CONTRIBUTIONS FROM THE GRAY HERBARIUM
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OVERLOOKED SPECIES, TRANSFERS AND
NOVELTIES IN THE FLORA OF
EASTERN NORTH AMERICA

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During a restudy of the Liliaceae of the Gray's Manual area I was soon confronted by the many species proposed by Rafinesque in one of his relatively careful and trustworthy works, Autikon Botanikon (1840), a book so rare, until the offset of it issued by the Arnold Arboretum, that only casual names from it (and those picked up through other sources) were caught by the editors of Index Kewensis. Dr. Merrill is engaged on a bibliographic study of great extent, dealing with this and other neglected works of Rafinesque. It is, consequently, not appropriate here to go into further detail than to note a few species in Autikon Botanikon which have immediately to be taken into account in my studies. Very soon I found Rafinesque referring to species of Bartram, and on checking Bartram's Travels (1791) the same situation was found: only casual names of species by Bartram were entered in Index Kewensis, these picked up from the writings of others who had cited them. Accordingly, it was necessary to study Bartram's Travels, with such limited knowledge of the flora of the southeastern United States as I have. The present Contribution, therefore, is made up partly of consideration of some of the species of Bartram, some in Rafinesque's
Autikon Botanikon, some based on study of photographs of types of Linnaeus in the Liliaceae, and the usual miscellany which has accumulated in recent months. The items are arranged in systematic sequence.

Panicum (sub-§ Lanuginosa) Benneri, sp. nov. (tab. 807), planta cespitosa 1.7-3.5 dm. alta; culmis firmis erectis basi 1-1.5 mm. diametro, internodiis ad 7.5 cm. longis pilosis pilis adscendentibus; nodis barbatis; foliis lanceolatis firmis valde adscendentibus glabris vel subtus sparsissime breviterque pilosis 3.5-6.5 cm. longis 5-8 mm. latis 36-42-nervis basi villosociliatis, vaginis subhorizontaliter hirsutis pilis 1-1.5 mm. longis basi bullatis, ligulis 2-3 mm. longis; paniculis primariis breviter estertis ellipsoideo-ovoideis 2.5-6 cm. longis 1.5-4 cm. diametro, rhachi imo hirtello sparsissime villoso, ramis patento-adscendentibus ramulis subsimplicibus, pedicellis 2-6 mm. longis glabris; spiculis pubescentibus ellipsoideis basi apiceque obtusis 2.2-2.6 mm. longis 1.2-1.4 mm. latis, gluma inferiore perbrevi deltoideo-rotundata subapiculata 0.5-0.8 mm. longa, superiore lemmateque sterile aequilongis valde costatis fructus lucidos subaequantibus.—New Jersey: old field along Delaware River, about 1½ miles east of Raven Rock, Hunterdon County, June 7, 1941, Walter M. Benner, no. 9635, Type in Herb. Gray.; Isotype in Herb. Phil. Acad.

By the treatments of Hitchcock and Chase, of Hitchcock’s Manual and my own manuscript-treatment Panicum Benneri, traced through the keys, comes directly to P. villosissimum Ell. Its very stiff habit, glabrous or essentially glabrous, short firm leaves, the very short and broad first glume of the spikelet, short-peduncled panicle, only slight (instead of usually pronounced) development of branches at the time of primary anthesis, and the relatively short and strongly pustular-based pubescence of the sheaths at once distinguish it. In P. villosissimun the culms are 2-7 dm. high and the leaf-blades of the vernal culms 6-11 cm. long, and 5-10 mm. wide, more or less pubescent on both faces; in P. Benneri the stiffly erect culms are 1.7-3.5 dm. high, the leaf-blades more lanceolate, 3.5-6.5 cm. long and 5-8 mm. wide, the upper surface hard and glabrous, the lower barely and minutely pilose, while the strongly pustular-based hairs of the sheaths of P. Benneri are shorter than the most often slender and more villous sheath-hairs of P. villosissimum. As above noted, P. villosissimum, while the vernal or primary panicles are intact, usually has well developed axillary
branches; in *P. Benneri* only a few, and those very short, such branches are developed. In *P. villosissimum* the fully developed primary panicles are 4–10 cm. long and on peduncles 0.3–1.7 dm. long; in *P. Benneri* the primary panicles are 2.5–6 cm. long and on peduncles only 0.5–4 cm. long. The first glume of *P. villosissimum* is ovate, one fourth to two fifths as long as the spikelet; in *P. Benneri* broadly deltoid-rotund and one fifth to barely one fourth the length of the spikelet.

In its very short and broad first glume the spikelet of *Panicum Benneri* suggests some variations of the heteromorphic *P. lanuginosum*, such as var. *fasciculatum* (Torr.) Fern. (*P. tennesseense* Ashe) or var. *septentrionale* Fern.; but its spikelets are altogether too large and the panicle too simply branched. In *P. lanuginosum* and its varieties the secondary branches of the panicle are themselves branched (whence *P. implicatum* Scribn.).

The once-forked branching of the panicle of *P. Benneri* is similar to that of *P. meridionale* (with spikelets 1.3–1.6, instead of 2.2–2.6 mm. long). It also suggests the panicle of the relatively northern *P. subvillosum* Ashe, but that characteristic species has the leaf-sheaths mostly equaling or exceeding, instead of shorter than the internodes, and appressed-pilose, instead of divergently hirsute with pustular-based hairs. Furthermore the axis of the panicle of *P. subvillosum* is appressed-pilose to glabrate, in *P. Benneri* divergently hirtellous, with some horizontally spreading villi; the spikelets of *P. subvillosum* are 1.8–2 mm. long, 0.9 mm. broad, and the prolonged first glume is one third to half the length of the spikelet.

*Panicum Benneri*, with which it is a privilege to associate the name of the keen and always helpful student of his local flora, Walter Mackinnett Benner, its discoverer, seems to be a real species. Whether it is relatively northern, as its type-region suggests, we do not know. It is more likely so, and to be sought in northeastern Pennsylvania and southern New York, than an extension from farther south in New Jersey and Pennsylvania where the small army of keen explorers would long ago have found it. Mr. Benner has most generously defrayed the expense of Plate 807.

In Plate 807, figs. 1 and 2 are portions of the type of *Panicum Benneri*, × 1; fig. 3, internode and cauline sheath, × 3; fig. 4, axis of panicle, × 10; fig. 5, spikelet, × 10.
This distinctive white-flowered species of northwestern Florida and Alabama is related to *X. flexuosa* Muhl. and *X. fimbriata* Ell. in having exserted and fimbriate sepal-tips. It was well characterized by Rafinesque, who recognized its affinity with the latter species:


—Florida, disc. by Baldw. in 1815, not yet described, unless *X. fimbriata* of Elliot be very badly so, and appears rather an akin sp. leaves pedal, scape bipedal. fl. white by a note of Baldwin, while all others are yellow.

*X. fistulosa* Raf. 1. c. (1840), based upon *X. juncea* Baldw., not R. Br., is *X. Baldwiniana* Schultes, Mant. (1822). His *X. retusa*, 1. c. 190 and *X. spiralis*, 1. c., are apparently *X. torta* J. E. Sm.


*Luzula saltuensis* of woodland and thicket from Newfoundland to Saskatchewan, south into the Northern States and locally southward, was separated from the cespitose Eurasian *L. pilosa* (L.) Willd. because of its looser habit, with elongate more or less repent basal offsets, its paler and acuminate sepals and its more pointed capsules. Later (in 1938) I reduced it to varietal rank under the poorly typified *L. carolinae* S. Wats. in Proc. Am. Acad. xiv. 302 (1879), the latter southeastern plant being larger and with more forking branches to the corymb. It now seems that Rafinesque was nearly 40 years ahead of Watson and more than 60 ahead of me. There can be no doubt that his *L. acuminata* was *L. saltuensis*. His definition of it was good:

1447, *Luz. acuminata* Raf. repens, glabra, fol. lanceol. acum. striatis nervosis spiculis corymbosis congestis paucifloris fuscatis, calic. acum.—Boreal America, perhaps *J. pilosus* Mg. often blended with last, leaves broader and shorter, 3 uncial, stem semipedal, corymb. not exceeding the leaves, fl. small.
The taking up of *Luzula acuminata* (1840) necessitates the following combination


*Luzula labradorica* Raf. l. c. (1840) was unquestionably *L. parviflora* (Ehrh.) Desv. (1808) or its var. *melanocarpa* (Michx.) Buchenau, which latter rests on *Juncus melanocarpus* Michx. (1803). Rafinesque’s name antedates *L. labradorica* Steud. Syn. Pl. Gram. ii. 291 (1855), which is perhaps identical with it.

Rafinesque proposed nine North American species of the prophyllate *Juncli*. Nothing sufficiently distinctive was given in his descriptions for us to be certain what he had. His *J. floridanus*, l. c. 194, was from “South Florida” and Engelmann in Trans. St. Louis Acad. Sci. ii. 451 (1866) cited as *J. Gerardi* Loisel. (1810) material from “North Carolina, Curtis, and Florida, Ware (J. Floridanus, Raf. in Hb. Durand)”. This would seem to dispose of *J. floridanus*. It also gives the clue, that others of Rafinesque’s *Juncli* may have been in Durand’s herbarium, now in Paris. Rafinesque’s *J. fuscatus*, l. c. 194, from “Kentucky, Tennessee, &c”, with “fl. quite peculiar”, was earlier than *J. fuscatus* Turcz. ex Ledeb. (1853), the latter reduced by Buchenau to *J. triglumis* L. *J. fuscatus* Raf. is not clearly identified. So with his other names; they may rest undisturbed.

The Identity of *Yucca filamentosa* (Plates 808 and 809). — *Yucca*, always a baffling genus to work with from herbarium material, has one species, *Y. filamentosa* L., which is reputed to follow much of the Coastal Plain from Louisiana to Florida and northward to North Carolina, with a related plant, *Y. concava* Haw. or *Y. filamentosa*, subforma *latifolia* Engelm., on coastwise sands from Georgia to New Jersey. The tendency has been to follow the conclusions of Engelmann in Trans. St. Louis Acad. Sci. iii. 17–54 (1873). In that study, treating *Y. filamentosa* as a complex species, some of the varieties native, others only in cultivation, Engelmann defined what he considered true *Y. filamentosa*, his forma *genuina*, with two subforms: “a, angusti-
folia”, a plant with linear-lanceolate leaves gradually attenuate from the middle; and b, subforma latifolia, = Y. concava Haw., with broad and rigid lanceolate or spatulate leaves obtusely mucronate and cucullate at tip. He concluded that the brief diagnosis quoted by Linnaeus from Gronovius, “foliiis lanceolatis acuminiatis together with the Hab. Virginia, points to the narrow-leaved form of what I have described as the genuine plant, as the one he and Gronovius had in view. Of this and other forms numerous specimens and full notes have been obtained from Dr. Mellichamp, of South Carolina, on which the following descriptions are based.” Engelmann then went on to discuss the “narrow-leaved form” and the “broad-leaved variety”, which in his Latin account were both subordinate to his “Forma genuina”. In 1880 Baker, Journ. Linn. Soc. Bot. xviii. 227, 228 (1880), split Y. filamentosa into ten varieties, many of them cultivated only, with the broad natural range, “Regiones littorales Americae borealis a Maryland ad Floridam”, treating Y. concava Haworth as Y. filamentosa, “var. Y. concava” and not citing Y. filamentosa, forma genuina, subf. latifolia Engelm. under it. Subsequently, Trelease, Mo. Bot. Gard. 13th Ann. Rep. 46-49 (1902), accepting Engelmann’s and Baker’s divisions in the main, likewise made typical Y. filamentosa the plant with “Leaves 25–40 cm. wide, gradually acute, rather rigid . . . Capsules rather narrowly cylindric”, this plant shown in a photograph (his pl. 8, fig. 1) with narrowly linear-lanceolate and long, attenuate leaves, while its capsule (his pl. 12, fig. 1) was shown as 4–5 cm. long. This plant, taken by Engelmann, Baker, Trelease and subsequent authors as true Y. filamentosa, was assigned the range: “West-central North Carolina to southeastern South Carolina, Florida from Jacksonville to Tampa, and doubtless in the intervening country”. The plant with shorter, broader, more oblong-oblanceolate to spatulate and, in maturity, harshly scabrous heavy leaves, the Y. filamentosa, forma genuina, subf. latifolia Engelm., was taken up as var. concava (Haworth) Baker and a good portrait of a growing plant given (Trelease, pl. 10), showing the very characteristic and short, lanceolate, broad leaves, this very distinct plant given a range from South Carolina and Georgia to Maryland.

It remained for Small, Man. 303 (1933) to see stronger differ-
ences. Still adhering to the plant with "Leaf-blades of a linear type, somewhat narrowed toward both ends, attenuate to the slender apical spine, flat" as Y. filamentosae, with the range "Fla. to Miss., Tenn. and N. C.", this plant with "petals broadly ovate, 4–5 cm. long: capsule 5–6 cm. long", he correctly recognized another species, as Y. concava, with "Leaf-blades spatulate, abruptly narrowed or rounded and concave at the base of the stout apical spine", the species occurring from "Ga. to Del." and having "sepals and petals usually broader" than in the former and the capsule only 4–5 cm. long, the seeds rounder.

Ever since our first trip together to Virginia, Long and I have become very familiar there with the plant we have regularly called Yucca concava, following the treatment of Small. It occurs back of the outer beaches and among the dunes, and in sandy fields, roadsides and dry pineland back from the coast at least 80 miles (to the easternmost border of Dinwiddie County). Baker's "Regiones littorales" tells only part of the story. Throughout all this region of eastern Virginia, thence northward, the plant is constant in foliage, flowers and fruit, the plant beautifully illustrated in Sims, Bot. Mag. xxiii. pl. 900 (1806) as Y. filamentosa, its habit shown by Trelease, l. c. pl. 10. In this plant (our Plate 808) the flowers are 5–7 cm. long, the petals 2–3 cm. broad and rounded to the short acumination, the filaments spiculate-papillate in irregular lines, the style in anthesis about 1 cm. long, the capsule thick-cylindric to short-ovoid, inclined to be constricted at or near the middle and dumbbell-like, 1.5–4.5 cm. long; the semiorbicular seeds 6–7 mm. long by 3–5.5 mm. broad.

In Yucca filamentosa sensu Engelmann, Baker, Trelease and others, including Small, who seems first to have recognized the best specific characters, the southern plant (our Plate 809) with linear-lanceolate long-tapering leaves, the flowers are only 3–5 cm. long, the petals 1–2 cm. broad and tapering to gradually acuminate tips, the filaments nearly pilose with elongate trichomes (especially at base), the style at flowering time nearly obsolete or up to only 5 mm. long, the more uniformly subterete capsule 4–6 cm. long.

When Engelmann assumed, because he had material from South Carolina of the latter plant, that it must, therefore, be the
Virginian plant, "In littoribus arenosis fluminum crescit", of Clayton, which is the type of *Yucca filamentosa* L., he was at least naïve. Not all plants of South Carolina and Virginia are identical. In exploring the southeastern counties of Virginia Mr. Long and I have often noticed that farmers frequently set young plants of their native *Yucca* along roadways and in sandy clearings. Our driver for some seasons, a farmer of keen intelligence, Leonard Birdsal1, explained that they harvest the hard leaves as "Silkgrass", and after macerating them and softening the tissue, remove the strong threads for use in tying bunched vegetables. This plant, *Y. concava*, being the abundant and, so far as we know, the only native species of the genus in eastern Virginia, it is not surprising that the specimen preserved at the British Museum (photograph sent by Dr. Ramsbottom) should show the characteristic flowers (PLATE 808, FIG. 1)—the two smallish ones at the tips of branches—of typical *Y. concava*, nor that Clayton's no. 720 (miscopied by Gronovius as 270), the type of *Y. filamentosa*, should have been labeled by him: "Yucca flore albo, foliorum marginibus filamentosis. Silkgrass."

The type of *Yucca filamentosa* L. Sp. PI. 319 (1753) being the relatively northern *Y. concava*, it is necessary to find the proper specific name for *Y. filamentosa* sensu Small, the *Y. filamentosa*, *forma genuina*, subf. *angustifolia* of Engelmann. Study of the bibliographies of Engelmann, Baker and Trelease yielding none, I venture to name the narrow- and smoother-leaved southern plant for the botanist who first saw its specific differences. It is a pleasure so to do; it is not always that I can follow him. I am calling it


Although Small states that the smaller-flowered and more southern *Yucca Smalliana* (Y. *filamentosa* sensu Small, not L.) has "panicle-branches glabrous", the material before me shows them merely glabrescent. At flowering time they are pruinose-pilose, only in fruit becoming glabrate. True northern *Y. filamentosa* has the panicle glabrate from the first. In its pubescent
panicle *Y. Smalliana* suggests the upland *Y. flaccida* Haw., of the Blue Ridge and adjacent uplands, which may have pubescent or glabrescent panicle; but, as I understand it, *Y. flaccida* has very pliable and thin leaves, very broad and abruptly short-acuminate petals (as shown in Lindl. Bot. Reg. xx. t. 1895 (1836)), and the native specimens which seem to belong to it have the style elongate and the broad and flat filaments coarsely ciliate. In *Y. Smalliana* (pl. 809) the flower is smaller, with much narrower and acuminate sepals and petals, the style obsolete or very short, and the filaments less flattened and finely pruinose-pilose.

Plate 808 is of *Yucca filamentosa* L.: fig. 1, terminal flowers, × 1, from the type (from photograph sent by Dr. John Ramsbottom); fig. 2, characteristic leaves, × ½, from Old Town Neck, Northampton County, Virginia, Fernald, Long & Fogg, no. 5269; figs. 3 and 4, flowers, × 1, from Cape Henry, Virginia, Fernald, Griscom & Long, no. 4707; fig. 5, ovary, style and filaments, × 3, from no. 4707; fig. 6, ripe capsules, × 1, from south of South Quay, Virginia, Fernald & Long, no. 10,585.

Plate 809, *Yucca Smalliana* Fernald: fig. 1, leaves and flowers, × ½, from type; fig. 2, basal rosette, greatly reduced, from Florida, photo. by A. H. Curtiss, 1887; figs. 3 and 4, flowers, × 1, from type; fig. 5, ovary, style and filaments, × 3, from type; fig. 6, capsule, × 1, from Florida, A. H. Curtiss.

**Specific Distinctions between Polygonatum biflorum and P. canaliculatum.**—More than a decade ago, while studying with me, Dr. W. A. Anderson, Jr. clearly worked out the proper nomenclature and the specific characters of our American species of *Polygonatum* and, although he published his study of *Trillium* in Tennessee, he has, unfortunately, not stated in print his conclusions regarding *Polygonatum*. In the Manual range we have three indigenous species, *P. pubescens* (Willd.) Pursh, quickly distinguished by having superficial rhizomes, minutely pilose or hirtellous lower leaf-surfaces, lowest peduncle usually from the 1st or 2nd leaf-axil, perianth 7–13 mm. long, with stamens inserted high on the tube; and *P. biflorum* (Walt.) Ell. and *P. canaliculatum* (Muhl.) Pursh (*P. commutatum* (R. & S.) Dietr. and *P. giganteum* Dietr.), formerly needlessly confused and, judging from recent identifications, not usually understood, two very different species with deep-seated rhizomes, glabrous lower leaf-surfaces, lowest peduncle usually from the 3d–5th leaf-axil, perianth 1–2 cm. long, stamens inserted near middle of

the tube. Dr. Anderson, with the collaboration of Mr. C. A. Weatherby, found so many distinctive characters and in my own detailed study so many others become evident that it may be helpful to others to have these distinctions pointed out. The usual failure clearly to separate the two species, *P. biflorum* and *P. canaliculatum*, is reflected in many recent local floras. Thus Wiegand & Eames in their very helpful and usually keenly discriminating Flora of the Cayuga Lake Basin give two types of habitats for their inclusive *P. biflorum*: “Sandy or gravelly, rarely clayey, banks and thickets, in subneutral soil, on dry hillsides and hilltops, or in alluvial calcareous soils on river banks”. Several of the collections cited by them are represented in the Gray Herbarium. Those from “Sandy or gravelly... banks”, etc. are characteristic *P. biflorum*: “dry ravine bank, between Renovick and McKinney’s”, etc., these plants having the characteristic slender rhizome, slender stem only 6-7 dm. high, flat and relatively few-nerved, merely sessile leaves, lowest peduncle from the 3d leaf-axil and 1.2-2 cm. long, with the 2 or 3 pedicels 0.5-1.4 cm. long, and slender perianth with lobes 3.5 mm. long. The material from “alluvial calcareous soils” is characteristic *P. canaliculatum*: “Valley of Inlet, Ithaca”, etc., the plants with rhizome more than 2 cm. thick, stout stem (1 cm. thick) 2 m. high, with clasping-based corrugated and undulate-marginated leaves with about 200 nerves, the flowering peduncles up to 9 cm. long, with 4-7 pedicels up to 2.5 cm. long, the thicker perianth with lobes 6 mm. long. Again, in that compendium of accurate local field-observation, Deam’s Flora of Indiana, the author, beautifully distinguishing the pubescent-leaved *P. pubescens*, with superficial rhizome, from the glabrous-leaved plants with deep-seated rhizomes, which he unwillingly treated as one species, *P. biflorum*, wrote: “My study of this species complex was made from 155 specimens which I have collected from all parts of the state. I am not satisfied with the treatment of this species but I am not able to find differences sufficient to separate them... I do not think them all the same species... The genus has been monographed by three authors and my specimens have been seen by one of them but I cannot accept their treatment of this complex.” Such observations indicate the need of better statements of the char-
acters, and the misidentifications in the herbaria (including our recent collections from Virginia as identified by a student of the group) also indicate such a need.

Very briefly my conclusions follow:

**Polygonatum biflorum** (Walt.) Ell. Rhizome 0.6-1.5 cm. thick; stem slender, 1.5-5 mm. thick below lowest leaf, 2-9 dm. high; leaves flat, sessile or nearly so, narrowly lanceolate to broadly ovate, the largest ones (of each plant) with 46-120 nerves and 5.5-15 cm. long by 1.2-6 cm. broad, the terminal small ones 20-66-nerved; peduncles 1-4 cm. long, 1-3 (-5)-flowered, the lowest usually borne from the 3d (1st-5th) axil; pedicels becoming 0.5-2 cm. long; perianth slenderly cylindric, 1-1.7 cm. long, its lobes 3-4 mm. long; filaments commonly papillate or granulose, slender; enlarged terminal joint of fruiting pedicel cup-shaped or campanulate, with the rim flaring, 0.7-1.5 mm. long, often as broad; seeds 2.7-3.5 mm. long.—Dry to moist, sandy, loamy or rocky woods and thickets, Florida to Texas, north to Connecticut, New York, southern Ontario, southern Michigan, Illinois, Iowa and Nebraska.

**P. canaliculatum** (Muhl.) Pursh. Rhizome 1.5-3 cm. thick; stem stout, 0.5-1.3 cm. thick at lowest leaves, 0.6-2 m. high; leaves more or less corrugated and with puckered margin (not drying flat), mostly narrowed to broad clasping or sheathing sub-petiolar bases, the larger ones with 110-220 nerves and 0.9-2.5 dm. long by 3.5-13 cm. broad, the smallest terminal ones 58-112-nerved; peduncles becoming 1.5-9 cm. long, 2-10-flowered, the lowest commonly borne from the 4th or 5th (3rd-8th) axil; perianth thick-cylindric, 1.7-2 cm. long, its lobes 5-6.5 mm. long; filaments broad, smooth or merely granulose; enlarged terminal joint of fruiting pedicel sub-cylindric to slenderly campanulate (except at flaring summit), 1-3 mm. long, usually longer than thick; seeds 3-4.5 mm. long.—Rich woods, alluvial thickets, river-silts and other calcareous habitats, Connecticut Valley of New Hampshire to southern Manitoba, south to South Carolina, Tennessee, Missouri and Oklahoma.

Many reputed species and varieties have been proposed, based upon shade of color, breadth of leaf, etc. These I am not here discussing. That is for a monographer who has studied them all. So far as I have seen they do not affect the fundamental specific characters of the species long ago defined. In fact, I have recently been challenged to point out any real characters distinguishing *P. canaliculatum* from *P. biflorum*. The above is my answer. What better characters could be found in the Liliaceae?
The position of the lowest peduncle, a splendid character pointed out by Deam, is certainly significant. I have noted its position in all specimens in the Gray Herbarium and that of the New England Botanical Club. The results follow.

P. pubescens: of 365 plants 100 (27+ per cent.) have the lowest peduncle from the 1st axil, 241 (66+ per cent.) from the 2nd, 20 from the 3rd and only 1 from the 4th.

P. biflorum: of 116 plants 3 have the lowest peduncle from the 1st axil, 12 (10 per cent.) from the 2nd, 68 (59+ per cent.) from the 3rd, 28 (24+ per cent.) from the 4th, and 5 from the 5th.

P. canaliculatum: of 41 specimens 4 (10 per cent.) have the lowest peduncle from the 3rd axil, 17 (41+ per cent.) from the 4th, 13 (31+ per cent.) from the 5th, 1 from the 6th, 2 from the 7th, and 1 from the 8th.

A biologically interesting form, because flowering from elongate leafy axillary branches, of Polygonatum biflorum is


The Indigenous Alleghenian Convallaria.—The native Lily-of-the-Valley, occurring in acid rocky or sandy woods, summits and upper ravines of the mountains from Virginia and eastern West Virginia to northern Georgia and eastern Tennessee, is much larger than the European Convallaria majalis L., the plant so generally cultivated and naturalized near settlements; and, as Professor Massey writes me, no one knowing its stations high on the mountains would think of calling it “of the Valley.” In the European species the scape is elongate, so that the flowers are borne opposite the middle or upper halves of the leaves; the leafy axis (to the base of the upper leaf) is, except in highly cultivated plants, 5–12 cm. high, with the larger leaves 1–2 dm. long and 3–7.5 cm. broad, their veins and cross-partitions, as seen by transmitted light, relatively faint and pale; the longer bracts of the raceme are lanceolate, 4–10 mm. long, and much shorter than the pedicels; and the seeds are nearly globose. In the native eastern American species the scape and raceme are shorter than the leafy axis or barely reaching the lower half of the lowest leaf; the leafy axis is 1.5–2 dm. high, with the larger clear green (not glaucescent) leaves 1.5–3 dm. long and 4–12 cm. broad, strongly nerved, the dark nerves and cross-partitions sharply visible by transmitted light; the longest bracts of the
raceme are almost linear, 0.8–2 cm. long and nearly equaling to
much exceeding the pedicels; and the seeds are compressed,
either oblate or somewhat lenticular.

In recent years the Alleghenian native has been known as
Convallaria majuscula Greene in Fedde, Rep. Nov. Spec. v. 46
(1908). Greene proposed two species, C. globosa, l. c., a plant
cultivated by the late Robert Ridgway who received it from a
dealer as found in the mountains of North Carolina, and C.
majuscula, “occasionally collected in the higher mountains of
Virginia, from the Peaks of Otter northward; also in those of
southeastern Pennsylvania. . . . it differs totally from
that [C. majalis] in its very large light-green leaves without
trace of bloom, with excessively fibrous anatomy, insomuch that
the surface of the leaf when growing looks to be plicate rather
than plane and even. Both these American species . . .
when compared with C. majalis, flower much later, their foliage
perishing at the end of summer.” There are no evident specific
characters separating the cultivated C. globosa and the indigenous
plant of western Virginia, therefore the name C. majuscula has
come into use.

There is, however, a perfectly available name for the native
plant, which was well described 68 years before Greene’s publica-
tion. This is Convallaria montana Raf. Aut. Bot. 66 (1840).
Rafinesque’s account, quite as good as Greene’s, was as follows:

486, Conval, montana Raf. (pseudlo-majalis Bartr. in Rees cycl. Am. ed.)
fol. binis sessilib. ovatobl. acum. scapo angul. fol. subeq. racemo 10-12
floris, bract. lanc. ad ped. eq. fl. secundis—Unaka and Cherokis Mts.
large plant, leaves 6 to 8 inches long, 2 wide, fl. size of C. majalis. Bartram
says the berries are blue and ovate. C. majalis has leaves petiolate
elliptic acute at both ends, raceme of 7-8 fl. bracts half length of pedicels.

Rafinesque had, also, a Convallaria parvisflora, l. c. with “seaco
filif. fol. brevior.” etc., from “Appalachian and Wasioto Mts.”
Whether this was small-flowered C. montana or the introduced
plant I do not feel certain, but the identity of C. montana and
C. majuscula can hardly be questioned.

From Rafinesque’s reference to Bartram it would appear that
the latter had still earlier given the correct name to our native
Convallaria. In Rees Cycl. Am. ed. x. (1810 or later), after the
original British treatment there occurs the following unsigned
and bracketed note:
[To these we will add, from Bartram, *C. pseudo-majalis*, mountain lily of the valley. This charming plant is indigenous to the mountainous parts of the United States of America, particularly the country of the Cherokees, in the rich glades or shady valleys in their mountains, and in the like situations in Pennsylvania. It differs but little from *C. majalis* of Europe, only is larger every way, and the fruit blue and more oblong to ovate.]

Here, of course, was where Rafinesque got his quotation from Bartram about the blue berries. In his *Travels* (1791) Bartram repeatedly noted *Convallaria majalis* from the upper slopes of the Cherokee country but I have been unable to find him giving in print a new name or noting the "blue" berries. Since *C. montana* (or *C. majuscula*) has, as I am assured by Professor Massey and others who are familiar with it in the wild, red berries we can hardly accept *C. pseudo-majalis* as properly diagnosed. Bartram could quite as well have had *Polygonatum*!

The synonymy of our native species is as follows:


**Trillium Catesbaei and T. nervosum Ell.** (Plates 810 and 811).—Elliott, *Sk.* i. 429 (1817), described two new species, *Trillium Catesbaei* and *T. nervosum*. The first, which he took to be the same as the plant illustrated by Catesby, Nat. Hist. Carol. etc., i. t. 45, as *Solanum triphyllon*; flore hexapetalo, carneo (our Plate 811, fig. 1) was described as follows

8. Catesbaei. E.

T. pedunculo recurvato; petalis lanceolatis, calyce majoribus; foliis obovatis ovalibusque, acuminati, basi attenuatis. E.

Catesby, Carol. p. 45, t. 45.

T. cernuum, Michx. 1. p. 216?

Leaves 4-6 inches long, rather obovate, 3 inches wide, tapering to the base and not abruptly acuminate at the summit. Petals lanceolate, expanding, undulate, rose coloured. Leaves of the calyx long, narrow.

[Then a paragraph of more or less pertinent observation, with the conclusion that his plant, coming from the same region as Catesby's, must be identical.]

Pendleton county, South-Carolina; Mesrs. Baker & Perry.
The second of these new species (our Plate 810, Fig. 2) was

9. Nervosum. E.
T. pedunculo recurvato; petalis oblongo-lanceolatis, calyce majoribus; foliis lanceolatis ovatisque, utrinque acutis, membranaceis, nervosis. E.

Peduncle recurved; petals oblong lanceolate, larger than the calyx; leaves lanceolate and ovate, acute at each end, membranaceous, nerved.

Plant 6-8 inches high. Leaves generally narrower than those of the T. sessile, most commonly lanceolate, membranaceous, somewhat 3 nerved. Peduncles about an inch long. Petals rose coloured.

Grows in the upper and middle country of Georgia and Carolina. Athens; Mr. Green. The T. cernuum of Walter probably belongs to this species.

Now, if anything is clear, it is that the plants which Elliott was describing differed strikingly as follows: T. Catesbaei with "rather obovate" leaves 3 inches broad, T. nervosum with them lanceolate and ovate ("most commonly lanceolate") tapering at both ends.

Most fortunately, Elliott's Herbarium, which, in the past suffered serious destruction by insects, mould and the removal of specimens, still contains these two types in good condition. They were photographed in October, 1941, by Mr. and Mrs. Weatherby, their photographs (our Plate 810) now in the Gray Herbarium. Although it is, as said, most fortunate that the types exist and closely agree with Elliott's descriptions, it is most unfortunate that Elliott identified his plant with obovate-oval broad leaves with Catesby's plate and, consequently, called this species T. Catesbaei. The type of T. Catesbaei has elongate, curving stigmas sessile at the summit of the ovary, while its petals are pretty broad to be called lanceolate. The type of the narrow- and tapering-leaved T. nervosum has a definite style capping the ovary (Plate 810, Fig. 2). In other words, the type of T. nervosum is identifiable with T. stylosum Nutt. Now, if Catesby's plate be examined it will be seen (our Plate 811) that the leaves are those of T. nervosum and that, in the Catesby drawing of the fruit (our Fig. 2) there is a definite style. Elliott evidently "got the wires crossed" and identified the Catesby plate with the wrong plant; and Rendle, Journ. Bot. xxxix. 333 (1901), said "In the absence of the specimens which Elliott had before him, Catesby's figure (which he cites) is the only authority for this species." He, therefore, took up T. Catesbaei for the
narrow-leaved plant with definite style as impressionistically shown in Catesby’s plate (impressionistically, because Catesby had the sepals beautifully roseate and petaloid, just like the petals!) and a plant of the Carolina mountains with broadly rhombic leaves he described and illustrated as T. Rugelii Rendle in Journ. Bot. xxxix. 381, t. 426 B (1901). Rendle’s illustration shows broadly rhombic leaves 11.5 cm. wide; material from the same general region, Highlands, North Carolina, April, 1903, Harbison, has them less broadly tapering at base, tending to obovate and 6–9.5 cm. broad; Harper’s no. 1891 from Randolph County, Georgia, generally identified with T. Rugelii, has them in outline nearly as in the type of T. Catesbaei and 9–12 cm. broad; and Harper’s no. 3492 from Tuscaloosa County, Alabama, has them definitely rhombic-obovate and 7.5 cm. broad; while the type of T. Catesbaei has them 9–10 cm. broad. All these, as I understand the plants, show the usual range of variation in the leaves and are all T. Catesbaei Ell. (1817). They are also T. Rugelii Rendle (1901), for, since “the absence of the specimens which Elliott had before him” is now rectified by looking in Elliott’s Herbarium at Charleston, not in the British Museum, the identity of T. Catesbaei has become clarified.

Early Carolina botanists clearly recognized that T. nervosum Ell. (1817) was the same as T. stylosum Nutt. (1818) and many sheets from M. A. Curtis had both names (often bracketed) on their labels. They were right. The error occurred when T. nervosum was dropped (as by Small) and T. Catesbaei (following the gratuitous assumption of Rendle) was wrongly used in the sense of T. stylosum.

In plate 810, fig. 1 is the type of Trillium Catesbaei Elliott, × 1, after a photograph by C. A. and Una F. Weatherby. Figs. 2 and 3, T. nervosum Ell.: fig. 2, the type-sheet × ½, after a photograph by C. A. and Una F. Weatherby; fig. 3, detail of flower in central specimen of fig. 2, to show style, × 3.

Plate 811, figs. 1 and 2, portions of Catesby’s plate of Solanum triphyllum; flore hexapetalo, carneo, Nat. Hist. Carol. i. t. 45: fig. 1, flowering summit, × 1; fig. 2, fruit, showing style, × 1. Fig. 3, leaf, × 1, of type of Smilax Bonanox L., var. exauriculata Fernald.

Rafinesque's description of *Trillium flexipes* was unusually good, for him:

968, *Tril. A* [i. e. his subgenus *Anthopium*, with peduncled flowers and sessile stigmas] *flexipes* Raf. caule sulcato, fol. sessil. obovatis acuminatis undul. 3nervis, pedunc. equante inclinato flexuoso, calix lanceol. acum. petalis albis eq. obl. acut. undul.—West Kentucky and Tennessee, rare, pedal, leaves 3 inches long, 2 broad, flowers middle size.

The inclined peduncle about equaling (in early anthesis) the sessile, acuminate, obovate leaves, the acuminate, lanceolate sepals and the equal, oblong white petals are all good characters of *Trillium Gleasoni*. That it occurs in western Kentucky there can be no question. Witness Shacklette, no. 378 from Union County, Kentucky. Wiegand & Eames, in their study of the group, cited it from Tennessee in *Rhodora*, xxv. 190 (1923) as did Small (Man.); and it occurs in eastern Missouri. There is no reasonable doubt about *T. flexipes*. The form with maroon or purple petals is


*T. declinatum* Raf. l. c. 135 (1840) and *T. balduiniunum* Raf. l. c. 135 (1840) are probably both forms of *T. nervosum* Ell.

*T. lancifolium* Raf. l. c. 132 (1840) can hardly be anything but *T. recurvatum*, var. (?) *lanceolatum* (Boykin) S. Wats. in Proc. Am. Acad. xiv. 273 (1879), based upon *T. lanceolatum* Boykin in herb. in Wats. l. c. 274 (1879). Watson treated *T. lanceolatum* as a doubtful variety of the northern and wide-ranging *T. recurvatum* Beck, but, as Small, Bull. Torr. Bot. Cl. xxiv. 171 and 174 (1897), showed, the two are well distinguished species. Small (Man.) gives the range of *T. lanceolatum* as "W. Fla. to La., Tenn. and Ga." and in *Rhodora*, xlv. plate 773, fig. 3 (1943), I showed, life-size, the summit of a characteristic plant, X 1, from northwestern Florida, the original specimen 11 inches high. If Rafinesque’s description be compared with this figure the identity of *T. lanceolatum* Boykin (1879) and *T. lancifolium* Raf. (1840) will be apparent:

962, *Tril. S.* [subgenus *Sessilium*] *lancifolium* Raf. caule elato, fol. sess. lanceol. acutis trinervis patulis planis sepe maculatis, calicib. patulis vel reflexis, petalis erectis longior rubris unguic. lanceol.—Florida to Alabama and Apalachian Mts. stem often pedal leaves 3 inches, flowers uncial.
As to "flowers uncial.", the petals vary from 1.5–4.5 cm. long, the lower measurement being less than "uncial."

We do not know true *Trillium lancifolium* (*T. lanceolatum*) in the Gray's Manual area, although Rendle, Journ. Bot. xxxix. 327 (1901), referred to "Specimens which I have seen from Kentucky (Short)". The specimens which are in American herbaria, accompanied by Short's label with the print, "C. W. SHORT, M.D. KENTUCKY, 1840" fortunately bear, in his hand, the written memorandum, "From Dr. Boykin, Ga.". In other words, they are isotypes of Boykin's species.


*Trillium cuneatum* was thus described:

964, *Tril. S.* [subgenus Sessilium] *cuneatum* Raf. caule elato, fol. sessilis. ovatob. acutis trinervis planis concolor, calicib. erectis obl. petalis cuneatis duplo longior acutis purpurascens.—Unaka Mts. of Cherokis, pedal leaves 3 inches, flowers large akin to those of *Tr. maculatum*, but leaves very different.

It is most difficult to believe that Rafinesque's plant from the Cherokee country, with ovate-oblong acute green leaves, oblong sepals and cuneate purplish petals twice as long as the sepals is not the characteristic large-flowered *T. Hugeri* (type from Tryon Mt., North Carolina), which abounds in the Appalachian region from northwestern Florida and Alabama northward to North Carolina and Kentucky. Rafinesque compared it with his earlier published *T. maculatum*, "of the coastal plain and piedmont regions from the Carolinas to Alabama and Mississippi", with, further, to quote Dr. W. A. Anderson in Rhodora, xxxvi. 122, 123 (1934), "leaves . . . lance-ovate, . . . strongly mottled, mottling tending to form longitudinal stripes; sepals 2.5–5 cm. long. . . . lanceolate, acute; petals 3.5–6 cm. long". Anderson, identifying *T. maculatum* Raf. (1830) with *T. Underwoodii* Small (1897), said "Among the numerous species of *Trillium* described by Rafinesque, this one is unmistakable".

By Small (Man.) his Coastal Plain *Trillium Underwoodii* (*T. maculatum* Raf.) is, in the key, separated from his montane *T. Hugeri* (*T. cuneatum* Raf.) by its narrower leaves ("braeets"), in the former "much longer than wide, often twice as long", in the
latter "nearly or quite as wide as long". From the type-locality and the description T. cuneatum well matches the more oblong-ovate-leaved extreme of the Appalachian T. Hugeri, originally described by Small with "blades . . . bright green [Raf. said 'concolor'] . . . , sepals oblong to oblong-lanceolate [Raf. said 'obl.'], . . . petals oblong-lanceolate to spatulate, purple, somewhat longer than the sepals [Raf. said 'cuneatis duplo longior . . . purpurascens']."

Rafinesque had no less than 34 so-called species and 67 so-called varieties1 of Trillium. A few species, as noted above, were described with sufficient clarity to be recognizable. In these cases his names, when having priority, are automatically taken up. T. flexipes Raf. thus displaces T. Gleasoni Fernald, T. lancifolium Raf. throws out T. lanceolatum (Boykin) S. Watson, T. cuneatum Raf. antedates T. Hugeri Small, and T. maculatum Raf. replaces T. Underwoodii Small. Most of the others are too vague for recognition, others are definite renamings of already properly published species, often with mere undefined varietal names: for instance, T. rotundifolium Raf., with a brief description which is applicable to T. erectum L., and "Var. 1. Flexicaule. 2. Rubricaule. 3. Maculatum. 4. Orbiculatum. 5. Pallidum. 6. Undulatum." These six varietal names are, of course, nomina nuda and have no status; their publication does not indicate a sound mentality or genius as a phytographer. Nevertheless, although (his p. xxi) acknowledging what any clear thinker quickly sees, that "Rafinesque's genius is debatable in the extreme", that "unbalanced . . . he may have been" (his p. 166) and (his p. 263) that "A Dr. Faustus, dangerously experimenting, tempting the rack or devil-ridden madness, would certainly correspond in a crude way to Rafinesque", one of the few monographers of Trillium, Mr. Donald Culross Peattie, becomes ebullient over this erratic and "unbalanced" man, whom, nevertheless, he considers "one of the most prodigious and prophetic scientists of the century 1750 to 1850" (his p. 261)—the century, to mention a few botanists only, of Haller, Linnaeus, Lamarek, Humboldt, Robert Brown, DeCandolle, Darwin, young Gray and his friend, young Joseph Hooker, and

1 Dr. Merrill calls my attention to the fact that Rafinesque, with 67 varieties in Trillium, set a score not achieved by the much advertised Heinz's "57 varieties".
countless others for whom no one has the “nerve” to apologize and who were respected by every one for sanity, clarity and sound scholarship. Peattie, over-enthusiastic about the “prophetic” nature of Rafinesque’s unbalanced work, wrote (Green Laurels, p. 266): “If the rules of priority were strictly and justly applied, Rafinesque would be found to have antedated a large part of the work . . . in botany of Gray and DeCandolle”. Whew! Rafinesque himself might well have written such a sentence; his introverted brain (likewise that of Marcus Jones) frequently brought forth just such statements.

But, returning to Trillium. One of the few monographic studies of Trillium is that of Peattie, Trillium in North and South Carolina, in Journ. Elisha Mitchell Soc. xlii. 192–206 (1927) and, as an outgrowth of this, the treatment of the genus in Small’s Manual (1933). In the former treatment we read (p. 193): “Following Asa Gray, who eschewed anything from Rafinesque’s pen, Sereno Watson reduced to synonymy or varietal rank the greater part of Rafinesque’s . . . names of Trillium. It was not until Small showed the limited nature of T. sessile L. and set off T. Underwoodii and later T. Hugeri that our knowledge of the genus drifted out of the doldrums into which workers like Watson [whose great genius and just fame need no defense], with almost no field knowledge, had put us”.

In view of Peattie’s evaluation of the work of Rafinesque it is, consequently, amazing that he so consistently ignored his 34 species and 67 varieties of Trillium, many of them described from the Carolinas or other Southern States, and that he failed to welcome the opportunity to displace T. Hugeri and T. Underwoodii of Small by Rafinesque’s names of 1840 and 1830 respectively.

Peattie seems to overlook the patent fact that both Asa Gray and his friend Alphonse DeCandolle (dim lights, one gathers, as compared with his hero) regularly took up Rafinesque’s genera and species when they were definite and had priority: Peltandra Raf., including P. undulata and P. alba Raf. Clintonia Raf., with the species C. borealis Raf.; Hexalectris Raf., with the species H. aphylla Raf.; Adiumia Raf., with the species A. cirrhosa Raf.; and so on with scores of other genera. This was far from “eschewing” his work, when sound. It was not the fault of either DeCandolle or Gray that the great majority of Rafinesque’s genera and species had been earlier described or were so vague as to be undecipherable. Neither is it through the “prejudice” imagined by Peattie that earlier specific names have been taken up in Rafinesque’s genera Peltandra, Hexalectris, Adiumia, Cladrastis, Nemopanthus, Osmonthera, etc., nor that later monographers have discarded his genera Didiplis, Steironema, Iysanthes, etc. Koehne, Handel-Mazzetti and Pennell, who made these generic reductions, had no “prejudice” against Rafinesque’s work, when understandable. Dramatic and unfounded statements have no place in real science; they belong in fiction.
If anyone has "eschewed anything from Rafinesque" it is the author of a recent monograph who has ignored all but 4 (scarcely 4 per cent) of Rafinesque's published names in the genus—these all reduced by the admirer of that "prophet" to synonymy.

(To be continued)
CONSIDERED SPECIES, TRANSFERS AND NOVELTIES IN THE FLORA OF EASTERN NORTH AMERICA

M. L. FERNALD

(Continued from page 21)


Smilax Pseudo-China, named from resemblance to the Asiatic Smilax China L., the China radix of Bauhin, was included, along with S. lanceolata L., by Linnaeus in a section of the genus with unarmed terete stems. The treatment was as follows:

*Caule inermi tereti


Smilax virginiana, spinis innocuis armata, latis canellae foliis, radice arundinacea crassa nodosa & carnosa. Pluk. aim. 349, t. 110. f. 5.


China spuria nodosa. Bauh. pin. 297.

Habitat in Virginia, Jamaica.

It is at once evident that, as usual, Linnaeus had no clear understanding of American species and that his citations covered different species. The phrase “Caule inermi” of his major grouping of the primary diagnosis (of the plant he had actually before him in his own herbarium), of the quotations from Gronovius and from Linnaeus’ Hortus Cliffortianus at once contrast with “spinis . . . armata” of the Plukenet reference and “Smilax aspera” of Sloane. Singularly enough, Alphonse De Candolle in his Smilacées in DC. Mon. Phan. i. 82 (1878), although saying “Linn. Sp. p. 1461 [ed. 2], excl. syn. post Gronov.”, placed it, along with S. rotundifolia, S. glauca, etc. in the group with “Folia persistentia vel subpersistentia” and described it “aculeis in caule crebris; . . . limbis margine setaceo-ciliatis”. In other words the S. Pseudo-China, sensu A. DC. (and many followers), not L., is S. Bona-nox L., which was
originally described "foliis ciliato-aculeatis." It, therefore, becomes necessary to determine what Linnaeus actually had in his own herbarium prior to 1753. Fortunately there is a characteristic sheet of foliage marked by Linnaeus "K. Pseudo-China". This, undoubtedly collected by Kalm ("K") in New Jersey or Delaware, is characteristic S. tammifolia Michx. Fl. Bor.-Am. ii. 238 (1803). A portion of the Linnean type is reproduced as our Fig. 2. The first Gronovian reference given by Linnaeus is supported by a fruiting branch in the herbarium of Gronovius at the British Museum, badly crumpled and unsightly, also by a very beautiful flowering plant (our Fig. 1). These are likewise S. tammifolia with very long peduncles. The third reference, to Hortus Cliffortianus, carries back to the Pluketet figure cited by Linnaeus, which is of some woody species, presumably S. Walteri Pursh, since its foliage will do for that species and, in the place cited, Pluketet identified it with Virginian specimens with "baecis coccineis"; and the second Linnean reference to Gronovius is supported by a characteristic lateral sprig of flowering S. rotundifolia! The Smilax aspera of Sloane need not specially concern us, since it is so clear that the primary material, the plant which Linnaeus had in his own herbarium and the two Clayton (Gronovian) specimens with smooth stems are so definitely the true type and syntypes of S. Pseudo-China. The beautiful photograph sent from Paris of the type of S. tammifolia Michx. is unequivocal. It is, consequently, worth noting that Michaux thought it might be the S. caule tereti, foliis inermibus: caulinis cordatis, ramorum lanceolatis, pedunculis longissimis of Gronovius (our Fig. 1). The point which Michaux did not note is, that this was the best syntype of S. Pseudo-China L. (1753).

Further showing the utter confusion of Linnaeus in interpreting North American species of Smilax is the fact that, although he described in his section with Caule aculeato, tereti a new species as S. tamnoides L. Sp. Pl. 1030 (1753), the specimen in his own herbarium marked S. tamnoides is an unusually good piece of unarmed, herbaceous-stemmed S. Pseudo-China (S. tammifolia Michx.) while the Catesby plate, from which the characters were obviously drawn, is of a prickly-stemmed, evergreen, high-climbing and broad- and eciliate-leaved extreme of an-
other species! In fact, the specimen preserved by Linnaeus as representing his *S. tamnoides* not only has the unarmed stem, the slightly panduriform leaves, the long peduncles and loosely globose inflorescence of *S. Pseudo-China* (*S. tamnifolia* Michx.). One of its inflorescences even shows with diagrammatic sharpness the elongate-clavate styles of that species.

In my conclusion that the plants selected are the real types of *Smilax Pseudo-China* I am quite in agreement with Dr. Pennell who, in 1916, wrote:

*Smilax Pseudo China* L. l. c. 1031. 1753. "Habitat in Virginia, Jamaica." Species clearly aggregate, represented in the Linnaean herbarium by specimens written up by Linnaeus as follows, according to a letter of B. D. Jackson: "three sheets pinned together; the first is 'II K Pseudo China', it is a barren branch, the leaves leathery; the second sheet is written up 'II' and seems quite the same plant as the former, but has one berry, the third sheet is of a West Indian species, coll. by Patrick Browne in Jamaica, probably *S. celastroides*." From the wording of the Linnaean description none of these can be considered the type of *S. Pseudo China*, but this would be rather a specimen of Gronovius, also studied by Linnaeus, now in the Gronovian herbarium in the British Museum. The description of Linnaeus is word for word from Gronovius, except for the addition of the phrase "racemis ovato-oblongis," inappropriate for any *Smilax* whatever. "Smilax caule tereti inermi: foliis inermibus, caulinis cordatis, ramorum lanceolatis; pedunculis longissimis," Gronovius, Fl. Virg. 156. 1742, citing Clayton’s Nos. 541, 561 and 630 (for No. 541 see above note under *S. herbacea*). These two numbers are identified by Dr. A. B. Rendle as both the same as No. 541, that is, as genuine *Smilax herbacea* L. For the verification of these two Linnaean types I am indebted to Dr. B. Dayden Jackson, of the Linnaean Society of London, and to Dr. A. B. Rendle, of the British Museum.—Pennell in Bull. Torr. Bot. Cl. xliii. 413, 414 (1916).

Unfortunately, Pennell did not himself see the specimens discussed; had he done so he certainly would not have reduced *Smilax Pseudo-China*, correctly typified by him, to *S. herbacea* L. He depended upon identifications by the late Drs. B. Daydon Jackson and A. B. Rendle, neither of whom clearly understood the species involved. The plant generally passing as *S. herbacea* rarely if ever has any tendency to panduriform leaves. Its leaves, varying from oblong-ovate to cordate-subrotund, are glaucous and glabrous beneath, the flowers much larger than in *S. Pseudo-China*, with the styles rather broadly lingulate, the berries glaucous. Whether the type of *S. herbacea*, from Vir-
ginia (Clayton), is of this species (S. pedunculata Muhl.) or S. pulverulenta Michx. can be determined only by actual (future) examination of the material. The two photographs of the specimens (one sheet in Herb. L., the other in the Gronovian Herbarium) are of identical plants. The foliage is young, but it looks green and lustrous beneath, as in S. pulverulenta Michx. Until the specimens can be actually studied we may retain the names S. herbacea and S. pulverulenta as currently used.

Although Pennell, l. c. 414, placed Smilax inermis Walt. Fl. Carol. 244 (1788), as well as S. Pseudo-China, in the synonymy of S. herbacea, rather than place them with S. tammifolia, it now seems clear that Walter’s species was identical with S. Pseudo-China. Pennell said “Type, presumably from Berkeley County, South Carolina, not verified”. Walter’s diagnosis was perfectly good for S. Pseudo-China; Berkeley County is on the outer Coastal Plain and it is notable that Pennell’s only stations, in his early paper, for S. herbacea from Virginia (south of Fairfax County) North Carolina, South Carolina and Georgia were all from along the Blue Ridge or the Alleghenies, while he specially designated the area of S. tammifolia as “Coastal Plain; Long Island to South Carolina”. In the Gray Herbarium, as in those studied by Pennell, there is no so-called S. herbacea from the Coastal Plain from south of Virginia. Walter’s S. inermis, “presumably from Berkeley County, South Carolina”, had the weak (“infirmo”) stem only 3 feet high (“tripedal”). The southernmost specimens in the Gray Herbarium of S. Pseudo-China are three from Berkeley County, South Carolina (Santee Canal, Ravenel; west of Chicora, Godfrey & Tryon, no. 868; Moncks Corners, Godfrey & Tryon, no. 1411), one from Charleston County, South Carolina (north-northwest of McClellanville, Godfrey & Tryon, no. 1112) and one from eastern Georgia (Savannah, Mrs. Say). Incidentally there are in the Gray Herbarium no specimens (not even from Wilmington) from North Carolina and Pennell saw none from that state. Is it really absent from or rare in the broad area between southern South Carolina and southeastern Virginia? This gap is frequent in the known ranges of many species.

Nemexis elliptica Raf. Aut. Bot. 131 (1840) with stem “6 to 12 inches high, leaves uncial”, the stem with quadrate, elliptic
leaves acute at each end, from Alabama, might have been *Smilax Hugeri* (Small) J. B. Norton in Pennell in Bull. Torr. Bot. Cl. xliii. 420 (1915), based upon *Nemexia Hugeri* Small (1903). Since the combination *Smilax elliptica* already exists for other species Rafinesque’s *Nemexis elliptica* need not disturb us, but by those who maintain *Nemexia* as a genus it must be considered.

Another and quite clear synonym of *Smilax Hugeri* is *S. herbacea* sensu Walt. Fl. Carol. 243 (1788), not L. His “caule annuo inerme stricto suberecto 2–5 pedali, simplici, foliis verticillatis ovatis . . . cirrhis obsoletis”, etc. are unequivocal for a plant which is well known from southern and southeastern South Carolina and from Georgia.

**Smilax Bona-nox** L., var. *exauriculata*, var. nov. (tab. 811, fig. 3), foliis oblongo-lanceolatis subacuminatis basi cordatis nec panduriformibus, margine setoso-ciliatis.—**VIRGINIA**: Norfolk, Reed? (type in Herb. Gray.).


As it extends northward into eastern Virginia (more locally northward) *Smilax Bona-nox* is nearly as variable as farther south. In this northeastern area of its broad dispersal it occurs in three (perhaps four) quite definite variations. Typical *S. Bona-nox* L. Sp. Pl. 1030 (1753) was, most exceptionally, not so much confused as most of Linnaeus’s North American species. Although he included a West Indian shrub of Bauhin, he gave the “*Habitat in Carolina*” and the species rests primarily on *Smilax*, *foliis latis in margine spinosis, caroliniana, stipite quadrato*, Pluk. Aim. 348, t. 111, fig. 3; the Linnean diagnosis drawn directly from Plukenet: “SMILAX caule inermi [because Plukenet had merely a sterile tip] angulato, foliis ciliato-aculeatis.” Typical *S. Bona-nox*, therefore, is the slender, straggling and rarely climbing, freely branched shrub with deltoid-ovate to slightly panduriform leaves usually mottled with white, the rounded basal lobes short and tapering into the upper part of the blade, the margins bristly-ciliate. Its northern limit seems to be in Wicomico County, Maryland (*J. J. Carter* in Herb. Phil. Acad.).
Linnaeus picked up another of Plukenet’s figures. This was *S. Bona-nox* s. of L. Sp. l. c. "Smilax caroliniana, stipite quadrato leni, foliis angustis asperis auriculatis ad basin angulosis. Pluk. alm. 348, t. 111. f. 3.” Somewhat later this was taken up as a species: *S. hastata* Willd. Sp. iv². 782 (1806), Willdenow emphasizing the point shown by Plukenet, that the very narrow leaves are “margin ciliato-aculeatis”. This extreme with narrowly lanceolate bristly-ciliate blades with narrow divergent basal lobes occurs occasionally in the Carolinas and southward. The Virginia material is slightly transitional but may be called *S. Bona-nox*, var. *hastata* (Willd.) A. DC. in DC. Mon. i. 79 (1878).

The third variety with strongly bristly-ciliate leaves is the very extreme plant described above as var. *exauriculata*. The type material is an old sheet from Norfolk, collected probably by Reed who got in the neighborhood of Norfolk several species otherwise and not recently known from Virginia. Var. *exauriculata* is very extreme in having elongate oblong-lanceolate, tapering, ciliate-margined leaves with nearly parallel sides and cordate (not hastate or subhastate) bases. It piques the curiosity! The specimen was sent out as *S. hastata*, var. *lanceolata* Pursh. It can hardly be that, however. Pursh gave no new description; he was simply giving a name to the *S. lanceolata* Walt., perhaps not L.: “caule angulato spinoso; foliis longis angustis lanceolatis inermibus”. Var. *exauriculata* could not be described “foliis inermibus”. I am tentatively placing with it a sheet from dry bank, Santee Canal, 5 miles west of Pineville, Berkeley County, South Carolina, *Godfrey & Tryon*, no. 630 (distrib. as *S. glauca*). Its leaves are chiefly oblong, rather than lanceolate.

The extreme of *Smilax Bona-nox* with “foliis inermibus” is a coarse and usually high-climbing shrub with ovate, deltoid or broadly panduriform leaves usually green above and with eciliate or very weakly and casually ciliate leaves on the fertile branches. Basal sprouts may have ciliate and mottled leaves but the foliage of the adult branches is rarely so. This often high-climbing vine has the leaves up to 8 (on sprouts to 12) cm. broad and in good development is very different from typical *S. Bona-nox*. It is var. *hederaefolia*, which rests on *S. hederaefolia* “Beyrich ined.” ex Kunth (1850), treated by Alphonse DeCandolle as *S. Bona-nox*, subsp. *hederaefolia*. Beyrich’s
original material was from shores of Savannah River, Georgia. To this citation DeCandolle added "Virginia (Rügel . . . )". Var. *hederaefolia* is the commonest extreme of the species. In southeastern Virginia it abounds on damp shores or in low woods, the typical form of the species preferring open and drier habitats. Var. *hederaefolia* reaches Delaware (A. Commons in Herb. Phil. Acad.) and is isolated on Nantucket Island in southeastern Massachusetts.

*Smilax tamnoides* L. Sp. Pl. 1030 (1753) was another species not understood by its author. His species rested upon two items: the first a specimen of the unarmed herbaceous plant which on the next page he described as *S. Pseudo-China*, the plant which has regularly passed as *S. tamnifolia* Michx. The second and sure basis of *S. tamnoides* was the description and plate of *Smilax Bryoniae nigrae foliis, caule spinoso, baccis nigris* of Catesby, Carol. i. 52, t. 52. Linnaeus took his brief diagnosis primarily from Catesby: "SMILAX caule aculeato tereti" and the species was placed by him in the section *Caule aculeato, tereti*. There can be no question that the type of *S. tamnoides* was the Catesby plate.

Catesby’s description was vivid:

This plant shoots forth with many pliant thorny stems; which, when at full bigness, are as big as a walking cane, and jointed; and rises to the height usually of twenty feet, climbing upon and spreading over the adjacent Trees and shrubs. . . . In Autumn it produces clusters of black round berries, hanging pendant to a foot-stalk, above three inches long,” etc.

The only possible competitor is *S. Bona-nox*, var. *hederaefolia*, but that has square or at least 4-angled stems (Catesby’s shrub terete), the leaves are strongly reticulate with prominent cross-veins (Catesby’s not), and the fruiting peduncles are 1–3 cm. long, merely ascending to divergent or rarely recurved (Catesby’s shrub with pendulous fruiting peduncles 5–6 cm. long, with pedicels much longer than in *S. Bona-nox*). Catesby’s plate is a beautiful match for the terete-stemmed plant, with relatively thin though firm, and delicately veined often panduriform leaves, elongate, arching and finally drooping peduncles (up to 6.5 cm. long) and long pedicels, which occurs on the Coastal Plain from Florida to southeastern Virginia (perhaps farther north). This plant has been considered a variety of the wide-ranging, conti-
nternal *S. hispida*, from which it differs in the development of some or many panduriform leaves. It has been designated in the Gray Herbarium by a critical student of the group as a southeastern variety of *S. hispida*, with an unpublished name indicative of its southern occurrence. In the Gray Herbarium there is no material of *S. tammoides*, var. *hispida* (S. *hispida*), the continental plant with leaves regularly ovate, from the Coastal Plain south of Virginia, where it extends from the interior down the calcareous valleys. All specimens from the Coastal Plain of Florida, Georgia and South Carolina have some or all of the leaves panduriform and are typical *S. tammoides*. I have seen no such material from North Carolina.

Pursh, treating *Smilax tammoides* as herbaceous (meaning *S. tammifolia* Michx.) described as *S. pandurata* [he said us] Pursh, Fl. Am. Sept. i. 251 (1814), a species in his **Caule fruticosus; ramis teretibus.** Pursh’s brief description could have applied only to typical *S. tammoides*:


In sandy woods, New Jersey to Carolina. b. July.

Note on *Smilax lanceolata.* — *S. lanceolata* L. Sp. PI. 1031 (1753) was published as follows, under **Caule inermi, tereti**:


Smilax, viticulis asperis, virginiana, foliis angustis laevibus nullis auriculis praedita. *Pluk. alm.* 349 f. 110. f. 4? Raj suppl. 344?

*Habitat in Virginia.*

Differnt nostra a *Plukenetiana aculeorum absentia.*

Linnaeus himself, according to the late Dr. B. Daydon Jackson, had no material and my efforts to secure a photograph of the Hortus Cliffortianus and Gronovian plants have been unsuccessful. The Plukenet figure, cited by Linnaeus in *Hortus Cliffortianus* without query, is available and it is significant that Linnaeus stated that *S. lanceolata* differed from Plukenet’s figure in lacking prickles. It should also be noted that *S. lanceolata* was from

Virginia. During ten seasons in the field my companions and I have sought, in vain, for the familiar rather thin-leaved plant with 3 stigmas and dark red berries which regularly passes as S. lanceolata. This species occurs in our extreme Southern States, Florida to Texas, north into South Carolina and Arkansas. I have seen no specimens of it from north of South Carolina. Everywhere in southeastern Virginia the coriaceous-leaved, evergreen S. laurifolia L. occurs, varying tremendously, with leaves from elliptic-oblong to narrowly lanceolate, obtuse to acuminate, the blades anywhere from 0.6–2 dm. long and 1–7.5 cm. wide. But it is always S. laurifolia, with intermittent tendrils, flowers expanding in autumn, black fruit ripening the second year, stigma and seed 1, etc. In its narrowest-leaved extreme, such as Fernald & Long, nos. 6778 and 13,919, its leaves are narrowly lanceolate and very close to those of the Plukenet figure. Of two sheets of one number retained at the Gray Herbarium, one has the branches as fiercely prickly as in Plukenet's illustration, while the second has them prickleless, as described by Linnaeus. Furthermore, the Plukenet figure is quickly matched by vigorous, prickly, narrow-leaved vegetative sprouts. It is most difficult for one who knows southeastern Virginia to believe that the plant inadequately described by Linnaeus as S. lanceolata was anything but the narrowest-leaved S. laurifolia, the type of which, as shown by the photograph before me, was the broad-leaved phase of the species.

Of great importance in interpreting the confused ideas of Linnaeus is the fact, that in Species Plantarum, after citing the reference to his brief account in Hortus Cliffortianus (which was based wholly or in part on the Plukenet figure) he appended “Gron. virg. 120.” Now, if one looks in Gronovius he will find Smilax treated on pp. 120 and 193. On p. 120 two species have completed treatments, the third treatment was unfinished (as printed) and as an erratum was given on p. 193, “Ibidem linea penultima lege.” The first species on p. 120 had cordate-ovate leaves and was cited by Linnaeus under his S. Pseudo-China. Gronovius included under it “Smilax humillior, floribus dilute luteis, baccis rubris. Cl. n. 82”, which is, of course, S. Walteri Ell. (photograph of the Clayton plant before me). The second species in Gronovius, on p. 120, had “caule angulato
aculeato, foliis dilatato-cordatis” and included “Smilax late scandens Bryoniae nigrae foliis, caule spinoso . . . baccis atro-purpureis. Clayt. n. 81”; i. e., with angulate stems, leaves of Bryony and purple-black berries, it was one of the variations of *S. Bona-nox* L., surely not the red-berried so-called “*S. lanceolata*”. The third species, revised on p. 193, with the admonition to substitute for the account on p. 120, was


*Smilax laevis Lauri folio* of Catesby was the best kind of *S. laurifolia* L.; in fact it was cited by Linnaeus in publishing that species. So too was the *Smilax caule spinoso tereti* (with his own changes to “caule aculeato tereti”, etc.) of Gronovius, p. 193. These, in fact, were the only bases of *S. laurifolia* L. (1753). Surely, there is not much left to stand for *S. lanceolata* L. as a distinct species! One sometimes doubts the wisdom of starting our nomenclature of American plants with Linnaeus (1753). It is almost an exceptional North American species about which he was not hopelessly confused.

As pointed out by Morong, *Bull. Torr. Bot. Cl. xxi. 434* (1894), Asa Gray, thinking of *Smilax lanceolata* in the usually accepted but obviously erroneous sense, as the southern, thinnish-leaved plant with 3 stigmas and dark red 3-seeded berries, “examined in 1881 the specimens in the Herbaria of Enslen and Sherard upon which Pursh founded his species [*S. ovata* Pursh, *Fl. Am. Sept. i. 249* (1814)], and declares positively that they are *Smilax lanceolata*”. *S. lanceolata* sensu Gray, Morong, Small and others is, then, *S. ovata* Pursh, whose description was good except for “berries black”. In the herbarium they always lose their red color. Unfortunately, however, *S. ovata* Pursh (1814) is antedated by a different *S. ovata* Jaume St.-Hilaire (1800).

The first available name for *Smilax ovata* Pursh, not Jaume St.-Hilaire, seems to be *S. Smallii* Morong in *Bull. Torr. Bot. Cl. xxi. 434* (1894). Morong described it from young flowering branches, with staminate flowers only, but a very full sheet of isotypic material before me is surely of the shrub erroneously passing as *S. lanceolata*. Small himself, in his Manual, reduces
to *S. lanceolata* sensu authors, not L., both *S. Smallii* Morong and *S. cinnamomifolia* Small in Bull. Torr. Cl. xxv. 609 (1898), the latter described as having “bluish-black” berries. In his Manual, where he reduces *S. cinnamomifolia*, the berries are called “dull-red”. The type of *S. cinnamomifolia*, Heller, no. 4109, from Arkansas, was in ripe fruit. The isotype in the Gray Herbarium shows the crushed berries darkened, just as are the crushed and dried fruits of the admittedly red-berried shrub.

Until *Smilax Smallii* (*S. lanceolata* sensu most auth., not L.) is really collected in Virginia it may safely be excluded from the flora of the state.

**Four of Rafinesque’s Species of Sisyrinchium.**—In his Autikon Botanikon (Cent. V), 65 and 66 (1840) Rafinesque, with the unusual clarity which contrasted much of his work in this rare volume with the slipshod technique of most of his publications, described four species of *Sisyrinchium*. Since these were overlooked by Bicknell in his detailed study of the genus and find no mention in current floras, it is desirable to note their probable identities. The original descriptions are copied below.

481, *Sisyrinchium flexuosum* Raf. caule dichot. flexuoso anceps, fol. brevis ensatis acutis vix nervosis, spathis lance. diphylis ineq. fl. subeq. 3-4fl. capsulis ovoideis truncatis torulos—Arkansas and Texas, semipedal, leaves 1 or 2 inches, specimens in fruit only.

482, *Sisyr. tenuifolium* Raf. caulis cespitos genicul. filif. 2ang. fol. tenuis angustissimis elong. lin. filif. acutis, spathis 2valvis subeq. lanceol. fl. brevier 2-5fl. petalis obt. cuspids. capsulis globosis—Arkansas and Texas, annual semipedal, leaves 2-4 inches long very slender, fl. blue, larger than in *S. anceps*.

483, *Sisyr. floridanum* Raf. Scaposum, fol. lin. lance. acutis vix nervosis, scapis fol. subeq. lato bialatis, spathis ineq. bivalvis lance. 2-4floris equante, petalis retusis cuspidiatis, caps. obovatis—Florida, found by Baldwin, 4 to 6 inches high, annual leaves 2-4 inches, one line broad, flowers large white.

484, *Sisyr. niveum* Raf. scaposum fol. lin. angustis striatis nervosis acutis, scapis fol. longior bialatis, alis striatis, spathis sepe coloratis 3valvis, 2int. breviss subeq. 1 ext. longissima lance. plicata, 6-8floris. petalis retusi cuspid. capsulis globosis—Alab. Kentucky &c, 6 to 8 inches high, leaves 3 to 5, half line wide, flowers size of *S. anceps*, snowy white, spathas more or less colored of red.

Species no. 481, *Sisyrinchium flexuosum* Raf., not Spreng. (1825), is undoubtedly *S. minus* Engelm. & Gray in Bost. Journ. Nat. Hist. v. 263 (1845). The description might well have been based on the type of *S. minus*, and the description of *S. minus* in
Small’s Manual emphasizes the short leaves (2–7 cm. long) and the capsule “corrugated”. Rafinesque said “capsulis . . . torulos.” Although *S. flexuosum* Raf. was the earliest name for this southwestern species, it was antedated by *S. flexuosum* (L.) Spreng. *S. minus* stands.

Species no. 482, *S. tenuifolium* Raf., suffers the same fate. Rafinesque gave a good diagnosis of *S. Langloisii* Greene, Pittonia, iv. 32 (1899). Compare with Rafinesque’s diagnosis these phrases from Greene’s description of *S. Langloisii*: “Densely tufted and very slender . . . : leaves very narrowly linear, 2 to 4 inches long . . . : stems scarcely aneipital, rather subterete [Raf. said “filif.”] . . . peduncles each with a single small few-flowered spathe, its bracts equal or nearly so . . . . . . perianth large for so small a plant, blue.” Characteristic plants of *S. Langloisii* closely match the account of *S. tenuifolium*. Rafinesque, however, was again out of luck, for there was an earlier *S. tenuifolium* Humb. & Bonpl. ex Willd. (1809). *S. Langloisii* stands.

Species 483, *S. floridanum* Raf., is more puzzling, on account of its large “white” flowers, for, so far as I can make out, no regularly white-flowered species occurs in Florida, unless possibly *S. albidum* Raf. Atl. Journ. 17 (1832). The “scapis . . . lato bialatis”, their height and the leaves 1 line broad would do for *S. albidum*. It may so rest for the present. *S. floridanum* Raf. (1840), however, invalidates the name *S. floridanum* Bickn. in Bull. Torr. Bot. Cl. xxvi. 222 (1899), given to a very slender and pale plant first collected by Nash in high pineland of Lake County, Florida. Various coarser and darker-drying plants probably referable to *S. arenicola* Bickn. (incl. *S. fibrosa* Bickn.) have been wrongly distributed as *S. floridanum*, but an isotype (Nash, no. 13) and such material as Blanton, no. 6952 stand clearly apart. Since there is already a *S. Nashti* Bickn. his *S. floridanum* may appropriately be called


Rafinesque’s species no. 484, *S. niveum* from Alabama and Kentucky, can scarcely be anything but his already described *S. albidum* Raf. Atl. Journ. 17 (1832).
I fully concur in the decision of Dr. Francis Harper in Bartonia, no. 22: 3 (1943), that *Quercus incana* is *Q. cinerea*. Bartram's description was very brief: "*Q. incana*, foliis ovalibus integerrimis subtus incanis." Bartram was describing the trees and shrubs of high gravelly ridges of the upper Ogeechee River in central-eastern Georgia: "This day's journey was for the most part over high gravelly ridges, and on the most elevated hills appeared emerging out of the earth, rocky cliffs of a dark reddish colour; their composition seemed to be a coarse, sandy, ferruginous concrete . . . The trees and shrubs common on these gravelly ridges are as follows, Diospyros, *Quercus rubra* [meaning *falcata*], *Q. nigra*, *Q. tinctoria* or great Black Oak, *Q. alba*, *Q. lobata*, post White Oak, *Q. incana*, . . . *Pinus lutea*, *Pinus taeda*, . . . *Pinus palustris", etc., a rather characteristic group of oxylophytic and more or less xerophytic species. These are the regular associates of *Quercus cinerea*, a characteristic species of dry sands and gravels, which, according to R. M. Harper, *Phytog. Sk. Altamaha Grit Reg. of Ga. Ann. N. Y. Acad. Sci. xvii. pt. I. 249 (1906), "Ranges from the fall-line sand-hills [near Bartram's station] almost to the coast". Ordinarily the leaves of *Q. cinerea* are oblong, but they vary to oval or elliptic in broader-leaved individuals (Small says, "blades elliptic, varying to lanceolate or oblanceolate . . . Sandridges, dry woods, and pinelands.")

Trelease, *The American Oaks*, Mem. Nat. Acad. Sci. xx. 113 (1924), guessed that *Q. incana* Bartr. is the Live Oak, *Q. virginiana* Mill., but Bartram was thoroughly familiar with Live Oak; in fact he mentioned it more often than any other species and would not suddenly, in describing the characteristic covering of the inland Sand Hills, proceed to describe it as a novelty. *Quercus virginiana*, the true Live Oak, so familiar to Bartram, is, from Virginia to Georgia, an evergreen tree primarily of the outermost Coastal Plain. Harper, op. cit., did not know it on the Altamaha Grit which, at its northern boundary, approaches Bartram's station of *Q. incana*. The only representative of *Q. virginiana* in Harper's area is *Q. geminata* Small, which Bartram would have included under *Q. virginiana* and which is
found only well to the south of Bartram's area and in a different soil. So far as I can find, *Q. cinerea* is the only species of the "fall-line sand-hills" which Bartram could have meant by *Q. incana*.¹

**Quercus maritima** Bartr. Trav. 164 (1791). From the "endless wild desert, the upper stratum of the earth of which is a fine white sand, with small pebbles, and at some distance appears entirely covered with low trees and shrubs of various kinds, and of equal height", along St. John's River north of Lake George, eastern Florida. From the description alone, "foliis obovate olivaceis obsolete trilobis minoribus", I do not venture to guess its identity. Too many shrubby species of Florida are candidates. Bartram's *Q. maritima* (1791), however, antedates *Q. maritima* (Michx.) Willd. (1805) and Raf. (1838). The last two were caught by *Index Kewensis*, the earliest of the series not.

**Silene scabra** Raf. Aut. Bot. 18 (1840), from "barrens of West Kentucky", is very definitely *S. regia* Sims (1814). Rafinesque's name, moreover, is invalidated by *S. scabra* Kit. (1814).

**Prunus nemoralis** Bartr. Trav. 408 (1791) should be added to the synonymy of *Padus caroliniana* Mill. Dict., no. 6 (1768) and of *Prunus caroliniana* (Mill.) Ait. Hort. Kew. ii. 163 (1789).

Bartram's species, not entered in *Index Kewensis*, was from above Mobile, Alabama: "Prunus nemoralis, floribus racemosis, foliis sempervirentibus, nitidis."


*Index Kewensis* cites *Stillingia fruticosa* as starting with Spreng. Syst. iii. 805 (1826), while Sprengel credited it to Michaux (1803) who had no such name but described *Stil. ligus-

¹ Even though some might doubt this interpretation of *Q. incana* Bartr. (1791) they can hardly doubt its priority over *Q. incana* Roxb. Hort. Beng. 104 (1814) and Fl. Ind. iii. 642 (1832). The Indian species should, apparently, be called *Q. lanata* Sm. in Rees Cycl. xxix. no. 27 (1819).
trina from “sylvarum umbrosis, ad ripas annium Carolina et Georgia.” Bartram, however, describing the “very curious and beautiful flowering and sweet scented shrubs” northwest of Cape Fear, North Carolina (near Wilmington), enumerated many of them: “particularly Callicarpa, Aesculus pavia, . . . Styrax, Stewartia, . . . Stillingia fruticosa, foliis lanceolatis, utrinque glabris, fructu tricoeco”. Though brief, the diagnosis of this characteristic shrub of the Coastal Plain, northward to southeastern North Carolina, is sufficient. M. A. Curtis in his Catalogue of the Indigenous and Naturalized Plants of North Carolina (1867) cited Stil. ligustrina as occurring in the “Low Dist.”, i. e. on the Coastal Plain, and Wood and McCarthy in their Wilmington Flora, covering the country drained by both the Northeast and the Northwest Cape Fear Rivers, also listed it. In both lists the species is recorded on the authority of Dr. J. F. McRee, who was born at Wilmington and later had a plantation some miles north of that city.

Cyrilla racemiflora L., var. subglobosa, var. nov. (tab. 813, fig. 1 et 2), foliorum venis subtus vix prominulis; sepalis ovatis 1 mm. longis; fructibus depressis subglobosis sulcatis; stigmatibus perbrevibus.—Virginia: wooded swamp along Mill Creek, about 1 mile north of Skipper’s, October 14, 1938, Fernald & Long, no. 9600 (type in Herb. Gray.; isotype in Herb. Phil. Acad.).

Typical Cyrilla racemiflora has a characteristic conic-ellipsoid or -ovoid drupe definitely longer than broad, though in exceptional specimens only slightly longer. In ripe material the drupes (fig. 3) show a continuous rounded surface with little or no sign of furrowing and the styles and stigmas are rather prominent, the lanceolate to lance-ovate sepals are 1–1.8 (usually 1.5) mm. long, their sharp tips evident beyond the half-diameter of the fruit. In typical C. racemiflora, furthermore, the mature foliage is usually prominently reticulate-veiny beneath. Var. subglobosa, the type in ripe fruit, collected in mid-October, has the reticulum of the lower, as well as the upper, leaf-surface rather faint; the sepals are the shortest in the species, 1 mm. long and ovate; and the depressed-subglobose drupes (figs. 1 and 2), definitely as broad as or broader than high, so that the sepals are relatively hidden, are broadly rounded to an almost emarginate summit and with a deep longitudinal furrow running
from base to apex and marking the boundaries of the 2 carpels; the style and stigmas are the shortest in the species.

Although occasional specimens of the wide-ranging and more typical *Cyrilla racemiflora* approach in one character or another the shrub from near Skipper’s, the latter combines so many of these exceptional characters that I am designating it as a variety. Flowering material may show other differences.

In shape of drupe Var. *subglobosa* suggests the fruit described by Rafinesque for his *Cyrilla polystachya* Raf. Aut. Bot. 8 (1840), with “capsulis subgloboosis”. That shrub of Louisiana and Florida was described, however, as having the “fol. ... imis ... acutis ... racemes 6 to 8 inches”. It is most probably a phase of the narrow-leaved and small-fruited *C. parviflora* Raf., l. c., which differs in several characters from *C. racemiflora*.

In plate 813, figs. 1 and 2 are of type of *Cyrilla racemiflora* L., var. *subgloboosa*: fig. 1, portion of branch, X 1; fig. 2, portion of fruiting raceme, X 5. Fig. 3 is a portion of a fruiting raceme of typical *C. racemiflora*, X 5, from west of Winfield’s Mill, Dinwiddie County, Virginia, Fernald & Long, no. 13970.


The tree known as *Aesculus neglecta* is characteristic of woodlands along streams in central and eastern North Carolina and southeastern Virginia. In the latter state it reaches the inner border of the Coastal Plain along the Meherrin River, below Emporia. From North Carolina Sargent cites specimens from the Piedmont eastward to the fall-line sand-hills or the inner margin of the Coastal Plain: Alamance, Orange, Durham and Wake Counties, on Cape Fear drainage or (the Wake County station) on the Neuse. According to Lindley’s original account and plate the flowers are cream-colored or pale-yellowish, “and beautifully veined with red; the lateral petals are also pinkish”. The red and pink coloring may sometimes be nearly absent but the non-glandular pedicels and calyx, which characterize the species, hold. Bartram, ascending “the North West of Cape Fear” River, found “Aesculus sylvatica, floribus ex albo et carneo eleganter variegatis, caule arboreo”. What else could it have been than *Ae. neglecta*, with “flowers ... beautifully
veined with red”, the species characteristic of eastern North Carolina and adjacent Virginia, South Carolina and Georgia, which Sargent cites from definite stations on Cape Fear River? The name was not recorded in Index Kewensis.

Neither did Index Kewensis pick up *Aesculus floridana* Bartram, l. c. 401 (1791) from northern Florida, described: “Aesc. Florid. ramis divaricatis, thyrsis grandis, floeculis expansis incarnatis.” What he had I do not know. He was definitely distinguishing it from *Ae. Pavia* which he enumerated in the same list. If the latter species is ever subdivided Bartram’s species must be taken into account.

*Vitis campestris* Bartram, Trav. 400 (1791), not Nutt. in Fraser’s Cat. (1813) nor Baker in Mart. Fl. Bras. xiv². 200 (1871). *V. rotundifolia* Michx. Fl. Bor.-Am. ii. 231 (1803).

*Vitis rotundifolia*, the Muscadine, and its pale-fruited form, the Scuppernong, are among the most familiar and most prized wild grapes of the Southeastern States. When fully ripe the large grapes are intensely sweet and are harvested in great quantities for preserving. Unlike the great majority of our grapes, this species has few and simple tendrils, instead of many and forking ones. Consequently, although it may climb high when opportunity presents, it is most often sprawling over bushes or reclining on the sand or gravel, so that, in such habitats, its often too tempting and almost over-sweet berries are gathered by stooping. Thus, Elliott said: “This species of vine varies much in size, sometimes ascending the loftiest trees, more frequently humble” (Sk. ii. 687) and Darby said “sometimes not climbing”. As to the fruit, Mohr (Pl. Life Alab. 6: 3), pays it the compliment which he accords no other species of Alabama: “Important as a table and wine grape” and, after speaking of the “Berries large, plum-purple”, he adds: “Plants of spontaneous growth have been observed near Mobile bearing light amber-colored berries.”

Bartram’s party, crossing northern Florida en route to Mobile, where “Our road now for several miles led us near the Alabama”, eventually left “the Alabama bearing away Southerly, and enter[ed] a vast open forest which continued above seventy miles, East and West, without any considerable variation . . . . During our progress over this vast high forest, we crossed extensive open plains, the soil gravelly, producing a few trees and
shrubs or undergrowth, which were entangled with Grape vines (Vitis campestris) of a peculiar species [Vitis rotundifolia Michx. is so "peculiar" in many characters that Small makes it a separate genus, Muscadina], the bunches (racemes) of fruit were very large, as were the grapes that composed them, though yet green and not fully grown, but when ripe are of various colours, and their juice sweet and rich. The Indians gather great quantities of them, which they prepare for keeping, by first sweating them on hurdles over a gentle fire, and afterwards dry them on their bunches in the sun and air, and store them up for provisions: these Grape vines do not climb into high trees, but creep along from one low shrub to another, extending their branches to a great distance horizontally round about [Bailey, Gent. Herb. iii. 238, says of V. rotundifolia "climbing to 100 feet over bushes and trees"], and it is very pleasing to behold the clusters pendant from the vines, almost touching the earth, indeed some of them lie upon the ground." I have many times gathered from near the ground or from the surface of sand-hills or dunes and eaten more than my fill of the "very large . . . grapes [Michaux described his V. rotundifolia baccis magnis"], . . . their juice sweet and rich" of V. rotundifolia. Not only did the Indians of northwestern Florida and of Alabama gather and dry the large and sweet grapes "and store them up for provisions." Their successors in occupation of the region continue the custom, with obvious refinements. In his Nature's Garden for Victory and Peace, revised (Bull. Tuskegee Inst. Alab. no. 42), the late Dr. George W. Carver, ignoring the other 5 (and sour-fruited) species of Vitis, concentrated on the Muscadine, giving explicit directions for cleaning and preparing the fruits, after which "They may be dried whole or made into a leather . . . I much prefer the leather . . . of a fine flavor . . . I wish every housewife would try this." To those who intimately know the Muscadine and the Skupper-nong, their growth-habit and fruit there can be no serious question that V. campestris Bartr. (1791) is the same as V. rotundifolia Michx. (1803). The change of name would have been made a half-century ago if Bartram's species had not been ignored by the editors of Index Kewensis.

Rafinesque certainly had the plant of fresh to brackish tidal shores of Virginia to Florida (once in the Hackensack marshes of New Jersey) which Britton described as *Ammannia Koehnei*. Rafinesque’s description was good:

296, *Am. teres* Raf. caule teres vix ramoso obl. obt. carnosis, caulinis basi cord. ad medio. angustatis, rameis cuneatis brevis, fl. sepe solit—Virg. ad Carol. pedal, leaves twice as broad as in last, broader at both ends.

This necessitates the new combination:


The “last”, referred to above by Rafinesque, was his *Ammannia multicaulis*, l. c. (1840). This was evidently *Rotala ramosior* (L.) Koehne, with the virgate stems simple, “fol. linearib., acutis, fl. sepe vertic—Virginia, pedal, leaves uncial”, while no. 294, *A. linearifolia*, cited as the same as *A. ramosa* of authors, but with “fol. linearib. obt. nonnulis basi dilatatis” was *Rotala ramosior*, var. *interior* Fern. & Grisc.

*A. longifolia* Raf. l. c. (1840) from its excellent description and the region, “Arkansas and Louisiana,” was *A. coccinea* Rottb. (1773); and *A. diffusa* Raf. l. c. (1840) is apparently *A. auriculata* Willd. (1806).

None of these species of Rafinesque are recorded in Index Kewensis.

**Heracleum maximum** Bartr. Trav. 344 (1791). *H. lanatum* Michx. Fl. Bor.-Am. i. 166 (1803).

It is with real sadness that I seem forced to relinquish so long established and familiar a name as *Heracleum lanatum* Michx. But the species, which in the East extends south along the mountains to Georgia (Small), was detected by Bartram in the mountains of northwestern Georgia and briefly but passably described: “I observed growing in great abundance in these mountain meadows, Sanguisorba Canadensis and Heracleum maximum, the latter exhibiting a fine shew, being rendered conspicuous even at a great distance, by its great height and spread, vast pinnatifid leaves and expansive umbels of snow-white flowers.” We are sorry to give up the long established name; we should have been familiar with Bartram’s earlier one had it been picked up, as were several names in the same book,¹ in

¹ Such names as *Anona pygmaea*, basonym of *Asimina pygmaea* (Bartr.) Gray; *Andromeda formosissima*, *Sievertia montana*, etc
Index Kewensis. Incidentally, the type of *Heracleum lanatum* consists of a portion of leaf of the *Heracleum* and a fruiting umbel of *Pastinaca sativa!*

**The Plants passing as Phacelia hirsuta (Plates 814–816).**

Phacelia *fallax*, sp. nov. (tab. 814), a *P. hirsuta* differt foliorum caulinius lobis terminalibus cuneato-ovatis segmentis oblongo-ovatis; caulibus pedicellisque minutissime pilosis strigosisque; sepalis adscendentibus deinde tuberculato-ciliatis extus glabris vel glabratis intus glabris; seminibus transverse lineato-rugosis.—Mountain-region, western Virginia to Georgia. **Virginia:** Giles County, May, 1869, Canby. **Georgia:** Stone Mountain, May, 1869, Canby, May 13, 1897, Biltmore Herb., no. 4263, May 3, 1899, Canby & Sargent, May 24, 1899, near summit, A. H. Curtiss, no. 6458 (type in Herb. Gray.), April 16, 1932, thin soil on slope, E. J. Palmer, no. 39,909; slope of Pine Mountain, 1 mile north of Lithonia, April 28, 1934, Perry & Myers, no. 998.

Phacelia *fallax* has been mistaken for *P. hirsuta* Nutt. in Trans. Am. Phil. Soc. v. 191 (1837), our plate 815, figs. 1–3; and Brand in Engler, Pflanzenr. iv 251. 65 (1913) gave under the name *P. hirsuta* a description of *P. fallax*, based exclusively on the plant of Stone Mountain (the Biltmore and the Curtiss exsiccatae), Brand specially emphasizing the tuberculate-based cilia of the sepals and the broad lobing of the leaves and saying: “Von anderern Standorten nicht gesehen. Gray gibt die Pflanze ferner an für Missouri bis O st t e x a s.” The latter, the region from which Brand saw no material, is the real area of *P. hirsuta* Nutt. Nuttall’s species is definitely *hirsute*; the type or isotype (plate 815, fig. 1) in the Gray Herbarium closely matches the original description of the species which came from “sylvan prairies” in Arkansas, in having the summit of the stem and the pedicels spreading-hirsute, the “pectinately-pinnatifid” leaves with linear segments, and the sepals during anthesis widely spreading. It is matched by a few collections from Arkansas, Oklahoma and eastern Texas; and Mr. Long sends me for checking a characteristic specimen, collected as an adventive, near Telford, Pennsylvania, June 14, 1901 by Dr. C. D. Fretz. The contrasts between the two species are given below and in plates 814 and 815.
P. hirsuta: principal cauline leaves deeply or pectinately pinnatifid, with linear to linear-lanceolate segments; summit of stem and pedicels spreading-hirsute as well as pilose; sepals during anthesis widely spreading to slightly reflexed, later ascending, their margins ciliate-hirsute with mostly slender-based hairs, the upper surfaces strigose. Plate 815, Figs. 1–3.

P. fallax: principal cauline leaves with terminal cuneate-ovovate lobe rarely cleft to the middle, the broader segments oblong to oblong-ovovate; stem and pedicels minutely pilose, sometimes also strigose; sepals in anthesis appressed-ascending, their margins when mature ciliate with tuberculate- or pustular-based hairs, their upper surfaces glabrous. Plate 814.

The habitat of Phacelia fallax is rarely given on the labels before me. Such as indicate it say thin soil or mountain-slopes (in Georgia on granitic rock). Small, familiar with P. fallax, rather than P. hirsuta, says “Dry soil, rocks and open woods”; and McVaugh1, who, like Brand, defines as the western P. hirsuta Nutt. the plant of Stone Mountain and vicinity with hairs of the sepals “often enlarged at base and terminating in raised pustules or teeth on the sepals,” cites it for Georgia as a secondary member of the flora of the granite flat-rocks. Its habitat in Giles County, Virginia, is not recorded but since McVaugh’s map (his fig. 1) of granitic outcrops of the eastern United States, showing them to extend northward across Virginia, indicates none of them in or very near Giles County, it is safe to say that there it was not found on granite. The localities in Georgia are, quite clearly, thin and subarid acid soil.

The locality for Phacelia fallax in Giles County, Virginia, cited by Gray, Syn. Fl. iii. 164 (1878), by Brand, l. c. (1913) and the basis for the inclusion of Virginia in the range of the composite P. hirsuta in Gray’s Manual and in Small’s Manual, if taken into account by McVaugh, would have changed the tiny ellipse in northern Georgia (on his fig. 29) to an elongate tongue reaching western Virginia.

The habitats of true southwestern P. hirsuta (Arkansas, Oklahoma and Texas), on the other hand, are given as follows on the labels in the Gray Herbarium and in the Bebb Herbarium of the University of Oklahoma, the latter material kindly sent me for examination by Dr. Milton Hopkins, in addition to Nuttall’s “sylvan prairies”: wet prairie, Arkansas, Bush, no. 258; field,

Ark., F. L. Harvey, no. 12; limestone, hillside, Ark., Damaree, no. 14830; wet places, Oklahoma, McClary, May, 1935; meadow soil, Okla., DeVitt and Clark, no. 50; prairies, Okla., Robert Bebb, no. 3856 and Demaree, no. 12,646; on slough, Okla., Richard F. Mason, no. 127; shaded bank of slough, Okla., R. F. Mason, April 14, 1937; creek-banks and open woods, Okla., Houghton as Stevens, no. 2137; dense shrubbery along small stream, Okla., E. L. Little, Jr., no. 128; wooded grassy glade in river-valley, Okla., Hopkins, no. 2943; wooded hills, Okla., Goodman, no. 2137; granite hills, Okla., P. B. Sears, no. 1317; dry sandstone ledges and boulders in oak-hickory forest, Okla., Hopkins and Cross, no. 1487; sandy soil, Okla., V. Johnson, no. 116; arid hillside, Okla., M. Fielder, April 20, 1927. The southwestern P. hirsuta, then, is evidently more calcicolous and less xerophytic than the southeastern P. fallax.

The Missouri dots for Phacelia hirsuta on McVaugh’s map (his fig. 29) were presumably based on material of P. gilioides A. Brand (our plate 815, figs. 4–6). At least, all the Missouri specimens in the Gray Herbarium which were sent out as P. hirsuta are P. gilioides, a grayish or canescent plant with leaves cut into linear or linear-lanceolate segments, the stem and pedicels canescent-pilose without hirsute pubescence, the appressed calyx strigose, the corolla relatively small, its lobes undulate to dentate. It is P. GILIOIDES (misidentified as P. hirsuta) which Palmer & Steyermark assign in Missouri to “Rocky prairie, glades, ledges along bluffs, low rich woods, and alluvial ground along streams. Calciphile to circumneutral.” The Oklahoma material in the Bebb Herbarium and the Gray Herbarium shows the following habitats: creek-bank, Stevens, no. 1377; prairies, Robert Bebb, nos. 3850 and 5090, Ezra Brainerd, April 12, 1908; prairies and wood-openings, Robert Bebb, no. 3884; woods, Mrs. W. L. Ducker, no. 39; shale, rocky mountain, April 6, 1941, H. Randel Griffith; rocky hills, Robert Bebb, no. 2720 and May, 1935, J. E. McClary; vacant lots and waste lands, Aωal H. Brown, no. 18; cottonfield, April 19, 1927, R. E. Jeffs. Like P. hirsuta, it is also calcicolous and scarcely a xerophyte.

In Phacelia dubia1 (plate 816) the sepals are unequal, the
outer ones usually broader and longer than the others. As the plant occurs through southeastern Virginia, the region best known to Clayton, thence northward into Pennsylvania, southward to southeastern North Carolina and west to the Blue Ridge and less frequently to Ohio, West Virginia and Tennessee its outer sepals are lanceolate to lance-oblong or -linear (figs. 1 and 2), sometimes slightly spatulate, the inner ones from lanceolate to linear. In mature fruit the lower and middle calices of each raceme are 4.5–7.5 mm. long and nearly to quite twice as long as the capsule; and the lower mature pedicels are 5–25 mm. long. About Nashville, Tennessee, and in Alleghany County, Virginia, there occurs an extreme (fig. 4) of the species with the outer sepals ovate, the fruiting calyx only 4–5 mm. long, and the longer (lower) pedicels only 3–7 mm. long. Although small, it is not P. dubia, var. georgiana McVaugh, l. e. 158 (1943). That has narrow sepals and pinnate or deeply pinnatifid leaves, while the plant of Alleghany County and of the Nashville region has them shallowly lobed as in P. dubia, var. dubia McVaugh. I am calling the new plant

P. DUBIA (L.) Trel., var. interior, var. nov. (tab. 816, fig. 4), calycibus maturis 4–5 mm. longis; sepalis exterioribus ovatis; pedicellis imis maturis 3–7 mm. longis.—Western Virginia and north-central Tennessee. VIRGINIA: dry roadside, Covington, Alleghany County, May 12, 1916, Hunnewell, no. 4080. Ten-
as follows: Phacelia "dubia (L.), (P. parviflora, Pursh); Harvey." That was all. Disregarding the somewhat unusual punctuation and the fact that Phacelia dubia is unknown from so far west as Arkansas, Harvey’s material being P. hirsuta Nuttall from near its type-locality, we have the fact that Trelissace did not take the trouble to cite the basionym of P. dubia, which was Polemonium dubium L. Sp. Pl. 163 (1753)—a photograph of the type before me. The combination Phacelia dubia (L.) Small in Bull. Torr. Bot. Cl. xx. 303 (1894) was properly made, with correct citation of the basionym. Personally I should choose to cite Small as the correct author of the combination but I am assured that in doing so I should be too "literal". The easy-going nature by which many slipshod combinations by Britton, Stern and Poggenberg, by Small (elsewhere) and by some in recent years, have been accepted as "validated" by the next author who correctly made them with proper bibliographic citations cannot strongly appeal to those who look upon nomenclature as a necessary implement of careful taxonomic work. When a combination is carelessly made and used for a species to which the unstated or loosely assumed basionym does not belong the errors become doubled. I have more than once protested the practice of taking up such combinations as validly published. The difficulty, of course, is that thousands and thousands of regularly used combinations of the earlier botanists were thus published. When we can again have International Congresses it may be a safeguard against such opportunist and inconsiderate publication to establish a dead-line after which no such combinations will be valid. If I am here I will work for such legislation! Since the adoption of the more recently clarified rules of botanical nomenclature there is no excuse for slipshod bibliography.
NESSEE: gregarious in open shrubberies and pastures or in open grounds, Nashville, April, 1878, Gattinger (type in Herb. Gray.); barrens near Nashville, April, Gattinger as Curtiss, no. 2131.

One of Gattinger's specimens was called Phacelia pusilla Buckley in Am. Journ. Sci. xlv. 172 (1843). Buckley's species has generally been considered identical with P. dubia, but it came from Alabama and had the "sepals linear-oblong, acute", which certainly is not the case with var. interior. I have not seen Buckley's type but his description of the Alabama plant, with the pinnatifid leaves with obovate and abruptly acuminate segments and with linear-oblong, acute sepals 2/3 the length of the corolla, might well have been drawn from Harper, no. 82, from Elmore County, which is one of the paratype-collections of P. dubia, var. georgiana McVaugh. Some specimens, like one from Nashville, April, 1884, Miss Cushman, and Biltmore, North Carolina, Biltm. Herb. no. 786b, are transitional between var. dubia and var. interior.

In Phacelia dubia the seed (fig. 3) is rugose- reticulate, in P. fallax (plate 814, fig. 4) transversely lineate- rugose.

Although McVaugh delimits his tabulation of plants occurring on granite flat-rock at the North Carolina-Virginia boundary,¹ his maps of ranges often extend farther north. In view of the abundance of Phacelia dubia on the Coastal Plain of Virginia (in Henrico, Prince George, Sussex, Southampton and Greensville Counties, and presumably the type-locality of Clayton) and McVaugh's correct reference to it on his p. 158 as "abundant in many parts of Virginia", it is difficult to interpret his map of the range of P. dubia which shows only 3 or 4 stations in the state, these all on the granites of the northwestern section of the state. The inclusion of the many stations 100-135 miles to the southeast would make a somewhat different picture, as would the inclusion of Newbern at the mouth of the Neuse in Craven County—see Rhodora, xlii. 383 and 404 (1940). "The longleaf pine (Pinus palustris Mill.) apparently does not occur on any of the actual outcrops, but is common in Heard County, Georgia, in the vicinity of the flat-rocks", etc. At its northern limit it is primarily a species of Coastal Plain sands but nearly 50 miles to the westward it has a small outlying colony on a low granite hill at the outer edge of the Piedmont in Brunswick County.—see Rhodora, xlv. 374-376 (1943).

¹ Near the fall-line in southeastern Virginia there are two stations of special interest in connection with McVaugh's study of the flora of the granite flat-rocks farther south. Cheiranthes lanosa, which "is approaching here the eastern edge of its range" on the flat-rocks of central Georgia (long. about 82° W.), comes down to flat-topped granite rock at the fall-line in western Sussex County, Virginia, long. about 77° 35' W.—see Rhodora, xlii. 383 and 404 (1940). "The longleaf pine (Pinus palustris Mill.) apparently does not occur on any of the actual outcrops, but is common in Heard County, Georgia, in the vicinity of the flat-rocks", etc. At its northern limit it is primarily a species of Coastal Plain sands but nearly 50 miles to the westward it has a small outlying colony on a low granite hill at the outer edge of the Piedmont in Brunswick County.—see Rhodora, xlv. 374-376 (1943).
County, North Carolina (specimen from M. A. Curtis) and of Wilmington at the mouth of Cape Fear River in southeastern North Carolina (see Wilmington Flora by Thos. F. Wood and Gerald McCarthy in Journ. Elisha Mitch. Sci. Soc. for 1885–’86, p. 131, as P. parviflora Pursh). In fact, M. A. Curtis, who intimately knew North Carolina, did not restrict P. dubia (or parviflora) to the 2 stations on the granitic belt of western North Carolina. By him it was not known from the mountains but was thought to be characteristic of the “Low Distr.”, i. e. the Coastal Plain (see M. A. Curtis, Geol. and Nat. Hist. Surv. N. C., Pt. III. Botany, 42 (1867)).

Plate 814 is of Phacelia fallax, all figs. from the type: fig. 1, portions of plant, × 1; fig. 2, young inflorescence, × 3; fig. 3, portion of mature calyx, × 10; fig. 4, seed, × 10.

In plate 815, figs. 1–3 are of Phacelia hisbuta: fig. 1, type or isotype, × 1; fig. 2, portion of inflorescence, × 3, from northwestern Arkansas, F. L. Harvey, no. 12; fig. 3, seed, × 10, from Prescott, Arkansas, Bush, no. 258.

Figs. 4–6, P. gilioides: fig. 4, plant, × 1, from Joplin, Missouri, E. J. Palmer, no. 1879 A (as P. dubia); fig. 5, young inflorescence, × 3, from same no.; fig. 6, seed, × 10, from near Muskogee, Oklahoma, Robt. Bebb, no. 3850.

In plate 816, figs. 1–3 are of typical Phacelia dubia: fig. 1, young inflorescence, × 3, from below Emporia, Virginia, Fernald & Lewis, no. 14,541; fig. 2, portion of mature inflorescence, × 3, from near Burgess Station, Virginia, Fernald & Long, no. 10,015; fig. 3, seed, × 10, from no. 10,015.


Rafinesque got hold of material without axillary spines, which is not unusual, both this glabrous species of the Interior and Southwest and the pubescent H. quadrivalvis Walt. having spines or not, the character variable. Likewise, the glabrous species may have solitary or glomerulate flowers. Rafinesque’s description is unequivocal:

273, Hydr. uniflora Raf. caule flexuoso inerme glabro, fol. alt. lanceol. acutis subsessil. pedunc. axil. unifl. bract. 2 obl. ineq. cal. lin. glbris—Louisiana on Red River, sent me by Torrey as Hydr. 4valvis, but unlike the last, smooth, not spinose, leaves smaller, biuncial, flowers bluish white, anthers blue shaped like z, caps. bivalve


There can be no doubt that Rafinesque had the plant known for three fourths of a century as Lycopus sessilifolius. His description is beyond dispute, for he restricted the genus to species with acerosc teeth:
834, Lyc. amplectens Raf. glaber, caulib. virgatis simpl. angulis obt. fol. arcte sessil. subamplex. basi dilatatis oblongis acum. remote serratis, axilis nudis paucifl.—Alabama, pedal sesquipedal leaves uncial pale beneath, this sp. differs from all by obtuse angles and leaves not attenuate at base.
Panicum benneri: figs. 1 and 2, × 1; fig. 3, × 3; figs. 4 and 5, × 10; all from type.
Yucca Filamentosa: Fig. 1, flowers, × 1, from type; Fig. 2, leaves, × ½; Figs. 3 and 4, flowers, × 1; Fig. 5, ovary, style and filaments, × 5; Fig. 6, capsules, × 1.
Yucca Smalliana: FIG. 1, leaves and flowers, $\times 1/2$, from type; FIG. 2, basal rosette, greatly reduced; FIGS. 3 and 4, flowers, $\times 1$, from type; FIG. 5, ovary, style and filaments, $\times 3$; FIG. 6, capsule, $\times 1$


**Trillium Catesbaei:** fig. 1, type, $\times 1$, after photograph by C. A. and Una F. Weatherby.

**Trillium nervosum:** fig. 2, type-sheet, $\times \frac{1}{2}$, after photograph by C. A. and Una F. Weatherby.

fig. 3, detail, to show style, $\times 3$
Trillium nervosum: figs. 1 and 2, portions, × 1, of Catesby's plate of Solanum triphyllum; flore hexapelato carneo
Smilax Bona-nox, var. exauriculata: fig. 3, leaf, × 1, from type
Smilax Pseudo-China: fig. 1, syntype, after photograph sent by Dr. John Ramsbottom; fig. 2, type, after photograph sent from Linnean Society of London; both reduced; 1 leaf × 1
Cytilla racemiflora: fig. 3, fruit, × 5
Var. subglobosa: fig. 1, portion of fruiting branch, × 1; fig. 2, fruit, × 5; both from type

Photo, B. G. Schubert.
Phacelia fallax, all figs. from type: fig. 1, portions of plant, × 1; fig. 2, young inflorescence, × 3; fig. 3, portion of mature calyx, × 10; fig. 4, seed, × 10
Phacelia hirsuta: fig. 1, type or isotype, × 1; fig. 2, portion of inflorescence, × 3; fig. 3, seed, × 10
P. giloides: fig. 4, plant, × 1; fig. 5, young inflorescence, × 3; fig. 6, seed, × 10

Photo. B. G. Schubert.
Phacelia dubia: fig. 1, young inflorescence, × 3; fig. 2, portion of mature inflorescence, × 3; fig. 3, seed, × 10
Var. interior: fig. 4, portion of mature inflorescence, × 3, from type

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