennial herb. Moist to dry open sandy pinelands. Panhandle (east to Leon, Suwannee Cos.); infrequent. Spring-summer. [*?G. brachypoda* Torr. & Gray]

***Galactia erecta* (Walt.) Vail**

2. Stems prostrate or climbing and twining, not bending alternately at the nodes.

3. Stems prostrate, trailing, or scrambling on low vegetation (or, if vigorously climbing, flowers >13 mm. long).

4. Petioles usually less than 1.5 cm. long; flowers mostly 1-3 per panicle; trailing perennial herb. Dry sandy pinelands. West and central panhandle (east to Liberty, Gadsden Cos.); infrequent. Summer. [*G. floridana* Torr. & Gray var. *microphylla* Chapm.; *G. microphylla* (Chapm.) Rogers ex Isely]

***Galactia minor* Duncan**

4. Petioles usually greater than 2 cm. long; flowers 5 or more per panicle.

1. The "amplified key" format employed here is designed to present in compact form the basic morphological framework of a conventional dichotomous key, as well as data on habitat, range, and frequency. This paper is a continuation of a series begun in the 1970s (vide *Phytologia* 35:404-413. 1977).

5. Leaflets narrowly oblong (or a few oval); calyx 8-9 mm. long; trailing perennial herb. Rocky pinelands. Endemic to south peninsula (Dade Co.: Everglade Keys); rare. All year.

***Galactia pinetorum* Small**

5. Leaflets ovate, occasionally narrowly so; calyx usually less than 8 mm. long (if longer, then leaflets broadly ovate).
6. Stems and leaves puberulent to glabrate; trailing perennial herb. Pinelands, hammock margins. Endemic to south peninsula (Dade Co.: Everglade Keys); rare. Spring. [*G. prostrata* Small] ENDANGERED (Federal, State listings).

***Galactia smallii* Rogers ex A. Herndon**

6. Stems and leaves with prominent, spreading pubescence.
7. Calyx 6-8 mm. long; flowers (keel) 11-14 mm. long; trailing perennial herb. Low pinelands. Endemic; panhandle, south to mid-peninsula (Hillsborough, Polk Cos.); infrequent. Summer. [*G. regularis*, misapplied]

***Galactia floridana* Torr. & Gray**

7. Calyx 9-12 mm. long; flowers (keel) 11-21 mm. long; trailing or climbing perennial herb. Dry sandy woodlands, thickets. Summer-fall.

***Galactia volubilis* (L.) Britt.**

- 7a. Leaflets near-orbicular, deeply emarginate; inflorescences fascicled. Hillsborough Co.: Tampa; rare, perhaps no longer extant. [*G. fasciculata* Vail]
var. ***fasciculata*** (Vail) D. B. Ward & D. W. Hall

- 7a. Leaflets broadly ovate, obtuse or rounded; inflorescences usually single.

7b. Flowers (keel) 11-15 mm. long; leaves thin or slightly coriaceous; stems prostrate or laxly climbing. Throughout; common. [*G. glabella* Michx.; *G. macreei* M. A. Curtis; *G. regularis*, misapplied] var. **volubilis**

7b. Flowers (keel) 13-21 mm. long; leaves somewhat coriaceous; stems vigorously climbing (but usually without twining). West-central peninsula (Lake, Levy Cos.); rare.

var. **baltzelliana** D. B. Ward & D. W. Hall

3. Stems climbing, twining; flowers (keel) 7-14 mm. long.

8. Mature fruits 5.5-9 mm. broad, clearly falcate; stems woody, high climbing; flowers red-violet; twining perennial herb. Brushy coastal thickets, pinelands. South peninsula (north along west coast, to Lee County); locally frequent. All year. [*G. spiciformis* Torr. & Gray]

Galactia striata (Jacq.) Urban

8. Mature fruits less than 6 mm. broad, straight or slightly falcate; stems not woody, not very high climbing.

9. Leaflets with long soft sometimes matted hairs on both surfaces; calyx long-pubescent; petals dark red to rose-purple, drying dusky rose; ovary and pod densely pubescent with long soft hairs; twining perennial herb. Dry sands of high pinelands. North Florida, from mid-panhandle (Franklin Co.), to east coast (Duval Co.); infrequent. Spring-summer.

Galactia mollis Michx.

9. Leaflets with stiff appressed or spreading short hairs, or glabrous above; calyx appressed to spreading short-pubescent; petals pink to purple, drying white to variously purple (but not dusky rose); ovary and pod with stiff appressed to spreading short hairs.

10. Leaflets elliptic to narrowly ovate; pubescence spreading; twining perennial herb. Moist to dry thickets, open hammocks, roadsides. Throughout; common. Spring-summer-fall. [*G. mississippiensis* (Vail) Rydb.; *G. volubilis*, misapplied]

***Galactia regularis* (L.) BSP.**

10. Leaflets linear to narrowly elliptic; pubescence appressed; twining perennial herb. Pinelands. South peninsula (Dade Co.: Everglade Keys; Monroe Co.: Florida Keys); infrequent. Fall-winter-spring.

***Galactia parvifolia* A. Rich. in Sagra**



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