

NEW OR OTHERWISE NOTEWORTHY APOCYNACEAE OF TROPICAL AMERICA. IV¹

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Temnadenia stenantha Woodson, sp. nov., fruticosa volubilis altitudine ignota; ramulis crassiusculis juventate minute ferrugineo-tomentulosis maturitate glabratis et inconspicue lenticellatis; foliis oppositis longe petiolatis oblongo-ellipticis apice breviter acuminatis basi late obtusis 11–13 cm. longis 4.5–5.0 cm. latis rigide membranaceis subcoriaceisve supra glabris subtus basi inconspicue minuteque puberulis caeterumque glabris; petiolis 1.7–1.9 cm. longis minute ferrugineo-puberulis; inflorescentiis lateralibus alternatis trichotome bostrycino-racemosis foliis paulo brevioribus vel subaequantibus floras 20–25 mediocres fulvas gerentibus; pedunculo di-trichotomo minute irregulariterque ferrugineo-tomentuloso; pedicellis 1.0–1.25 cm. longis post maturitatem paulo accrescentibus minute ferrugineo-puberulis; bracteis minute lanceolatis acuminatis 0.1–0.3 cm. longis paululo foliaceis; calycis laciniis ovato-lanceolatis acutis acuminatisve prope basem connatis 0.35–0.525 cm. longis plus minusve foliaceis extus minute ferrugineque puberulo-papillatis intus glabris squamellam obscure bifidem basi gerentibus; corollae salverformis tubo 2.5–2.7 cm. longo basi ca. 0.2–0.25 cm. diametro metiente prope apicem paululo gradatim dilatato extus minute ferrugineque puberulo-papillato intus prope insertionem staminum minute villosulo caeterumque glabro lobis oblique obovato-oblongis rotundatis ascendentibus 1.0–1.1 cm. longis; antheris omnino inclusis elliptico-sagittatis acuminatis auriculis angustissimis 0.7–0.75 cm. longis dorso dense villosulobarbatis; ovario oblongoideo apocarpio ca. 0.15 cm. longo omnino glaberrimo; stigmate fusiformi-subcapitato apice obscure obtuseque bipartito ca. 0.15 cm. longo; nectariis com-

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presse oblongoideis ovarium paululo superantibus haud connatis; folliculis ignotis.—COLOMBIA: BOYACA: on edge of high forest, region of Mt. Chapon, alt. 7000 ft., June 17, 1932, *A. E. Lawrance 241* (Herb. New York Bot. Garden, TYPE, Herb. Missouri Bot. Garden, photograph and analytical drawings).

At first sight this plant was mistaken for a species of *Laubertia*, which it simulates superficially, particularly with regard to the mode of inflorescence, the shape of the corolla, and the minute ferruginous indument. The floral characters indicate an alliance with the technical requirements of *Temnadenia* which it is impossible to disregard.

Mr. Lawrance observes that this species is rare where found, in the mountainous region of extreme western Boyaca, at a distance of about one hundred miles northwest of Bogota. The flowers are reported as "bright yellow" and without odor. The vine is described by Lawrance as creeping upon the ground.

Macropharynx anomala Woodson, sp. nov., fruticosa vultibilis altitudine ignota; ramulis crassiusculis minute denseque ferrugineo-tomentulosis tandem glabratibus; foliis oppositis petiolatis late ovatis apice anguste breviterque subcaudato-acuminatis basi late obtusis vel rotundatis saepe subcordatis 10–18 cm. longis 5–9 cm. latis membranaceis supra irregulariter ferrugineque puberulo-papillatis subtus dense minutissimeque ferrugineo-tomentulosis; petiolis 2.5–3.0 cm. longis minute ferrugineo-tomentulosis; inflorescentiis lateralibus oppositis subumbellato-fasciculatis e cyma bostrycina 3-chotoma aperte derivatis paucifloris; pedunculis 1.0–2.5 cm. longis minute ferrugineo-tomentulosis pluribracteatis; bracteis linearibus 1.0–1.4 cm. longis minute pilosulis puberulo-papillatisve; pedicellis 0.15–0.23 cm. longis ut in pedunculo vestitis; calycis laciniis anguste elliptico-lanceolatis acuminatis 1.7–1.8 cm. longis foliaceis minutissime puberulo-papillatis intus basi squamellam deltoideam minute denticulatam gerentibus; corollae salverformis colore ignotae tubo (in alabastro) 1.4–1.6 cm. longo basi ca. 0.25 cm. diametro metiente prope insertionem staminum paulo inflato deinde prope orificem gradatim angustato extus intusque minute puberulo-

papillato lobis anguste ovato-dolabriformibus acuminatis 0.9–1.0 cm. longis; staminibus prope basem corollae insertis; antheris anguste sagittatis auriculis breviusculis acuminatis 0.7–0.72 cm. longis dorso minutissime papillatis glabratissive; ovario oblongoideo ca. 0.15 cm. longo glabro; stigmate subcapitato 0.15 cm. longo; nectariis compresse ovoideo-oblongoideis ovarium paulo superantibus; folliculis ignotis.—ECUADOR: in silv. tropic. fl. Pilaton, Oct., 1902, *A. Sodiro 107/16* (Herb. Berol., TYPE, Herb. Missouri Bot. Garden, photograph and analytical drawings).

The relegation of this species to *Macropharynx* is not completely without question. In aspect and position of the inflorescence, the single specimen resembles *Macropharynx spectabilis* (Stadelm.) Woodson, of which it is viewed tentatively as a congener. On the other hand, the inflorescences of *M. anomala* appear to have been derived from di- or trichotomous bostrychoid racemes such as occur in the typical species of *Temnadenia* having undergone great reduction. The pentamerous calyx and non-bracteate pedicels present arguments against the inclusion of the species within the monotypic *Macropharynx*.

Echites turbinata Woodson, sp. nov., fruticosa volubilis altitudine ignota; ramulis crassiusculis glabris maturitate conspicue lenticellatis; foliis oppositis petiolatis ellipticis apice acuminatis basi late obtusis 7.5–12.0 cm. longis 3.5–7.0 cm. latis firme membranaceis aperte paulo subsucculentis pallide viridibus omnino glabris; petiolis 0.8–1.3 cm. longis; stipulis intrapetiolaribus deltoideis subintegris; inflorescentiis lateralibus alternatis folia subaequantibus floras mediocres 8–10 gerentibus; pedunculo glabro; pedicellis 0.8–1.0 cm. longis glabris; bracteis ovato-lanceolatis 0.15–0.3 cm. longis; calycis laciniis ovatis longe acuminatis 0.3–0.32 cm. longis paulo foliaceis glabris intus basi squamellam deltoideam minutissime denticulatam gerentibus; corollae salverformis (colore ut creditur aut albidæ aut gilvæ) tubo 0.7 cm. longo basi ca. 0.15 cm. diametro metiente prope orificem paulo angustato extus intusque minute puberulo-papillato lobis anguste elliptico-

lanceolatis acuminatis 1.4–1.6 cm. longis turbinatis; antheris paululo exsertis anguste sagittatis 0.45 cm. longis glabris; stigmatibus fusiformi-subcapitato; ovario ovoideo minutissime pilosulo-papillato ca. 0.15 cm. longo; nectariis compresse oblongoideis ovario paulo brevioribus prope apicem inconspicue pilosulis; folliculis ignotis.—COSTA RICA: forets du Rancho Flores, Febr. 22, 1890, *A. Tonduz 2147* (Herb. Berol., TYPE, Herb. Missouri Bot. Garden, photograph and analytical drawings).

This species is most closely related to *E. Tuxtlensis* Standl., as is evidenced by the dichasial inflorescence, narrow corolla-lobes, and general aspect of the subsucculent foliage. The latter species differs, however, in the smaller corolla and leaves, and in the more ramified, more diffuse inflorescence with more slender branches. The type specimen of *E. turbinata* is of interest morphologically, since it indicates a transition from trichasial to dichasial mode of inflorescence in the upper branches. The same species is apparently represented by *Ørsted 15544* "in Monte Barba," Costa Rica, in the herbarium at Copenhagen.

Echites cincinnalis Woodson, sp. nov., suffruticosa volubilis altitudine ignota; ramulis graciliusculis minutissime sparsissimeque pilosulis; foliis oppositis breviter petiolatis ovato-ellipticis apice breviter acuminatis basi obscure cordatis vel latissime obtusis 4.5–8.0 cm. longis 2.0–4.5 cm. latis membranaceis utrinque glabris opacis dilute viridibus; petiolis 1.0–1.5 cm. longis; stipulis intrapetiolaribus haud visis; inflorescentiis lateralibus alternatis cincinnalibus simplicibus floras speciosas 8–14 gerentibus; pedunculo folios subaequante ut in ramulo vestito; pedicellis 0.8–0.9 cm. longis minutissime pilosulis; bracteis minute lanceolatis ca. 0.1 cm. longis caducis; calycis laciniis anguste lanceolatis paululo foliaceis 0.3–0.35 cm. longis acuminatis minute sparseque pilosulis intus basi squamellam deltoideo-ligulatam subintegram gerentibus; corollae salverformis tubo 3.5–3.75 cm. longo basi ca. 0.15 cm. diametro metiente usque $\frac{1}{3}$ altitudinem angustato deinde abrupte dilatato ibique staminigero deinde prope fauces gradatim

angustato non contorto lobis oblique obovatis 1.8–2.0 cm. longis patulis margine sparse pilosulo-ciliatis; antheris ovato-lanceolatis acuminatis 0.75 cm. longis glabris omnino inclusis; stigmatibus fusiformi-subcapitato ca. 0.175 cm. longo; ovario oblongoideo ca. 0.15 cm. longo glabro; nectariis compressis obovoideis apice paululo emarginatis plus minusve connatis ovario ca. dimidio brevioribus; folliculis ignotis.—NICARAGUA: GRANADA: environs de Granada, alt. 40 m., autumn, 1869, *P. Lévy 1074* (Herb. Copenhagen, TYPE, Herb. Missouri Bot. Garden, photograph and analytical drawings).

This species is unique in the genus *Echites* because of its simple, cincinnal inflorescence, resembling that of the genus *Fernaldia*, and its inconspicuous indument. Its closest known relatives are apparently *E. turrigera* Woods., *E. elegantula* Woods., and *E. yucatanensis* Millsp.

Cufodontia arborea Woodson, sp. nov., arbor magna altitudine ignota; ramulis teretibus juventate plus minusve puberulis mox glabratis conspicue lenticellatis rimosis; foliis alternatis petiolatis late oblongo-ellipticis apice obtusis vel late acutis basi late obtusis 8.0–12.5 cm. longis 2.5–4.5 cm. latis subcoriaceis omnino glabris supra nitidulis subtus opacis venis secundariis subhorizontalibus utroque latere ca. 15–18; petiolis 1.0–1.2 cm. longis canaliculatis juventate ut in ramulo vestitis mox glabratis; cymis extra-axillaribus alternatis 7–9-floris dichotome divisis; pedunculo petiolos subaequante minute puberulo; pedicellis 0.35–0.4 cm. longis minute puberulis; tubo calycis cylindrico prope orificem paululo dilatato 0.6 cm. longo obtuse breviterque 2-labiato extus minute puberulo-papillato laciniis interioribus ovato-reniformibus obtusis apice minutissime acuminatis ciliatis; corollae dilute fulvae tubo cylindrico ca. 0.6–0.625 cm. longo basi ca. 0.175 cm. diametro metiente extus prope orificem puberulo-papillato intus villosulo lobis oblique oblongo-ellipticis acutis 0.9–0.95 cm. longis prope basem minute villosulis patulis; staminibus prope medium tubi corollae insertis filamentis ca. 0.05 cm. longis antheris ovoideis acuminatis ca. 0.15 cm. longis glabris omnino inclusis; ovariiis ovoideis apocarpis ca. 0.1 cm. longis glabris; stylo ca. 0.2–0.225

cm. longo; stigmatе cylindrico-subcapitato ca. 0.05 cm. longo; fructibus desiderantibus.—MEXICO: OAXACA: vicinity of Cafetal Concordia, alt. 400–650 m., April 1–15, 1933, *C. V. Morton & E. Makrinius 2692* (U. S. Nat. Herb., TYPE, photograph and analytical drawings, Herb. Missouri Bot. Garden).

The status of this peculiar genus is somewhat enlightened by Mr. Morton's collecting notes, which describe the plant as a "large tree with milky sap; corolla pale yellow." The other species of *Cufodontia*, *C. Stegomeris* and *C. Lundelliana*, have been classified by the collectors of the type specimen of either as shrubs. From both, *C. arborea* differs in the larger leaves and corolla. The corolla is puberulent without as in *C. Stegomeris*. Fruit is unknown for all three species.

Forsteronia portoricensis Woodson, sp. nov., fruticosa volubilis; ramulis sat crassiusculis glaberrimis vel juventate minutissime papillatis maturitate inconspicue lenticellatis; foliis oppositis breviter petiolatis oblongo-ellipticis rariusve ovalibus apice abrupte brevissime acuminatis non raro aut acutis aut obtusis basi late obtusis 3.2–9.0 cm. longis 1.3–4.7 cm. latis coriaceis margine post exsiccationem paululo revolutis venis secundariis arcuatis sat sparsis glaberrimis supra nitidulis subtus pallidioribus; petiolis 0.4–0.6 cm. longis; inflorescentiis corymboso-paniculatis terminalibus folia subaequantibus vel plus minusve manifeste brevioribus floras multas parvas coccineas rariusve carneas gerentibus; pedunculo minute puberulo-papillato vel glabriusculo; pedicellis 0.2–0.3 cm. longis papillatis rariusve minute sparseque puberulo-papillatis; bracteis ovatis 0.1–0.25 cm. longis scariaceis; calycis laciniis ovatis acutis vel obtusis 0.18–0.3 cm. longis scariaceis extus papillatis glabriusculisve squamellis alternatis 2–4; corollae tubo 0.15–0.2 cm. longo basi ca. 0.12–0.15 cm. diametro metiente faucibus ca. 0.18–0.2 cm. diametro metientibus extus glabris intus glabris vel indistinctissime papillatis lobis oblongo-ligulatis obtusis 0.4–0.5 cm. longis patulis extus intusque glabris margine non raro minute sparseque ciliolatis; filamentis staminum 0.3–0.32 cm. longis stylo agglutinatis antheris 0.25–0.3 cm. longis omnino exsertis glabris; ovario apocarpio ovoideo

ca. 0.07 cm. longo minute puberulo non raro glabriusculo; stigmatate 0.1–0.13 cm. longo; stylo 0.25–0.3 cm. longo; nectariis ovarium subaequantibus; folliculis sat gracilibus flexuosis acuminatis reflexo-divaricatis plus minusve obfalcatis 14–19 cm. longis glabris; seminibus 0.9–1.0 cm. longis como dilute aurantiaco 1.8–2.0 cm. longo.—PORTO RICO: prope Humaco in fruticetis litoralibus ad “Candelero,” Sept. 29, 1886, *P. Sintenis* 5195 (Herb. Berol., TYPE, Herb. Missouri Bot. Garden, photograph and analytical drawings).

Apparently all specimens from Porto Rico previously determined as *F. corymbosa* (Jacq.) G. F. W. Meyer are referable to this species. *F. corymbosa*, *F. floribunda* (Sw.) G. F. W. Meyer, and *F. portoricensis* form a closely knit complex within the genus *Forsteronia*. Each is strictly endemic to a single island or island group of the Greater Antilles. A summary of the principal differences and similarities of the three species may conveniently be provided in parallel columns:

<i>F. corymbosa</i>	<i>F. portoricensis</i>	<i>F. floribunda</i>
<i>Leaves</i> obovate to broadly oval; <i>venation</i> broadly arcuate, relatively distant.	<i>Leaves</i> oblong-elliptic, rarely oval; <i>venation</i> broadly arcuate, relatively distant.	<i>Leaves</i> oblong-elliptic to oval; <i>venation</i> subhorizontal, dense.
<i>Corolla</i> deep red, rarely pale flesh-colored; <i>lobes</i> papillate within.	<i>Corolla</i> deep red; <i>lobes</i> glabrous within.	<i>Corolla</i> greenish-white; <i>lobes</i> glabrous within.
<i>Follicles</i> horizontal, stout, blunt, 11–14 cm. long.	<i>Follicles</i> reflexed-divaricate, more or less obfalcate, acuminate, 14–19 cm. long.	<i>Follicles</i> subparallel to tortuous or divaricate, flexuose, acuminate, 16–30 cm. long.
<i>Plants</i> of Cuba and Hispaniola.	<i>Plants</i> of Porto Rico.	<i>Plants</i> of Jamaica.

It is not always recognized by taxonomists that overlapping distinctions or criteria among species are biologically significant or worthy of note other than for the purposes of intended reduction to synonymy. The fact that related species are plexi of similar and dissimilar characters has consequently been

much neglected in the search for "diagnostic" characters for the bare purpose of easy identification. Therefore the position has been taken that, in spite of recognition that the characters enumerated above for *F. corymbosa*, *F. portoricensis*, and *F. floribunda* show a definite tendency of progression, or intergradation, from *F. corymbosa* to *F. floribunda*, or vice versa, through *F. portoricensis*, evidence is not thereby provided for the maintenance of one, rather than of three species. Nor does the existence of *F. portoricensis* impair the interpretation of *F. corymbosa* and *F. floribunda* as important biological entities. It may be argued with reason that geographical isolation has been responsible for the crystallization of the plexus into three closely related but patently distinct entities rather than into one rather loose and variable, larger group. Such is probably the case. At any event, is it not more than possible that the scrutiny of the relationships of such closely related botanical entities may contribute much to our understanding of the functions of organic evolution?

Forsteronia paludosa Woodson, sp. nov., suffruticosa volubilis; ramulis sat gracilibus glabris maturitate conspicue lenticellatis; foliis oppositis brevissime petiolatis anguste oblongo-lanceolatis breviter acuminatis vel acutis basi obtusis 5–7 cm. longis 1.3–1.6 cm. latis firmiter membranaceis vel subcoriaceis supra glabris nervo medio basi pauciglanduligero subtus in axillis nervi medii inconspicue barbellatis caeterumque glabris; petiolis 0.25–0.3 cm. longis glabris; inflorescentiis subspiciformi-paniculatis terminalibus folia subaequantibus floras plures parvas albidas gerentibus; pedunculo primario glabriusculo superne sparsissime irregulariterque pilosulo-papillato ultimo vix manifesto; pedicellis ca. 0.01–0.02 cm. longis minutissime puberulo-papillatis; bracteis minute ovatis 0.01–0.03 cm. longis scariaceis; calycis laciniis ovatis acutis 0.1–0.12 cm. longis minutissime puberulo-papillatis scariaceis eglanduligeris; corollae extus minutissime irregulariterque puberulo-papillatae tubo 0.1–0.12 cm. longo basi ca. 0.075 cm. diametro metiente faucibus ca. 0.125 cm. diametro metientibus intus minute villosulo lobis oblongis ca. 0.15 cm. longis intus

dense pilosulis patulis; filamentis staminalibus ca. 0.05 cm. longis distinctis stylo haud agglutinatis antheris subinclusis apice parum exsertis ca. 0.15 cm. longis minute barbellatis; ovario ovoideo apocarpo ca. 0.05 cm. longo minute papillato; stigmatibus ca. 0.12 cm. longo; nectariis ovario brevioribus; folliculis ignotis.—BRAZIL: PARA: locis paludosis, Campos de Cupijo, prope Cometa, July 22, 1916, *A. Ducke 21627* (Herb. Berol., TYPE, Herb. Missouri Bot. Garden, photograph and analytical drawings).

Well distinguished by its small, narrow foliage and subspiciform inflorescence. The eglandular calyx is a rarity in the genus.

Forsteronia simulans Woodson, sp. nov., fruticosa volubilis; ramulis sat crassiusculis glaberrimis maturitate inconspicue lenticellatis; foliis oppositis breviter petiolatis oblongo-ellipticis apice acutis basi obtusis vel plus minusve cuneatis 2–5 cm. longis 0.7–2.2 cm. latis coriaceis vel subcoriaceis omnino glaberrimis supra nervo medio pauciglandulifero subtus pallidioribus venis secundariis subhorizontalibus; petiolis 0.3–0.5 cm. longis; inflorescentiis dense corymboso-subumbellatis simplicibus (vel obscurissime compositis?) terminalibus folia subaequantibus floras numerosas virido-fulvidas gerentibus; pedunculo minute papillato; pedicellis 0.5–0.6 cm. longis minutissime papillatis; bracteis ovato-lanceolatis 0.15–0.3 cm. longis paululo foliaceis; calycis laciniis ovatis obtusis 0.15–0.2 cm. longis extus glabriusculis vel minutissime papillatis squamellis alternatis solitariis; corollae tubo ca. 0.25 cm. longo basi ca. 0.125 cm. diametro metiente faucibus ca. 0.15 cm. diametro metientibus extus glabro intus minute puberulo lobis ovatis obtusis ca. 0.2 cm. longis patulis extus intusque glabris margine minute sparseque ciliolatis; filamentis staminum ca. 0.15 cm. longis stylo agglutinatis antheris ca. 0.2 cm. longis omnino exsertis glabris; ovario apocarpo ovoideo ca. 0.06 cm. longo glabro; stigmatibus ca. 0.2 cm. longo; stylo ca. 0.2 cm. longo; nectariis ovarium subaequantibus; folliculis ignotis.—COLOMBIA: SANTANDER DEL NORTE: eastern slope of Paramo del Hatico, en route from Toledo to Pamplona, alt. 2300 m., edge

of woods, March 12, 1927, *E. P. Killip & A. C. Smith 20568* (U. S. Nat. Herb., TYPE, Herb. Missouri Bot. Garden, photograph and analytical drawings).

It is astonishing to find a plant as similar superficially as this plant is to *F. floribunda* of Jamaica, with as many striking morphological dissimilarities. The foliage of the two species appears strikingly similar with regard to general size and shape, texture, color, and venation. However, that of *F. simulans* is glandular at the base of the midrib, while that of *F. floribunda* is eglandular. The general aspect of the inflorescence of the species is also somewhat similar, and the color of the flowers is generally alike. But the inflorescence of *F. simulans* is evidently simple, or appears so upon dissection; that of *F. floribunda* is thyrseform. That the evidently simple inflorescence of the former represents a reduction from a previous compound state appears plausible. One of the most striking characteristics of *F. simulans*, however, is found in the stigma, which is virtually umbraculiform as in the genus *Mandevilla*, which it resembles in this character more nearly than the other species of *Forsteronia* with relatively simple, fusiform or subcapitate stigmata. The species, in short, appears to be of unusual phylogenetic interest.

Forsteronia Velloziana (A. DC.) Woodson, comb. nov.

Echites bracteata Vell. Fl. Flum. 112. 1830; Icon. 3: pl. 41. 1827, not HBK.

Echites Velloziana A. DC. in DC. Prodr. 8: 474. 1844.

Forsteronia multinervia A. DC. γ. *microphylla* Muell.-Arg. in Mart. Fl. Bras. 6¹: 105. 1860.

Forsteronia ? *bracteata* (Vell.) Muell.-Arg. loc. cit. 106. 1860.

Thyrsanthus bracteatus (Vell.) Miers, Apoc. So. Am. 102. 1878.

Forsteronia microphylla (Muell.-Arg.) Hand.-Mzt. Denkschr. Akad. Wiss. Wien 79: 388. 1931 (reprint, 12. 1910).

An unmistakable and rather frequently collected element of the southern Brazilian flora. There can be little question that this entity is entitled to full specific rank. Its brushy, sub-



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