WEST INDIAN VERNONIÆ

ACADEMICAL DISSERTATION

BY

E. L. EKMAN

UPPSALA 1914

ALMQVIST & WIKSELLS BOKTRYCKERI-A.-B.

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WITH 6 PLATES

By permission of the Philosophical Faculty of the University of Lund to be publicly defended in the Lecture Room of the Botanical Institution on March 2nd, 1914, at 10 o'clock a. m. for the degree of Doctor of Philosophy

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With 6 plates.

Communicated January 14th by G. LAGERHEIM and C. A. M. LINDMAN.

Introduction.

Six years ago, the author of this paper made a journey to South America in order to study its flora. In the Argentine Territorium of Misiones I had an opportunity to stay for several months, and I there brought together considerable collections of plants, the determination of which has been carried on at the Natural History Museum at Stockholm. I soon found that the determination of certain genera offered great difficulties. My attention was especially drawn to the classification of the Vernoniæ in the great Regnellian Herbarium at Stockholm, but I soon extended my studies to include all Brazilian Vernoniæ. Some taxonomic questions obliged me to examine the value of several West Indian species. While working with the Vernoniæ of the West Indies, I consulted, in the first place, an important paper entitled »A Revision of the North American Vernoniæ», having for its author Mr. HENRY ALLAN GLEASON from Chicago. At first sight, this work inspired confidence by the apparently practical and natural arrangement of the species, and by their accurate delimitation supported by geographical facts. But I soon was able to state that the author had not the right conception of the species of SWARTZ, the types of which are in the Stockholm

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Herbarium. At first, I intended to publish some corrective remarks to GLEASON's Revision, but I soon made up my mind to give a full account of all West Indian species of *Vernonia*, worked out upon a basis of type specimens available in European herbaria. In the course of my work I have been able, through the kindness of the curators of the Regnellian funds, to visit the following herbaria:

Berlin. The herbarium of the Königliches Museum contains the types of the species described by LESSING, WILLDENOW, and SPRENGEL, further, the rich collections of the KRUG-URBAN Herbarium, which through the courtesy of Prof. IGN. URBAN have been sent to me on loan, and are the main basis of my studies.

Brussels. The herbarium of the Jardin Botanique is of especial interest to students of the South American *Vernoniæ*, as it contains the types collected by MANSO, LINDBERG, and others.

Geneva. The Prodrômus Herbarium contains the types of DE CANDOLLE. In the DELESSERT Herbarium I have found duplicate specimens of the types of some French and Spanish botanists, viz. L. C. RICHARD and LA LLAVE et LEXARCA. The BOISSIER Herbarium contains a very good series of WRIGHT's Cuban plants.

London. The Kew Herbarium possesses the types of GARDNER.

Munich. Here the types of MARTIUS are kept, described in the Prodrômus by DE CANDOLLE.

Paris. The collections of the Muséum d'Histoire Naturelle are of the greatest importance, containing the types of LAMARCK, L. C. RICHARD, HUMBOLDT-BONPLAND-KUNTH, CASSINI, and others. The COSSON-DURAND Herbarium, which is kept apart, contains the types of SCHULTZ-BIPONTINUS.

I have, further, had on loan some material of *Vernonia* from the British Museum and the Museums of Copenhagen, Florence, Göttingen (of especial interest, containing the types of GRISEBACH), Lund, St. Petersburg, Upsala, and Vienna. I beg to render my sincerest thanks to the directors of all herbaria now mentioned.

When quoting the specimens, I have indicated, in parenthesis, in which herbarium they are to be found. The letters in parenthesis signify:

B	the Berlin Herbarium.
BB	the BOISSIER-BARBÉY Herbarium, Geneva.
Br	the Herbarium of British Museum.
Bss	the BOISSIER Herbarium, Geneva.
CD	the COSSON-DURAND Herbarium, Paris.
D	the DELESSERT Herbarium, Geneva.
DC	the DE CANDOLLE Herbarium, Geneva.
F	the Florence Herbarium.
G	the Göttingen Herbarium.
H	the Copenhagen Herbarium.
K	the Kew Herbarium, London.
KU	the KRUG-URBAN Herbarium, Berlin.
L	the Lund Herbarium.
M	the Munich Herbarium.
P	the Paris Herbarium.
Petr	the St. Petersburg Herbarium.
Prodr	the Prodrômus Herbarium, Geneva.
R	the REGNELL Herbarium, Stockholm.
S	the Stockholm Herbarium.
U	the Upsala Herbarium.

I regret very much that I have had no opportunity to visit the DESFONTAINES Herbarium in Florence, containing some important types of CASSINI.

Quite recently (July 1913, in Bull. Torr. Bot. Club, Vol. 40, No. 7) GLEASON has described a set of species from the West Indies, of which I have not seen authentic specimens. Alas, I cannot delay the publication of this paper until duplicate specimens are available in Europe, for I am very soon to undertake a journey to Hispaniola and eastern Brazil.

Finally I beg Prof. IGN. URBAN in Berlin to accept my sincerest thanks for his most valuable assistance in every possible way. Further, I am deeply indebted to Prof. C. A. M. LINDMAN in Stockholm for his never-failing kindness, and innumerable valuable hints and informations.

General remarks.

In the present paper only species of the genus *Vernonia* have been dealt with.

The delimitation of the genus adopted here, on the whole, is the same as that of HOFFMAN in ENGLER and PRANTL: Die

Natürlichen Pflanzenfamilien. A few modifications have, however, been made, chiefly according to the works of GLEASON. Like many North American botanists, he tends to split up large genera into smaller ones. I agree with him in removing *Lachnorhiza* A. RICH., *Leiboldia* SCH.-BIP., and *Cyanthillium* BLUME (= *Cyanopsis* BLUME) from *Vernonia*, but I do not approve the segregation of *Eremosis* (DC.). There are numerous species connecting *Eremosis* with *Critoniopsis* SCH.-BIP., which genus always has been considered a section of *Vernonia*. In fact, there are no characters of *Eremosis* that cannot be found again in certain species of other sections of *Vernonia*. *Eremosis* (DC.) GLEASON was characterized by 1—5-flowered heads in rounded panicles, and *Vernonia* by 8—88-flowered heads. However, there are many true *Vernoniæ* having as few-flowered heads as have the species of *Eremosis*, for instance, in the sections *Critoniopsis* and *Stenocephalum* (SCH.-BIP.). As for the rounded panicles, GLEASON himself has defined a division of *Lepidaploa*, *Paniculatæ umbelliformes*, having »subumbellate, rounded panicles».

Three isolated species have been transferred in this paper, one to the genus, and two from it. Prof. URBAN in 1899 described a *Piptocarpha tetrantha* from Porto Rico, nearly allied to *Piptocarpha triflora* BENNET from Guyana. The latter *Piptocarpha* is a genuine *Critoniopsis*, being closely related to the type of the genus, *Critoniopsis Lindenii* SCH.-BIP. from Columbia. If *Critoniopsis* be referred to *Vernonia*, *Piptocarpha triflora* BENN. and *Piptocarpha tetrantha* URB. must be so too. It is another question whether *Critoniopsis* inclusive of *Eremosis* are not to be generically distinguished from *Vernonia*. I will return to this subject elsewhere.

The two plants removed from the genus *Vernonia* are *V. lepidota* GRISEBACH and *V. Milleri* JOHNSTON. The former, differing already in habit from all true *Vernoniæ* of the West Indies, above all in its lepidote pubescence, is abundantly distinct in the structure of its pappus. The bristles of the inner series of pappus are very few, 5—6—7, broad, caducous, the scales of the outer series are *concreted with each other, forming a short, cylindrical tube*. The plant is related to *Piptocoma* CASS., which genus, however, has free outer scales.

Most probably *Vernonia lepidota* GRISEBACH is to be made the representative of a new genus.

Vernonia Milleri JOHNSTON from the island of Margarita was described in the year 1905. It is evidently an *Oliganthes*, having few-flowered heads, narrow involucre, and broad, somewhat curled scales of the inner series of pappus.

As for the delimitation of the sections of the genus, I have adopted the treatment given by HOFFMAN in ENGLER and PRANTL: Die Natürlichen Pflanzenfamilien, with the exceptions already mentioned. Save *Piptocarpha tetrantha* URBAN, and some introduced species, all West Indian Vernoniæ belong to the section *Lepidaploa* (CASS.) DC.

Within this section *Lepidaploa* the species have been before exclusively artificially grouped. The first attempt to arrange the species according to their relationships was made by GLEASON in his »Revision of the North American Vernoniæ». He correctly recognized several groups of species, for instance, the *Fruticosæ* and the *Argyropappæ*, but most of his other groups include species of different origin. He also has proceeded too far in splitting up the divisions of *Lepidaploa*, placing, for instance, *V. albicaulis* PERS. (= *V. longifolia* PERS.) in a particular group *Longifoliæ*, separated from its nearest relative, *V. icosantha* DC. (= *V. arborescens* Sw. of this paper). Especially unfortunate is he in arranging the forms of *V. divaricata* Sw., some of which he takes to be distinct species, putting them into three different species-groups (*V. arborescens* GLEASON, not Sw. among his *Arborescentes*, *V. albicoma* among the *Divaricatæ*, *V. permollis* and *V. intonsa* constituting a particular species-group). He is, further, absolutely wrong in assigning *V. lepidota* GRISEB. to the *Scorpioidæ reductæ*, *V. pallescens* GLEASON to the *Havanenses*, *V. canescens* H. B. K. to the *Deppeanæ*, many other mistakes not to be mentioned.

I have tried, in this paper, to arrange the species according to their relationships in subsections based in the first place on the characteristics of the inflorescence, in the second place on the pubescence of achenes and corollas and on the structure of the pappus. The arrangement proposed is by no means definitive. All delimitation of taxonomic units in *Vernonia* is extremely difficult, from that of the species up to the genus.

The differences existing as to the shape of corollas, size of anthers etc. have been generally regarded as being of little importance in delimitating species and groups in *Vernonia*. In order to ascertain if these characters actually have no value, I have analyzed numbers of flowers of all the species mentioned in this paper, and of many South American ones. In general, the characters found agree with those of habit and inflorescence, and no striking results have been obtained. Yet they have proved to be of same value for recognizing smaller groups of the subsections and for identifying the species. More interesting is the fact stated through these examinations of flowers that the basal lobes of the anthers, which are said to be obtuse in *Vernonia*, sharply acute in *Piptocarpha*, very often are acute in *Vernonia* too. This should mean that the only difference between *Piptocarpha* and *Vernonia* vanishes. I hope I shall have an opportunity to return to this in another paper.

As characters of the flowers are seldom mentioned in the descriptions of *Vernoniæ*, I have under each species listed in this paper given its analytical distinctions.

As to the species themselves, there will be found to exist a certain difference between my treatment of the West Indian ones and that of GLEASON, not only in regard to their names, but to their delimitation. In GLEASON's paper the species are very small, narrowly defined and, as a rule, based upon a very meagre material; my species are in general much wider, including several forms described by him as proper species. Yet my work also has been compiled upon the principle: to separate what can be separated practically. It may be that GLEASON has another conception of species than I have, as North American botanists on that point often differ from European ones (cfr. OTTO KUNTZE, Rev. gen. plant., Band III^{II}, 1898, p. 144, the note). It is, possibly, beyond his reach to conceive, for instance, the striking common features of his *V. arborescens*, *V. intonsa*, *V. permollis*, *V. albicoma* and *V. amaranthina*, which is the evidence of their being all merely forms of one species. He keeps, apparently, his mind open to the differences, not to the affinities. But he will, I am sure, not fail to find that, with the description of new species like the above mentioned, the delimitation of the already existing ones will become always more

difficult, and that all, at last, will end in chaos. He would be justified in describing his forms as species, if he could state that they are constant in the same manner as the micro-species of *Alchemilla*, *Hieracium*, and *Taraxacum*, where apogamy is the basis of the Jordanismus. I do not mean, of course, that all species described by GLEASON are inferior ones. On the contrary, he has had the opportunity of describing some of the most striking of the West Indian species.

What apogamy is, for instance, for the parthenogenetic species of *Alchemilla*, a geographical isolation may prove to be for the West Indian Vernoniæ. I have myself distinguished *V. angustissima* WRIGHT mscri. from *V. stenophylla* LESS. in part owing to the fact that the former is a Cuban plant, the latter a member of the flora of Hispaniola. And another instance, *V. sericea* L. C. RICH., growing in Hispaniola, has been found to differ from the Porto Rico plant in having invariantly larger anthers; it will consequently be segregated here, yet only as a subspecies, the habits of the two plants being nearly identical. As matters now stand, the three larger Antilles, Cuba, Jamaica, and Hispaniola, have no common species of *Vernonia*, except the cosmopolitan *V. cinerea* LESS.

I confess to have learnt one thing from the North American botanists — not to describe innumerable varieties under each variable species, as do many European botanists. In dealing with Vernoniæ, one should be satisfied to state to which *species* a certain plant belongs. In order to give an idea of the variability of some species, I have, however, described some of their most striking forms, though without indicating any form by a proper name.

As to the history etc. of the genus *Vernonia* in the West Indies, I refer to the interesting exposition given by GLEASON in his »Revision». Several dates on the same object will be found under the respective species in this paper.

The name of each species accepted here is the earliest valid one, as governed by the Vienna rules of Nomenclature, adopted at the International Botanical Congress in Vienna 1905.

Vernonia SCHREB.

Key to the West Indian sections.

- I. Inner involucreal scales with dilatated, membranaceous, purplish-green tips. Bristles of the inner series of pappus broad, flat, caducous. Tube $\frac{7}{8}$ in length of the corolla.
Sect. *Stengelia*.
- II. Tips of the scales not dilatated. Bristles of the inner series of pappus filiform or very inconspicuously flattened. Tube not over $\frac{4}{5}$ of the corolla.
 - A. Inner scales caducous. Sect. *Critoniopsis*.
 - B. Inner scales persistent.
 - 1. Inner bristles of pappus persistent. Achenes conspicuously 10-costate. Sect. *Lepidaploa*.
 - 2. Inner bristles caducous. Achenes faintly ribbed. Sect. *Tephrodes*.

Sect. *Stengelia* (SCH.-BIP.) BENTH.

Vernonia anthelmintica (L.) WILLD.

Conyza anthelmintica LINNÆUS, 1763, p. 1207.

Vernonia anthelmintica WILLDENOW, 1804, p. 1634.

Pappi setæ interiores caducæ, numero circ. 30(?), firmæ, valde complanatæ, pallide stramineæ, exterioribus late linearibus circ. 8-plo longiores. Corolla glabra, 9 mm longa, tubo gracili, superne subito dilatato, long. $\frac{7}{8}$ corollæ, limbi laciniis brevibus, apice papillois. Antheræ fere 2 mm longæ, ligula long. $\frac{1}{5}$ antheræ, auriculis acutis.

Hab. in Jamaica: Green Harbour, alt. 540 m, 13. 12. 94, HARRIS n. 5472 (BB, Br, KU, M).

A well known, widely distributed species of the Old World, introduced in Jamaica.

Sect. *Critoniopsis* (SCH.-BIP.) BENTH.

Vernonia tetrantha (URB.) EKMAN nov. comb.

Piptocarpha tetrantha URBAN, 1899, p. 457; 1911, p. 620; GLEASON, 1906 b, p. 160.

Hab. in Porto Rico.

As to the description and distribution of the species I refer to URBAN, l. c.

The genus *Critoniopsis* SCH.-BIP. was based upon a plant from Columbia, *Critoniopsis Lindenii* SCH.-BIP., nearly related to *Piptocarpha triflora* BENNET from Guyana. Now *Piptocarpha tetrantha* is said to be closely allied to *P. triflora*, and hence I conclude, without having seen specimens of URBAN's plant, that it is a *Critoniopsis*. This genus has always been considered a section of *Vernonia*. It differs from the genuine Vernoniæ of the section *Lepidaploa* in having, as a rule, few-flowered heads, caducous inner involueral scales and acute basal lobes of the anthers. There exist, certainly, forms intermediate between *Critoniopsis* and *Eremosis* (DC.) GLEASON, for instance, *V. (Eremosis GLEASON) Heydeana* COULTER, so that the species of *Eremosis* must be referred to *Critoniopsis*. Some specimens of *Eremosis* have persistent inner scales. The Brazilian species of *Critoniopsis*, for instance, *V. discolor* LESS., have throughout typical *Vernonia*-inflorescence as well as many-flowered heads. Many genuine *Lepidaploa* have acute basal lobes of the anthers. It will be seen that there is no character to distinguish *Critoniopsis* generically from *Vernonia*.

The genuine *Piptocarpha* have a characteristic inflorescence, dense axillary clusters of heads, and differ in habit widely from *Critoniopsis*. However, there are genuine Vernoniæ having the same inflorescence as *Piptocarpha*, for instance, *V. Vauthierana* DC. (referred erroneously by BAKER in Fl. Bras. to *Piptocarpha*!). It seems to me as if *Piptocarpha* should be made a section of *Vernonia*, having been primarily considered so by LESSING and DE CANDOLLE.

Sect. *Lepidaploa* (CASS.) DC.

Conspectus subsectionum antillanarum.

- I. Inflorescentia cymoso-scorpioidea, calathidiis bracteis foliaceis suffultis.

A. *Achænia* glaberrima.

1. Inflorescentia cymis elongatis. Suffrutices inferne simplices, foliis magnis, membranaceis vel subcoriaceis. — Species in Antillis majoribus (Cuba et Hispaniola), nec non in Brasilia vigentes.

Subsect. *Sagræanæ*.

2. Inflorescentia cymis brevissimis, habitu umbellata. Frutices valde ramosi, foliis parvis, rigide coriaceis. — Species in Hispaniola endemicæ.

Subsect. *Buxifoliæ*.

B. Achænia appresse sericeo-pubescentia.

1. Corollæ limbus laciniis dorso pilosis. Suffrutices. Inflorescentia cymis sæpissime elongatis, cauliformibus. Calathidia parva. — Species pro max. parte austro-americanæ, una in Bequia, altera in Trinidad.

Subsect. *Graciles*.

2. Corollæ limbus laciniis dorso glabris, ipsissimo apice interdum pilo uno alterove instructis. Frutices, suffrutices vel herbæ. Inflorescentia sæpius distincta. Calathidia vulgo mediocria. — Species præsertim antillanæ.

Subsect. *Arborescentes*.

II. Inflorescentia ebracteata.

A. Inflorescentia cymoso-scorpioidea, i. e. calathidia omnia sessilia.

1. Pappi setæ exteriores distinctæ. Suffrutices sæpe scandentes. Calathidia in cymis contigua. Pappi setæ albæ. — Species austro-americanæ, una in regione australi-antillana.
2. Pappi setæ exteriores filiformes, quam maxime indistinctæ. Suffrutex elatus. Calathidia in cymis remota. Pappi setæ brunneæ. — Species unica, in St. Vincent obvia.

Subsect. *Pallescentes*.

B. Inflorescentia cymoso-paniculata, i. e. calathidia saltem inferiora pedunculata.

1. Inflorescentia convexa, ambitu rotundata. Suffrutices elati. Calathidia parva—mediocria. Pappus sæpissime albidus vel stramineus, rarissime purpurascens. — Species a Mexico meridiem versus distributæ, nonnullæ in Cuba.
2. Inflorescentia plana vel concava, ambitu late obpyramidata. Suffrutices elati. Calathidia majuscula. Pappus sæpe purpurascens. Corollæ et antheræ quam in præcedenti majores. — Species a Mexico septentrionem versus distributæ, una in insulis Bahamensibus.

Subsect. *Noveboracenses*.

Subsect. **Sagræanæ.**

Suffrutices apice ramosi. Folia membranacea, breviter petiolata vel subsessilia, elliptica vel late lanceolata, glabra—tomentosa, satis magna. Inflorescentia cymoso-scorpoidea, cymis elongatis; bracteis evolutis, foliaceis. Calathidia majuscula. Involucrum campanulatum vel cylindricum, squamis multiseriatis, imbricatis; appressis vel interdum apice recurvatis, obtusis vel breviter cuspidatis. Receptaculum planum, nudum. Pappi setæ interiores persistentes, firmulæ, numero 40—70, exterioribus distinctis 6—10-plo longiores. Corolla 8—10 mm longa, glabra, tubo long. $\frac{2}{3}$ corollæ. Antheræ magnæ, 3 mm et ultra longæ, ligula long. $\frac{1}{6}$ — $\frac{1}{10}$ antheræ. Achænium glaberrimum.

A very natural subsection, easily recognized by the large heads, flowers and anthers, and, above all, by its glabrous achenes. It shows no relationship with other West Indian subsections, but is allied to *V. glabrata* LESS. and other Brazilian species. It is a remarkable fact that the allies of *V. glabrata* do not occur in North Brazil nor in Guyana. Some species belonging here have been found, however, in the Andes of Bolivia, viz. *V. robusta* RUSBY, *V. subacuminata* HIERON. (= *V. obtusata* LESS.) and *V. velascensis* HIERON.

GLEASON, having, of course, recognized the subsection, in his »Revision» named it *Fruticosæ*, supposing *Vernonia fruticosa* (L.) Sw. to belong here. Recently he has found that the latter species is to be removed from this subsection, and he now calls the subsection *Sagræanæ*, which name I have adopted here, as I had originally used it myself just in the same sense.

Nearly all species of the subsection are imperfectly known, the material collected being very meagre. Continued collections are badly needed to supply dates for a definitive delimitation of the species, as well as for their frequency and distribution.

The distinctions of the species which belong here will appear from the following key.

Conspectus specierum hujus subsectionis.

I. Calathidia omnia plane sessilia. — Species cubenses.

A. Folia subtus glabra, puberula aut laxe villosa, haud tomentosa.

1. Squamæ involucri omnes erectæ, appresso-imbri-catæ.

a. Folia subtus glabra aut puberula.

α. Involucrum campanulatum. Calathidia 20—25-flora. Folia glabra.

† Folia elliptica, breviter acutata, membranacea, plana, tenuiter reticulato-venosa. Pappus sordide brunnescens.

V. Sagreana DC.

†† Folia late lanceolata, acuta, coriacea, subbullata, vix reticulata. Pappus stramineus.

V. Valenzuelana A. RICH.

β. Involucrum cylindricum. Calathidia 8—11-flora.

† Folia subtus glabra, valde rugosa. Involucrum 6 mm altum. Squamæ acutissimæ, interiores apice colore purpureo tinctæ.

V. purpurata GLEASON.

†† Folia subtus puberula, plana. Involucrum 8—9 mm altum. Squamæ obtusæ, brevissime apiculatæ, interiores apice pallide brunneæ.

V. angusticeps EKMAN.

b. Folia subtus pilis albidis, longis laxe sericeo-villosa. Squamæ dense villosæ, conspicue spinoso-mucronatæ.

V. viminalis GLEASON.

2. Squamæ involucri saltem exteriores squarrosæ, patentes—recurvatæ.

a. Calathidia 34—47-flora. Involucrum 8—9 mm altum, sicc. ad 15 mm latum. Squamæ lanceolato-lineares, subulatæ. Pappus albus.

V. aronifolia GLEASON.

b. Calathidia circ. 17-flora. Involucrum 7 mm altum, 8—9 mm latum. Squamæ deltoideæ, breviter mucronatæ. Pappus sordide brunnescens.

V. Wrightii SCH.-BIP.

B. Folia subtus breviter, sed dense tomentosa, subdiscolora.

1. Squamæ interiores obtusæ vel subacutæ, intermediæ haud marginatæ. *V. fallax* GLEASON.

2. Squamæ interiores apiculatæ, intermediæ conspicue marginatæ.

a. Folia basi attenuata. Calathidia 15-flora.

V. inæquiserrata SCH.-BIP.

b. Folia ipsa basi rotundata.

α. Folia anguste oblonga, apice rotundata. Calathidia 22-flora. *V. linguæfolia* EKMAN.

β. Folia angustissime lineari-oblonga, apice breviter acuta. Calathidia 11—13-flora.

V. aceratoides GLEASON.

II. Calathidia breviter pedunculata. Folia subtus argenteo-tomentosa. — Hispaniola. *V. Sprengeliana* SCH.-BIP.

Vernonia Sagraana DC.

Tabula nostra I, fig. 5 (folium).

Vernonia Sagraana DE CANDOLLE, 1836, p. 55; GLEASON, 1906 b, p. 183; 1913, p. 321.

Vernonia rigida Sw. var. *Sagraana* GRISEBACH, 1866, p. 144.

Vernonia foliosa WRIGHT in sched. herb. GRISEBACH — non GARDN., nec. SCH.-BIP.

Pappi setæ interiores persistentes, numero fere 40, tenues, filiformes, sordide brunnescentes, quam exteriores spatulato-lineares, distinctæ circ. 8-plo longiores. Flores in speciminibus mihi commissis desunt.

Hab. in Cuba: prope Havana, leg. RAMON DE LA SAGRA, n. 73 (P, Prodr, orig. spec.), n. 230 (P), n. 663 (Prodr), sine num. (CD); WRIGHT n. 281 (G, KU, S), n. 284 (Bss, DC, P).

The specimens collected by WRIGHT agree in every particular with those collected by RAMON DE LA SAGRA.

Vernonia Valenzuelana A. RICH. ap. SAGRA.

Tabula nostra I, fig. 2 (folium).

Vernonia Valenzuelana A. RICH. ap. SAGRA, 1850, p. 33; GLEASON, 1906 b, p. 184; 1913, p. 321, 322.

Vernonia rigida Sw. var. *Valenzuelana* GRISEBACH, 1866, p. 144.

Pappi setæ interiores persistentes, numero 70, tenues, filiformes, stramineæ, exterioribus subfiliformibus circ. 8-plo longiores. Corolla 9 mm longa, tubo long. $\frac{3}{4}$ corollæ, glabro. Antheræ 3 mm longæ, ligula brevi, fere $\frac{1}{9}$ long. antheræ, auriculis brevibus, in apicem obtusiusculum subito contractis.

Hab. in Cuba: RAMON DE LA SAGRA, sine num. (KU, P, orig. spec.); WRIGHT n. 284 (KU, S), n. 2785 (G, KU).

Vernonia purpurata GLEASON.

Vernonia purpurata GLEASON, 1913, p. 322.

Hab. in Cuba orientali: Sierra Maestro, in monte Jiquarito, alt. 1020 m, 18. 9. 06, TAYLOR n. 544.

I have seen no specimens of this species. From the description it comes near to *V. angusticeps* EKMAN; the differences will be discussed under that species.

Vernonia angusticeps EKMAN n. sp.

Tabula nostra I, fig. 3 (folium et cyma).

Herba suffruticosa, perennis. Caulis (pars superior tantum adest) erectus, satis validus, verisimiliter metralis, 4—5 mm diam., inferne simplex, superne ramosus, teres, striatus, superne præsertim pilis intricatis, cinereo-fuscis floccoso-tomentosus, densiuscule foliosus. Folia patentia-deflexa, breviter petiolata, petiolo 3—4 mm longo, supra canaliculato, floccoso-tomentoso; laminæ lanceolato-oblongæ, 8—9 cm longæ, 2,4—2,6 cm latæ, apice acuto-acuminatæ, basi oblique truncatæ, firmulæ, fusco-virides, integræ, margine subplanæ, remote denticulatæ, supra glabriusculæ, subnitidæ, sublaeves, reticulatæ, subtus pallidiores, piloso-puberulæ, tenuiter, tamen distincte areolatæ, costa valida, subtus pulchre prominente, nervis utriusque lateris numero 12—14, arcuatis, exsculptis, nervulis distinctis, anastomosantibus. Inflorescentia cymoso-scorpioidea, satis ampla, sublucida, cymis erecto-patulis, iter iterumque ramificatis, strictiusculis, maximis 12 cm longis, 10—15-cephalis; bracteis foliaceis, calathidiis multoties longioribus. Calathidia axillaria, sessilia, in-

fima remotiuscula, summa congesta, 9—11-flora. Involucrum cylindricum, 8—9 mm longum, 3 mm latum, basi rotundatum, squamis imbricatis circ. 6-seriatis, extimis ovato-triangularibus, mucronulatis, marginibus apiceque floccoso-tomentosis, intermediis oblongis, obtusis, intimis elongatis, ligulatis, velut intermediæ subglabris, obtusiusculis, omnibus obsolete carinatis, minutissime ciliolatis, fuscis. Pappi setæ interiores persistentes, numero 40, firmæ, filiformes, 6,5 mm longæ, albo-stramineæ, exterioribus distinctis, spathulato-linearibus circ. 7-plo longiores. Flores desunt, speciminibus visis nempe fructus tempore collectis. Achænium obscure tetragonum, subcompressum, inferne obsolete 10-costatum, glaberrimum, glandulosum, 3 mm longum.

Hab. in Cuba orientali: C. WRIGHT, ann. 1856—7, sub num. 284 (Bss, D, DC, spec. orig.).

The most striking feature of the new species is its very narrow, cylindrical involucre and, connected with this, the small number of flowers in the heads. I did not know any other species of the subsection having these characters, until GLEASON in his »Studies» described a *V. purpurata*, having also cylindrical involucre and very few-flowered heads. Yet the two species are not identical, as proved by the following differences. The leaves of *V. angusticeps* are membranaceous, not »heavy, rigid, coriaceous», flat, not »strongly rugose above», not »shining», puberulent at the whole of the lower surface, not only »along the veins beneath»; the bracteal leaves are present below all heads; the heads are 9—11-flowered, not »8-flowered»; the involucre are 8—9 mm high, not »6 mm high», their scales are rounded at the tips, shortly apiculated, not »sharply acute», brownish, not »purple-brown at their exposed tips».

I think the reason why the species has not been described long before is that it is so poorly represented in herbaria. I only saw it in those of Geneva.

Vernonia viminalis GLEASON.

Tabula nostra I, fig. 1 (folium et cyma).

Vernonia viminalis GLEASON, 1906 b, p. 184; 1913, p. 321.

Pappi setæ interiores persistentes, numero 40, tenues, filiformes, exterioribus distinctis circ. 10-plo longiores. Co-

rolla 9 mm longa, glabra. Antheræ 3,3 mm longæ, ligula long. $\frac{1}{8}$ antheræ, auriculis ipsissimo apice obtusis.

Hab. in Cuba: WRIGHT n. 285 (B, CD, KU, S).

The species is at once recognized by its peculiar pubescence.

Vernonia aronifolia GLEASON.

Vernonia aronifolia GLEASON, 1913, p. 323.

Hab. in Cuba: prov. Pinar del Rio, prope Sumidero, in rupibus calcareis, 2—4. 8. 12, SHAFER n. 13514.

Not seen. In leaf-characters this species must be identical with *V. Wrightii* SCH.-BIP., and in reading the description I at first believed there was no difference at all. However, it seems to be distinguished from *V. Wrightii* by its large, many-flowered heads, narrow, subulate scales and white pappus.

Vernonia Wrightii SCH.-BIP.

Tabula nostra I, fig. 9 (folium et cyma).

Vernonia rigida GRISEBACH, 1862, p. 511 (»var. *V. Sagræana* DC.«) — non Sw.

Vernonia Wrightii SCHULTZ-BIPONTINUS, 1863, p. 234.

Vernonia leptoclada GLEASON 1906 b, p. 183 — non SCH.-BIP.

Pappi setæ interiores persistentes, numero 55, tenues, filiformes, sordide brunnescentes, exterioribus distinctis 6-plo longiores. Corolla 8,5 mm longa, glabra. Antheræ 3 mm longæ, ligula long. $\frac{1}{7}$ antheræ, auriculis satis longis, attenuatis, ipso apice obtusiusculis.

Hab. in Cuba orientali: prope villam Monte Verde dictam, Jan.—Jul. 1859, WRIGHT n. 284 (CD, orig. spec., sub num. falso 1309, G, K, KU, P); in monte La Clarita, alt. 800 m, mens. Apr. 1889, EGGERS n. 5017 (KU); Oriente, Loma Santa Teresa, prope El Yunque, in collibus siccis, 2. 12. 10, SHAFER n. 7738 (KU); Oriente, Camp La Gloria, prope Sierra Moa, 24—30. 12. 10, SHAFER n. 8145 (KU).

In the collection of Compositæ; made by WRIGHT and sent by ASA GRAY to SCHULTZ-BIPONTINUS for determination, the labels of the numbers 284 and 1309 had been interchanged. Hence n. 1309 in the COSSON-DURAND herbarium at Paris is the same as n. 284 in other herbaria, and

this is the true *V. Wrightii* SCH.-BIP., as shown by the description and the handwriting of SCHULTZ-BIPONTINUS. GRISEBACH, in his *Cat. Plant. Cub.*, p. 144, applies the name of *V. Wrightii* to the plant generally numbered 1309, which is *V. leptoclada* SCH.-BIP. Not accepting this plant as a species, he cites it as a form of *V. arborescens* Sw., though maintaining the binomial writing («*V. Wrightii* SCH., forma foliis angustioribus subtus tomentosis, capitulis folio florali multo brevioribus»). He does not mention anything about *V. leptoclada* SCH.-BIP. GLEASON, who has read the descriptions of SCHULTZ-BIPONTINUS, but not discovered the mystery of the interchanged labels, in the «Revision» assigns correctly *V. Wrightii* SCH.-BIP. to his *Fruticosæ* (i. e. his *Sagræanæ*), though as a synonym of *V. Sagræana* DC. He applies, further, the name of *V. leptoclada* to the plant which in fact corresponds to *V. Wrightii*. The true *V. leptoclada* SCH.-BIP. he refers to *V. gnaphalifolia* A. RICH., and consequently describes the genuine *V. gnaphalifolia*, which thus had no name at its disposal, as a new species, *V. sublanata* GLEASON. His remarks on *V. gnaphalifolia* A. RICH. read as follows: «*Vernonia Wrightii* GRISEB. l. c.; Not *V. Wrightii* SCH.-BIP.», and further: «Wright's collection, 1309, included two species, one a form with broad smooth leaves, *V. Sagræana* DC., and the other with tomentose leaves. The first was taken by SCHULTZ as the type of his *V. Wrightii*. GRISEBACH, apparently considering that the number included but one species, published the name for the second form, thus introducing the synonyms cited above». Evidently, this is an attempt of GLEASON to explain the lack of harmony found between the descriptions of SCHULTZ-BIPONTINUS and the plants corresponding to them according to their numbers. In working out his «Studies» he had learnt that his *V. sublanata* is identical with *V. gnaphalifolia* A. RICH. Thus his *V. gnaphalifolia* had no name, and consequently he names it *V. neglecta* GLEASON, creating in this manner one synonym more for the true *V. leptoclada* SCH.-BIP. Still believing that this species belongs to the *Sagræanæ*, he identifies with it SHAFER n. 8145, a genuine *V. Wrightii* SCH.-BIP. Another plant, SHAFER n. 7738, he refers to *V. Wrightii*, though with some reservation. However, it differs from the genuine *V. Wrightii*

only in having more elongated and spreading scales with recurved tips.

A brief description of *V. Wrightii* may be of some use: Branches densely tomentose, hairs brown, spreading. Leaves obovate-oblong, 8—9 cm long by 4 cm wide, firm, not coriaceous, glabrous and smooth above, finely pubescent at the veins beneath, remotely denticulate with spinulose teeth at the margin. Heads about 17-flowered. Involucres 7 mm high, about 8—9 mm broad in press-dried specimens, its scales deltoid, spreading with short, subulate tips, brownish-green. Pappus 6 mm long, sordid-tawny, not at all purplish.

Vernonia fallax GLEASON.

Vernonia fallax GLEASON, 1913, p. 324.

Hab. in Cuba: prov. Santa Clara, in montibus Trinidad, ad rupes, alt. 500 m, 12. 3. 10, BRITTON et WILSON n. 5478.

I have not seen this species, but from the description it must be a rather good one, though closely related to *V. inaequiserrata* SCH.-BIP.

Vernonia inaequiserrata SCH.-BIP.

Tabula nostra I, fig. 4 (folium).

Vernonia rubricaulis GRISEBACH, 1862, p. 511 (»forma foliis latioribus») — non H. B. K.

Vernonia inaequiserrata SCHULTZ-BIPONTINUS, 1863, p. 232; GRISEBACH, 1866, p. 144, excl. var.; GLEASON, 1906 b, p. 183; 1913, p. 321.

Pappi setæ interiores subpersistentes, numero 55, tenues, filiformes, albidæ, quam exteriores distinctæ, spathulatae circ. 12-plo longiores. Corolla 10,5 mm longa, tubo sensim dilatato long. $\frac{2}{3}$ corollæ, glabro, limbi laciniis apice subtus papillois. Antheræ 3,5 mm longæ, ligula long. $\frac{1}{7}$ antheræ, auriculis breviter apiculato-contractis.

Hab. in Cuba orientali. Sept. 1859—Jan. 1860, WRIGHT n. 285 prior (Bss, CD, orig. spec., D, DC, G, K, KU, P).

I long endeavoured to keep within the limits of *V. inaequiserrata* its two varieties, distinguished already by GRISEBACH, viz. var. *angustifolia* and var. *obtusifolia*. However, GLEASON

describes in his »Studies» the first one as a species, which, indeed, it may be. Consequently I have to describe the second as a species, too, for it differs as amply from *V. inæquiserrata* as does the first. It seems to me more advisable to describe a new species, even though not a very striking one, than to reduce another without very strong reasons.

A few words about the characteristics of the now more narrowly delimited *V. inæquiserrata*. Leaves broadly lanceolate, 9 cm long, 2,5 cm wide, narrowed at base, acute, sharply serrate, fulvo-cinereous beneath, not conspicuously reticulated. Heads 15-flowered. Involucres 7—8 mm long, 4,5 mm broad, inner scales somewhat elongated.

An interesting form (?) of this is in the Kew Herbarium, having lanceolate, entire leaves, 7 cm long, 1,45 cm wide.

Vernonia linguæfolia EKMAN n. sp.

Tabula nostra I, fig. 6 (folium).

Suffrutex vel herba perennis, certe metralis et ultra. Caulis (cujus pars superior tantum adest) erectus, inferne lignosus, diam. 3,5 mm, simplex, superne ramosus, teres, striatus, inferne subglaber, superne brevissime appressotomentosus, sat crebre foliatus. Folia alterna, patentia, breviter petiolata, petiolo fere 2 mm longo, tomentello; laminæ late lineari-oblongæ, anguste linguæformes (unde nomen!), 9,5 cm longæ, 1,8 cm latæ, apice rotundatæ, obtusæ, basi rotundatæ, membranaceæ, planæ, margines versus reticulato-rugosæ, integræ, obscure crenulatæ, supra olivaceo-virides, levissime scaberulæ, obsolete hispidulo-puberulæ, subtus discolors, tomento brevissimo, rufo-cinereo, costa nervisque utriusque lateris numero ad 15 angulo subrecto exeuntibus, demum sursum arcuatis, margines versus reticulatim anastomosantibus, subtus pulchre prominentibus. Inflorescentia cymoso-scorpioidea, ambitu late obpyramidata, 1,5 dm longa et totidem lata, diffusa, cymis ad 15 cm longis, inferne simplicibus, ad medium sæpe divaricatim ramosis, leviter recurvis, circ. 15-cephalis, calathidiis inferne spatio circ. 1,5 cm longo disjunctis, superne approximatis; bracteis foliaceis, inferioribus folia æquantibus, superioribus gradatim minoribus, calathidiis semper conspicue longioribus.

Calathidia axillaria, sessilia, solitaria, 19—22-flora. Involucrum late campanulatum, 6—7 mm altum, 5—6 mm latum, squamis circ. 5-seriatis, extimis brevissimis ovato-deltoides, breviter acutis, brevissime mucronulatis, intermediis anguste oblongis, obtusis, intimis lineari-ligulatis, obtusiusculis, omnibus erectis, appressis, imbricatis, inferne glabris, stramineis, superne pallide brunneis, tomentellis. Receptaculum planum, nudum. Pappi setæ interiores subcaduæ, numero 50, tenuissimæ, albidæ, 6 mm longæ, quam exteriores distinctæ circ. 10-plo longiores. Corolla 10,5 mm longa, glabra, tubo sensim dilatato long. $\frac{2}{3}$ corollæ. Antheræ 3,3 mm longæ, ligula $\frac{1}{7}$ long. antheræ, auriculis brevibus, subito contractis. Achænium (immaturum) 10-costatum, glaberrimum.

Vernonia inæquiserrata SCH.-BIP. var. *obtusifolia* GRISEBACH, 1866, p. 144.

Hab. in Cuba orientali: WRIGHT n. 285 posterior (G, spec. orig., KU, S).

The species differs from *V. inæquiserrata* in its obtuse, crenulate leaves with rounded base and in the many-flowered heads. As to its floral characters, it comes rather near to *V. inæquiserrata*. From *V. aceratoides* GLEASON it is distinguished by its broader, always obtuse leaves and by its many-flowered heads. A comparison of the structure of the flowers will also afford good distinctions.

Vernonia aceratoides GLEASON.

Tabula nostra I, fig. 7 (folium).

Vernonia inæquiserrata SCH.-BIP. var. *angustifolia* GRISEBACH, 1866, p. 144.

Vernonia aceratoides GLEASON, 1913, p. 325.

Pappi setæ interiores subcaduæ, numero 50, tenuissimæ, albidæ, quam exteriores spathulatæ circ. 10-plo longiores. Corolla 7 mm longa, glabra, tubo $\frac{2}{3}$ long. corollæ. Antheræ 2,8 mm longæ, ligula $\frac{1}{7}$ — $\frac{1}{8}$ long. antheræ, auriculis breviter apiculato-contractis.

Hab. in Cuba: WRIGHT n. 2784 (Bss, DC, G, K, KU, P).

A good character of this species not mentioned by GLEASON is the small number of flowers in the heads, 11—13.

Very near to this species comes a plant collected by EGGERS in Cuba, Loma del Jaguey, 22. 4. 89, n. 4982 (KU). It differs in having lanceolate leaves, which are very bullate and nearly glabrous beneath. The only specimen seen is very imperfect.

Vernonia Sprengeliana SCH.-BIP.

Tabula nostra I, fig. 8 (cyma).

Eupatorium salvifolium BERTERO in sched. ap. SPRENGEL, 1826, p. 412.

Vernonia Sprengeliana SCHULTZ-BIPONTINUS, 1863, p. 232; GLEASON, 1906 b, p. 184; 1913, p. 321.

Pappi setæ interiores persistentes, numero 45—50, tenues, albidæ, exterioribus distinctis 8-plo longiores. Corolla 9—9,5 mm longa, glabra, tubo $\frac{2}{3}$ corollæ long., limbi laciniis apice subtus papillois. Antheræ 3—3,5 mm longæ, ligula long. $\frac{1}{8}$ antheræ, auriculis brevibus, brevissime acuminatis.

Hab. in Hispaniola: BERTERO (CD, orig. spec.); SCHOMBURGK (K); MAYERHOFF (B, CD, KU); PICARDA n. 301, 301 b (KU); prope Pétionville, anno 1889, PICARDA n. 885 (KU); in montibus Sierra del Palo quemado, locis calcareis, 10. 5. 87, EGGERS n. 1887 (Br, D, DC, K, KU); in collibus siccis prope Gonaïves, mense Dec. 1898, BUCH n. 10 (KU); ibidem, mense Nov. 1900, BUCH n. 523 (KU); prov. Barahona, Las Salinas, Los Charcos, alt. 1200 m, Sept. 1911, MIGUEL FUERTES n. 1388 (KU).

A very distinct and always readily recognized species! Though there is considerable variation as to the size of the heads and the density of the inflorescence, the material of this species must be considered as unusually uniform.

SCHULTZ-BIPONTINUS quotes two synonyms of the species, *Eupatorium salicinum* LAM. and *Eupatorium salvifolium* BERTERO. The latter belongs to the species and is a mere name without any description. *Eupatorium salicinum* LAM. is a true *Eupatorium*, having opposite leaves, though in shape somewhat resembling those of *V. Sprengeliana*, and was collected in Peru. Now KURT SPRENGEL, unfortunately, in his Systema referred *Eupatorium salvifolium* BERTERO to *Eupatorium salicinum* LAM., whence the quotation of SCHULTZ-BIPONTINUS. Of course, *Eupatorium salvifolium* BERTERO

as a nomen nudum cannot invalidate *Vernonia Sprengeliana* SCH.-BIP.

Subsect. *Buxifoliæ*.

Frutices ramosissimi. Folia coriacea, parva. Inflorescentia cymosa, cymis brevissimis, uni- vel paucifloris, cum calathidiis primariis pedunculatis axe valde abbreviato insidentibus, item umbellas subsimplices, depauperatas formantibus; bracteis foliaceis cymis suffulcientibus. Calathidia parva, circ. 10-flora. Involucrum infundibuliforme vel anguste infundibuliforme-campanulatum, squamis imbricatis, subglabris. Receptaculum nudum, subplanum. Pappi setæ interiores persistentes, rigidulæ, crassiusculæ, paullulo complanatæ, exteriores breves, parum distinctæ. Corolla glabra. Antheræ ultra 2,5 mm longæ, ligula longa, $\frac{1}{3}$ — $\frac{1}{4}$ long. antheræ. Achæ-nium glaberrimum, glandulosum.

A very small subsection, including only two species from Hispaniola, easily recognized by their shrubby rigid habit, the peculiar structure of the inflorescence, and by their glabrous achenes. GLEASON made this subsection a particular division of *Lepidaploa*: *Scorpioideæ aggregatæ*; yet he refers to it in his »Revision» *V. Thomæ* BENTH., which he correctly discards in his »Studies», and *V. yunquensis* GLEASON, which does not belong here at all.

The two species of the subsection have no allies in the West Indies, nor in Central America, nor in the Andes. Possibly some Brazilian species, e. g. *V. nitidula* LESS., may approach to the *Buxifoliæ*. Future investigations may prove this.

Conspectus specierum hujus subsectionis.

- I. Folia subtus glabra. Calathidia 8-flora. Pappi setæ stramineo-rufescentes. *V. buxifolia* (CASS.) LESS.
- II. Folia discolora, subtus appresse tomentella. Calathidia 9—11-flora. Pappi setæ stramineo-purpurascetes.
V. Tuerckheimii URB.

Vernonia buxifolia (CASS.) LESS.

Tabula nostra I, fig. 11 (habitus).

Lepidaploa buxifolia CASSINI, 1823, p. 18.

Proustia domingensis SPRENGEL, 1826, p. 502.

Vernonia buxifolia LESSING, 1829, p. 313.

Vernonia domingensis DE CANDOLLE, 1836, p. 30.

Cacalia buxifolia KUNTZE, 1891, p. 968.

Vernonia montana GLEASON, 1906 b, p. 191; 1913, p. 327.

Pappi setæ interiores subpersistentes, numero 50, crassiusculæ, paullulo complanatæ, subrigidæ, pallide rufescentes, exterioribus linearibus, inconspicuis 8—10-longiores. Corolla (haud evoluta) 4 mm longa, tubo amplo, glabro, long. $\frac{1}{2}$ corollæ, limbi laciniis ipso apice pilo uno alterove instructis, subtus papillois. Antheræ 2,5 mm longæ, ligula long. $\frac{1}{4}$ antheræ, subnervi, auriculis obtusis.

Hab. in Hispaniola: NECTOUX (P); POITEAU (P); BERTERO (M, Prodr. orig. spec. *Proustia domingensis* SPR.); prope Port au Prince in Morne Tranchant, alt. 1900 m, April. 1892, PICARDA n. 1023 (KU); inter Constanza et Rio Jimenoa, alt. 1900 m, mense Junio 1910, TÜRCKHEIM n. 2959 B (KU); »in cuspide montium La Hajó», mense Oct. 1910, MIGUEL FUERTES n. 597 (KU, P); inter La Brande et montem Balance, ad arbores scandens, alt. 1000 m, 15. 8. 05, NASH et TAYLOR n. 1756 (KU, dupl. spec. orig. *V. montanæ* GLEASON).

An interesting species apparently not rare in the higher mountains of Hispaniola. The specimens cited above agree exactly with each other and with the type of *Proustia domingensis* SPR. in the Prodromus Herbarium. The type specimen of *Lepidaploa buxifolia* CASS. has not been seen. The good description of CASSINI agrees perfectly with the species as here understood.

GLEASON in his »Revision» and in his »Studies» evidently has another plant in mind when describing *V. buxifolia*. The characteristics »Achenes pubescent; outer pappus conspicuous, its scales much broader than the white bristles of the inner series» (GLEASON, 1913, p. 327) clearly do not apply to our *V. buxifolia*, of which CASSINI says: »Les ovaires sont glabres...leur aigrette est roussâtre, double: l'extérieur courte, peu distincte, composée de squamellules inégales, filiformes-laminées, subulées, denticulées». Which species GLEASON has in mind, I cannot decide; most probably it is a new one. He has, however, genuine *V. buxifolia* (CASS.) LESS. at hand, but describes it as a new species, *V. montana* GLEASON.

Vernonia Tuereckheimii URB.

Tabula nostra I, fig. 10 (pars inflorescentiæ).

Vernonia Tuereckheimii URBAN, 1912, p. 421; GLEASON, 1913, p. 327.

Pappi setæ interiores persistentes, numero 65, rigidulæ, crassiusculæ, paullulo complanatæ, stramineo-purpurascennes, quam exteriores inæquales, parum conspicuæ circ. 8-plo longiores. Corolla 7 mm longa, tubo amplo, glabro long. $\frac{2}{3}$ corollæ, limbi laciniis apice subtus papillois, ceterum glabris. Antheræ 2,5—2,8 mm longæ, ligula longa, $\frac{1}{3}$ long. antheræ, auriculis brevissime apiculatis.

Hab. in Hispaniola: Constanza, in declivibus pineti aridis, alt. 1250 m, mense Febr. 1910, TÜRCKHEIM n. 2959 (D, KU, M).

A very characteristic species, easily recognized by the purple-tinged involucre and pappus. The description given by URBAN is excellent.

Subsect. **Graciles.**

Suffrutices vel frutices humiles. Folia membranacea, forma et pubescentia varia. Inflorescentia cymoso-scorpioidea, cymis elongatis, sæpissime cauliformibus, calathidiis axillaribus, sessilibus, sæpe geminatis; bracteis foliaceis, calathidiis longioribus. Calathidia parva. Involucrum campanulatum, squamis sæpe longe vel longissime mucronatis. Receptaculum planum, subnudum. Pappi setæ interiores persistentes, tenues, albidæ, exteriores distinctæ. Corolla vulgo 6 mm longa, limbi laciniis dorso laxè pilosis. Antheræ circ. 2 mm longæ. Achænia tenuiter appressopubescentia.

A very natural subsection closely related to the *Arborescentes*, and chiefly distinguished by the pubescence of the clefts of corolla, further by the characteristics of the inflorescence and the involucre. The range of the subsection extends from Columbia to eastern Brazil. Well-known species belonging here are *V. gracilis* H. B. K., *V. Cotoneaster* (W.) LESS., *V. Salzmannii* DC. (not BAKER in Fl. Bras.), *V. araripensis* GARDN., *V. acutangula* GARDN., *V. tricephala*

GARDN., etc. Two species have been found in the West Indies, viz. *V. gracilis* H. B. K. and *V. tricephala* GARDN., both in the extreme south-eastern part of the region.

Conspectus specierum hujus subsectionis.

I. Calathidia in axillis solitaria vel gemina. Squamæ involucri in mucronem plus minusve elongatum, sæpe recurvatum subito contractæ. — Bequia.

V. gracilis H. B. K.

II. Calathidia in axillis vulgo plura, 2—4. Squamæ involucri acutissimæ, in mucronem rectum sensim attenuatæ. — Trinidad.

V. tricephala GARDN.

***Vernonia gracilis* H. B. K.**

Vernonia gracilis HUMBOLDT, BONPLAND, KUNTH, 1820, p. 34; LESSING, 1829, p. 302; 1831, p. 667 (excl. var. *villosa*), DE CANDOLLE, 1836, p. 49; SCHULTZ-BIPONTINUS, 1847, p. 511; BAKER, 1873, p. 81 (quoad typum!).

Vernonia elongata WILLDENOW in sched. ap. LESSING, 1829, p. 302.

Vernonia Moritziana SCHULTZ-BIPONTINUS, 1847, p. 511.

Cacalia gracilis KUNTZE, 1891, p. 970.

Cacalia Moritziana KUNTZE, 1891, p. 970.

Hab. in Columbia.

subsp. *tomentosa* EKMAN n. subsp.

A specie differt præsertim foliis discoloribus, subtus tomento floccoso instructis.

Vernonia Cotoneaster (W.) LESS. var. *angustifolia* HIERONYMUS, 1901, p. 559.

Vernonia Cotoneaster (W.) LESS. var. *pungens* HIERONYMUS in sched. herb. Berol.

Pappi setæ interiores persistentes, numero circ. 25, tenues, filiformes, albidæ, quam exteriores 7-plo longiores. Corolla 6 mm longa, glabra, tubo superne dilatato $\frac{2}{3}$ long. corollæ, limbi laciniis dorso pilis longis instructis. Anthæræ 2,7 mm longæ, ligula $\frac{1}{3}$ long. antheræ, subnervi, auriculis subito contractis.

Hab. in Bequia: in collibus inter frutices, alt. 150—300 m, Maj. 1889, JOSEPH DALTON et H. H. SMITH n. B. 288 (K, orig. spec. subspeciei). — Insuper in Columbia.

Vernonia gracilis H. B. K. is a plant common in the dry plains of Columbia. Like all Vernoniæ it is highly variable, especially as to the pubescence of the leaves and the length of the subulate tips of the scales. *V. Moritziana* SCH.-BIP. was described upon a form with very short tips. The genuine *V. gracilis* has leaves nearly glabrous beneath. I have based the new subspecies upon specimens having the leaves densely floccose-tomentose beneath. Just because of this pubescence HIERONYMUS took the same plant to be *V. Cotoneaster* (W.) LESS., a species from Bahia, differing from *V. gracilis* in its smaller involucre. The material at hand of the subspecies is too meagre to give a reliable idea of its systematic rank; perhaps it is a distinct species.

It is puzzling that *V. gracilis* subsp. *tomentosa* has been found to occur in Bequia, far away from its proper region, which is Columbia.

Vernonia tricephala GARDN.

Tabula nostra VI, fig. 5 (cyma).

Vernonia gracilis H. B. K. var. *villosa* LESSING, 1829, p. 303; DE CANDOLLE, 1836, p. 50.

Vernonia tricephala GARDNER, 1846, p. 223; BAKER, 1873, p. 68.

Vernonia tricholepis GRISEBACH, 1861, p. 354, p. p. — non DC.

Cacalia tricephala KUNTZE, 1891, p. 971.

Pappi setæ interiores persistentes, numero 30, tenues, filiformes, albidæ, quam exteriores distinctæ circ. 4-plo longiores. Corolla 5 mm longa, tubo sensim dilatato long. $\frac{2}{3}$ corollæ, glandulis nonnullis obsito, limbi laciniis dorso pilis longis et glandulis globuliformibus instructis. Antheræ 2 mm longæ, ligula $\frac{1}{5}$ long. antheræ, auriculis acutis.

Hab. in Trinidad: CRUEGER, sine loco acc. (G); Cedros, loco sicco, 15. 1. 08, BROADWAY n. 2174 (DC, KU).

Specimens from Trinidad agree exactly with the genuine *V. tricephala* from Brazil.

GRISEBACH cites, 1861, p. 354, two West Indian plants as belonging to *V. tricholepis* DC. Neither of them belongs to that species, the former, Jamaica, PURDIE, being *V. sericea* L. C. RICH., certainly not collected in Jamaica, the second is just *V. tricephala* GARDN.

Subsect. *Arborescentes*.

Frutices vel suffrutices. Folia membranacea, rarius subcoriacea, forma et pubescentia varia. Inflorescentia cymoso-scorpioidea, cymis elongatis vel in speciebus nonnullis abbreviatis; bracteis evolutis, foliaceis. Calathidia mediocria—parvula. Receptaculum planum, subnudum. Involucrum vulgo late campanulatum, interdum cylindricum aut late infundibuliforme. Pappi setæ interiores persistentes aut subdeciduæ, numero 20—50, tenues aut crassiusculæ, quam exteriores distinctæ 5—15-plo longiores. Corolla 5—10 mm longa, glabra; tubo long. $\frac{1}{2}$ — $\frac{3}{4}$ corollæ, extus interdum glandulis brevibus nonnullis instructo; limbi laciniis apice subtus papillois, raro ipso apice pilis nonnullis munitis. Antheræ 0,8—2,8, raro 3,2 mm longæ, ligula long. $\frac{1}{6}$ — $\frac{1}{8}$ antheræ, auriculis obtusis aut acutis. Achænium sericeo-pubescentis.

The subsection *Arborescentes* as here conceived includes species of very different habits. It matches GLEASON's *Scorpioideæ foliatæ*, his smaller groups *Fruticosæ* and *Schiedeanæ* excluded. Some of his *Scorpioideæ aggregatæ* also belong here, like all his *Scorpioideæ reductæ*. It may be, however, that the subsection, as here defined, is not quite monophyletic. One of the species referred to it, namely *V. Trinitatis* EKMAN, differs somewhat in habit from the genuine *Arborescentes*, and is strongly allied to some Mexican and South American species. I have tried to distinguish it by floral characters from the *Arborescentes*, but in vain. Probably it is, like some of its allies, an annual plant, differing as to that respect from the *Arborescentes*; but I have no evidence for this supposition.

In fact, as easy as it is to distinguish the *Arborescentes* from other West Indian subsections, as difficult is it to determine where the line between the subsection and some South American species is to be drawn. As far south as the Argentine province of Corrientes, species occur strongly recalling the *Arborescentes* in habit. I am firmly convinced that numbers of species from South America are to be referred in future to this subsection.

With this I have stated that the *Arborescentes* have their nearest allies in South America, and probably the subsection

has its origin there, though in the West Indies showing a particular and independent evolution.

Within the vast assemblage of species constituting the *Arborescentes* smaller groups can be distinguished. They do not appear as sharply definable taxonomic units, the existence of which could not be denied; on the contrary, they are but vaguely indicated, and very difficult to characterize. Subjective susceptibility may also play some part in the perception of these delicate taxonomic sensations. However, considering every method of arranging species according to their natural relationships preferable to an artificial arrangement, I have tried to give an exposition of the *Arborescentes* based on their supposed relationships. The species have been arranged according to characters about the value of which for recognizing groups in *Vernonia* very little is known, such as consistence and relative length of the pappus, pubescence of the corolla, length of the anthers etc. Or, *mutatis mutandis*, the groups recognized have been found to differ in those points. Now such characters are not convenient for identifying specimens the names of which are required. I have, therefore, given an artificial key in order to facilitate such identifications.

The smaller groups concerned have not been named. They are based upon too small a material and are, as already stated, too vaguely indicated to deserve that certificate of taxonomic importance which a name betokens. However, a few words upon their characteristic features and their geographical ranges may be advisable.

1. The allies of *V. argyropappa* BUEK.

One species of Trinidad. As already mentioned it approaches very nearly to certain Mexican and South American species, the best known of which is *V. argyropappa* BUEK. Another member of this group is the widely distributed, annual *V. remotiflora* L. C. RICH. By their floral characters these species cannot be distinguished from the allies of *V. arborescens* (L.) Sw. The differences are chiefly habitual ones, such as larger involucre, subulate, spreading scales, the outer of which are slightly recurved, etc.

The striking resemblance between *V. Trinitatis* and *V. arborescens* has made me believe that the latter has taken its origin from *V. Trinitatis* or from some species nearly allied

to this. This presumption is clearly supported by the geographical distribution of the species in question.

2. The allies of *V. arborescens* (L.) Sw.

Three species, *V. arborescens* (L.) Sw., *V. albicaulis* PERS., and *V. borinquensis* URB. They are all shrubs, much branched and rather tall. The inflorescence is many-flowered, spreading or somewhat congested, especially so in *V. albicaulis*. The corolla is glabrous, in rare cases with a few short hairs at the tips of the clefts. The bristles of the inner series of pappus are fine, yet persistent, and five to seven times longer than those of the outer one. The anthers are rather large, about 2,5 mm long.

The geographical range of this group extends from the island of Margarita near the coast of Venezuela over the Lesser Antilles up to Porto Rico. *V. arborescens* is, may be, the primitive type of the group, being confined to the Windward Islands. From it *V. albicaulis* can be derived directly, structurally and geographically, occupying the Leeward Islands and Porto Rico. *V. borinquensis* I suppose to be a more recent offshoot from *V. arborescens*.

3. The allies of *V. bahamensis* GRISEB.

Three species of the Bahamas, *V. bahamensis* GRISEB., *V. arbuscula* LESS., *V. obcordata* GLEASON, and one species from eastern Cuba, *V. complicata* GRISEB. They are distinguished from *V. arborescens* and its allies by the dense tomentum of their leaves and branches and by the highly reduced inflorescence. The three Bahaman species (at least two of them) are, besides, characterized by the existence of a few long hairs at the tips of the clefts of corolla; in *V. complicata* these hairs are lacking. The group can be derived directly from *V. albicaulis*. The Cuban species evidently derives its origin from the Bahamas, and is to be looked upon as the most recent offshoot of the *Arborescens-Bahamensis*-branch.

4. The allies of *V. fruticosa* Sw.

Five species of Jamaica, *V. divaricata* Sw., *V. acuminata* LESS., *V. expansa* GLEASON, *V. pluvialis* GLEASON and *V. rigida* Sw., one species of south-western Hispaniola, *V. fruticosa* (L.) Sw., and four little-known species of eastern Cuba, *V. parvuliceps* EKMAN, *V. yunquensis* GLEASON, *V. leptoclada* SCH.-BIP. and *V. pineticola* GLEASON. They are distinguished from *V. arborescens* and its allies by the broader

inner bristles of the pappus, which are somewhat caducous, and by the shorter anthers. The Jamaican species differ from the other ones in having the leaves not whitened beneath.

In his »Studies» GLEASON describes four new species from Cuba, *V. calophylla*, *V. vicina*, *V. calida* and *V. semitalis*, which are all to be placed here.

As well as *V. arborescens* (L.) Sw. could be originated from *V. Trinitatis* EKMAN, *V. divaricata* has its nearest relative in *V. canescens* H. B. K. of Venezuela. In habit the two species are strongly alike. The most characteristic feature of *V. canescens*, the want of bracts below most of the heads, is to be seen unaltered in *V. divaricata*.

5. The allies of *V. membranacea* GRISEB.

Three species of Cuba, *V. membranacea* GRISEB., *V. crassinervia* WRIGHT ap. GLEASON and *V. gnaphalifolia* A. RICH. They differ from the other *Arborescentes* in having very short outer bristles of the pappus, only $\frac{1}{10}$ — $\frac{1}{15}$ in length of the inner bristles. A newly described species from Cuba, *V. desiliens* GLEASON, is to be placed here.

The allies of *V. membranacea* closely approach to the allies of *V. sericea* L. C. RICH. I do not know whether they have any near relative in South America.

6. The allies of *V. sericea* L. C. RICH.

Three species of Cuba, two of which are known to me, *V. angustissima* WRIGHT. ap. EKMAN and *V. commutata* EKMAN, the third, *V. corallophila* recently described by GLEASON, one species of Hispaniola, *V. stenophylla* LESS., and one species of Porto Rico, St. Croix, St. Thomas and St. Jan, *V. sericea* L. C. RICH., with a subspecies in Hispaniola. The species in question are characterized by the shape of their involucres, their small anthers and their, as a rule, narrow leaves.

7. The allies of *V. segregata* GLEASON.

One isolated species of Cuba, of puzzling habit and mysterious affinities.

As mentioned above, two keys to the species of the subsection *Arborescentes* are appended. The first shows the natural relationships of the species. In this key, of course, I have not given the species recently described by GLEASON, having not seen his species, nor having analyzed their

flowers and pappus. The second key is based on more superficial characters, and in this the species of GLEASON have been inserted.

Conspectus specierum hujus subsectionis.

- I. Herbæ verisimiliter annuæ, sæpe elatæ. Calathidia majuscula, ad 10 mm longa. Squamæ involucri acutissimæ, subulatæ, exteriores sæpe patentes—recurvatæ. — Species *V. argyropappæ* BUEK proximæ, habitu plus quam characteribus distinctæ, in America australi a Mexico usque ad Rio de Janeiro et Paraguay divulgatæ, una in Trinidad.
V. Trinitatis EKMAN.
- II. Frutices vel suffrutices perennes, sed sæpe jam primo anno florentes. Calathidia vulgo minora, ad 8 mm longa. Squamæ exteriores rarius subulatæ, vulgo acutæ—obtusæ, sæpissime erectæ, appressæ, strictæ. — Species antillanæ.
 - A. Frutices vel suffrutices et inferne sæpe ramosi. Folia lata forma variabili. Involucrum campanulatum aut subcylindricum. Squamæ involucri etiam interiores imbricatæ. Antheræ majusculæ, sæpe 2—3 mm longæ.
 1. Pappi setæ interiores exterioribus 6—8-plo longiores.
 - a. Pappi setæ interiores persistentes, tenues. Antheræ majores, circ. 2,5 mm longæ.
 - α. Frutices plus minus elati, modice pubescentes. Inflorescentia satis ampla, cymis vulgo multifloris. — Species *V. arborescenti* (L.) Sw. proximæ, in Antillis minoribus nec non in Porto Rico vigentes.
 - † Folia membranacea. Cymæ rectæ vel curvatæ, haud flexuosæ. Pappus albus aut sordide stramineus.
 - × Squamæ involucri elongatæ, lineares, satis laxæ, patulæ, exteriores subrecurvatæ. Pappus albus. Antheræ auriculis apice brevissime acuminatis. — In insulis ad ventum frequens.
 - V. arborescens* (L.) Sw.
 - ×× Squamæ involucri breviores, lineari-deltaideæ, omnes erecto-appressæ. Pap-

pus sæpe sordide stramineus. Antheræ auriculis longe acutatis. — Species quam maxime variabilis, in insulis infra ventum nec non in Porto Rico frequens. *V. albicaulis* PERS.

(cfr. etiam *V. albicaulis* PERS. × *sericea* L. C. RICH.)

†† Folia pergamacea. Cymæ flexuosæ, rigidæ. Pappus brunneus. — Porto Rico.

V. borinquensis URB.

β. Frutices humiles, copiose tomentosi. Inflorescentia reducta, cymis uni—paucifloris. — Species *V. bahamensi* GRISEB. proximæ, in insulis Bahamensibus vigentes, una Cubensis.

† Folia margine plana, tomento densissime appresso. Limbi lacinii ipso apice pilis nonnullis longis muniti. — Insulæ Bahamenses.

× Folia basi longe attenuata, supra medium latissima.

* Folia anguste obovata, apice breviter acuminata vel rotundata.

V. bahamensis GRISEB.

** Folia late obcordata, apice emarginato-incisa.

V. obcordata GLEASON.

×× Folia basi rotundata vel breviter attenuata, fere ad medium latissima.

V. arbuscula LESS.

†† Folia margine grosse plicato-undulata, tomento denso, haud appresso. Limbi lacinii ipsa apice papilloso, pili desunt. — Cuba.

V. complicata GRISEB.

b. Pappi setæ interiores subdeciduæ, crassiusculæ, paullulo complanatæ. Antheræ minores, vix 2 mm longæ. — Species *V. fruticosæ* Sw. proximæ, in Antillis majoribus vigentes.

α. Folia concoloria. — Species Jamaicenses.

† Squamæ involucri interiores purpurascens. Pappus albus. *V. divaricata* Sw.

†† Squamæ involucri brunneæ. Pappus sæpissime brunneus.

× Rami tenuiter puberuli. Cymæ inflorescentiam distinctam formantes. Involucrum campanulatum, aut cylindricum.

* Folia membranacea, elliptica, acuminata, breviter sed distincte petiolata. Inflorescentia satis ampla. Involucrum breviter campanulatum, squamis 4—5-seriatis, satis brevibus, vix carinatis. Corollæ tubus long. $\frac{3}{5}$ corollæ.

αα. Calathidia in cymis laxè disposita. Involucrum circ. 5 mm longum. Corollæ 6—6,5 mm longæ tubus gracilis superne in limbum subito abiens. *V. acuminata* LESS.

ββ. Calathidia in cymis satis approximata. Involucrum circ. 4 mm longum. Corollæ 5 mm longæ tubus amplior superne in limbum sensim abiens.

V. expansa GLEASON.

** Folia pergamacea, acuta, subsessilia, obsolete denticulata. Inflorescentia valde congesta. Involucrum elongatum, cylindricum, squamis 6—7-seriatis, elongatis, dorso carinatis. Corollæ tubus long. vix $\frac{1}{2}$ corollæ.

V. pluvialis GLEASON.

×× Rami juveniles dense tomentosi. Cymæ elongatæ, flexuosæ, inflorescentiam distinctam vix formantes. Involucrum infundibuliforme, basi cuneatum, squamis multiseriatis, exterioribus valde imbricatis, interioribus fructus tempore elongatis, patentissimis. *V. rigida* Sw.

β. Folia discoloria. — Species insularum Hispaniola et Cuba incolæ.

† Folia plana.

× Folia subtus laxius floccoso-tomentosa. Cymæ elongatæ, sæpe cauliformes. — Hispaniola. *V. fruticosa* (L.) Sw.

×× Folia subtus densissime appresso-tomentosa. Inflorescentia congesta. — Cuba.

* Folia lanceolata. Inflorescentia cymis multifloris, arcuatis constans, calathidiis perapproximatis, parvis, 5 mm longis. *V. parvuliceps* EKMAN.

** Folia ovata. Inflorescentia valde congesta. Calathidia majora, 10 mm longa. *V. yunquensis* GLEASON.

†† Folia valde rugosa. — Cuba.

× Involucrum 5 mm longum, squamis breviter acutis, imbricatis.

V. leptoclada SCH.-BIP.

×× Involucrum ad 12 mm longum, squamis rigidis, patulis, longissime acutatis.

V. pineticola GLEASON.

2. Pappi setæ interiores persistentes, tenues, quam exteriores 10—15-plo longiores. — Species *V. membranaceæ* GRISEB. proximæ, in insula Cuba vigentes.

a. Folia concoloria, subtus laxè puberula.

V. membranaceæ GRISEB.

b. Folia subtus densius tomentosa, novella saltem discoloria.

α. Folia adulta concoloria, breviter acuta. Suffrutex humilis, 1,5 dm altus. Inflorescentia depauperata, cymis paucifloris.

V. crassinervia WRIGHT ap. GLEASON.

β. Folia etiam adulta discoloria, obtusa. Suffrutex elatior, inflorescentia amplior, cymis satis multifloris.

V. gnaphalifolia A. RICH.

B. Suffrutices inferne simplices. Folia angusta, lanceolata vel linearia, in *V. sericea* L. C. RICH. tamen vulgo latiora. Involucrum late infundibuliforme. Squamæ involucri interiores sublaxæ, omnes acutæ—acutissimæ. Pappi setæ interiores persistentes, tenues, exterioribus 8—10-plo longiores. Antheræ minimæ—minutæ. — Species *V. sericeæ* L. C. RICH. proximæ, in insulis Cuba—Hispaniola—Porto Rico—St. Jan vigentes.

1. Folia concoloria. — Cuba. *V. commutata* EKMAN.

2. Folia subtus sericeo-pubescentia—sericeo-tomentosa.
- a. Folia linearia, margine revoluta (cfr. *V. sericea* subsp.). Calathidia 18—21-flora. Pappus albus.
- α. Inflorescentia divaricata. Squamæ involucri submolles. Tubus long. $\frac{3}{4}$ corollæ. — Cuba.
V. angustissima WRIGHT ap. EKMAN.
- β. Inflorescentia congesta, angusta. Squamæ involucri rigidæ. Tubus long. $\frac{1}{2}$ corollæ. — Hispaniola.
V. stenophylla LESS.
- b. Folia latiora, vulgo anguste ovato-lanceolata. Calathidia 11—16-flora. Pappus sæpissime brunneus.
- α. Calathidia 11—13-flora.
- † Folia subtus sæpe tenuissime sericea. Inflorescentia satis contracta. Squamæ involucri interiores sæpe breviter acutatae. Antheræ 1,2 mm longæ. — Hispaniola.
V. sericea L. C. RICH. subsp.
racemosa (DELP.). EKMAN.
- †† Folia subtus densius sericeo-tomentosa. Inflorescentia diffusa, cymis elongatis. Squamæ involucri interiores acutæ. Antheræ minimæ, 0,8 mm longæ. — Porto Rico — Ins. infra ventum. *V. sericea* L. C. RICH.
- β. Calathidia 15—16-flora. — Porto Rico—Insulæ infra ventum. $\asymp$ *V. Gleasonii* EKMAN.

Artificial Key to the Species of the Subsect. Arborescentes.

I. Leaves linear to narrowly linear-lanceolate.

A. Pappus white.

1. Leaves greenish beneath. — Cuba. *V. commutata*.

2. Leaves whitened beneath.

a. Leaves revolute, sericeous beneath.

α. Inflorescence spreading. — Cuba.

V. angustissima.

β. Inflorescence contracted, narrowly oblong.

† Leaves 4—7 cm long; heads 18—21-flowered. — Hispaniola. *V. stenophylla*.

†† Leaves 1—3 cm long; heads 11-flowered. — Cuba. *V. corollaphila*.

b. Leaves flat, tomentose beneath. — Cuba.

V. gnaphalifolia var. *angustata*.

B. Pappus brown. — Hispaniola.

V. sericea subsp. *racemosa*.

II. Leaves broadly lanceolate to rounded.

A. Inflorescence many-flowered, cymes elongated.

1. Leaves greenish beneath, glabrous or pubescent.

a. Pappus brown or tawny.

α. Scales bluntish.

† Leaves coriaceous. Involucres obconic.
— Jamaica. *V. rigida*.

†† Leaves membranaceous. Involucres campanulate or cylindric.

× Involucres cylindric. — Jamaica.

V. pluvialis.

×× Involucres campanulate.

* Scales not margined.

αα. Involucres brown, 5 mm high.
— Jamaica. *V. acuminata*.

ββ. Involucres greenish-brown, 4 mm high. — Jamaica.

V. expansa.

** Scales margined. — Cuba.

V. membranacea.

β. Scales acute.

† Inflorescence contracted, cymes straight.
— Porto Rico—Leeward Islands.

V. albicaulis.

†† Inflorescence spreading.

× Cymes flexuose. — Porto Rico.

V. borinquensis.

×× Cymes straight.

* Heads 11—13-flowered. Inner scales somewhat bluntish. — Hispaniola. *V. sericea* subsp. *racemosa*.

** Heads 15—16-flowered. Inner scales acute. — Porto Rico—Leeward Islands. $\asymp$ *V. Gleasonii*.

b. Pappus white.

α. Scales loose, somewhat spreading, outer ones often slightly recurved.

- † Outer scales elongated, subfiliform. —
Trinidad. *V. Trinitatis*.
- †† Outer scales linear-lanceolate, acute. —
Windward Islands, Margarita. *V. arborescens*.
- β. Scales appressed, imbricated.
 - † Cymes flexuose. — Jamaica. *V. acuminata* var.
 - †† Cymes straight.
 - × Inner scales somewhat bluntish, often
purplish. — Jamaica, Grand Cayman. *V. divaricata*.
 - ×× Inner scales acute, never purplish. —
Porto Rico—Leeward Islands. *V. albicaulis*.
- 2. Leaves whitened, or at least densely tomentose
beneath.
 - a. Pappus brown.
 - α. Leaves sericeous beneath. Scales acute.
 - † Heads 11—13-flowered. — Hispaniola—
Leeward Islands. *V. sericea*.
 - †† Heads 15—16-flowered. — Porto Rico—
Leeward Islands. *≈ V. Gleasonii*.
 - β. Leaves tomentose beneath. Scales obtuse.
— Cuba. *V. desiliens*.
 - b. Pappus white.
 - α. Leaves flat.
 - † Leaves loosely tomentose beneath.
 - × Cymes many-headed, often elongated.
 - * Inner scales often purplish. — Ja-
maica, Grand Cayman. *V. divaricata*.
 - ** Inner scales never purplish. — His-
paniola *V. fruticosa*.
 - ×× Cymes few-headed, often abbreviated.
 - * Leaves acute, only the younger ones
whitened beneath. — Cuba. *V. crassinervia*.
 - ** Leaves obtuse, all whitened beneath.
— Cuba. *V. gnaphalifolia*.
 - †† Leaves densely tomentose beneath.

× Leaves rounded or obtuse at the apex.
Straggling plant. — Cuba.

V. calophylla.

×× Leaves acute. Erect plants.

* Leaves elliptic to elliptic oblong. Involucres 5—6 mm high. — Cuba.

V. vicina.

** Leaves broadly lanceolate. Involucres 3 mm high. — Cuba.

V. parvuliceps.

β. Leaves bullate.

† Leaves acute. Cymes elongated.

× Involucres to 12 mm high, scales with filiform tips. — Cuba. *V. pineticola.*

×× Involucres 5 mm high, scales lanceolate, acute. — Cuba. *V. leptoclada.*

†† Leaves obtuse or rounded. Cymes abbreviated.

× Involucre densely pubescent. — Cuba.

V. calida.

×× Involucre thinly pubescent, or glabrate.

— Cuba. *V. semitalis.*

B. Inflorescence few-headed, cymes reduced, or forming terminal capitate clusters.

1. Inflorescence of reduced cymes.

a. Leaves flat.

α. Leaves narrowed at the base, broadest above the middle.

† Leaves narrowly obovate, rounded at the apex. — South-eastern Bahama Islands.

V. bahamensis.

†† Leaves broadly obcordate, emarginated at the apex. — Little Inagua Island, Bahamas.

V. obcordata.

β. Leaves rounded at the base, or shortly attenuated, broadest near the middle. — New Providence Island, Andros Island, Bahamas.

V. arbuscula.

b. Leaves undulate or curled towards the margins.
— Cuba.

V. complicata.

2. Inflorescence of capitate clusters.

a. Pappus brown. — Jamaica. *V. pluvialis.*

b. Pappus white.

 α . Leaves densely tomentose beneath. A single terminal cluster of heads. — Cuba.*V. yunquensis.* β . Leaves finely pubescent beneath. Clusters of heads both terminal and axillar. — Cuba.*V. segregata.*1. The allies of *Vernonia argyropappa* BUEK.*Vernonia Trinitatis* EKMAN n. sp.

Suffrutex elatus, certe metralis et ultra. Caulis (cujus pars superior tantum adest) erectus, inferne lignosus, diam. 4,5 mm, simplex, superne ramosus, teres, striatus, inferne subglaber, cortice pallide avellaneo, superne densiuscule pubescens, inferne nudus, apice foliatus. Folia alterna, patentia, subsessilia vel brevissime petiolata, petiolo ad 2 mm longo, tomentello, complanato; laminæ anguste ovatae, ad 13 cm longæ, 6 cm latæ, infra medium latissimæ, basi late rotundatæ, apice longe acuminato-acutissimæ, membranaceæ, planæ, integræ vel remote denticulatæ, supra olivaceo-virides, subglabræ, sublæves, subtus pube molli, subappressa, subvelutina, rufo-grisea instructæ, costa nervisque utriusque lateris numero 8, supra impressis, subtus exculptis, nervulis obsoletis. Inflorescentia cymoso-scorpioidea, ampla, ambitu obpyramidata, ad 3 dm longa, 2,5 dm lata, diffusa, cymis elongatis, patulis, sursum arcuatis, simplicibus vel ramis nonnullis brevibus instructis, circ. 15-cephalis, calathidiis inferioribus spatio ad 3,5 cm longo disjunctis, superioribus magis approximatis, omnibus bracteis suffultis foliaceis, iis multoties longioribus. Calathidia axillaria, sessilia, solitaria vel sæpe geminata, circ. 25-flora. Involucrum infundibuliformi-campanulatum, 8 mm altum et totidem fere latum, squamis circ. 5-seriatis, extimis ceteris dimidio brevioribus, lineari-subulatis, subpungentibus, patulis, apice subrecurvis, intermediis inferne anguste oblongis, infra medium in subulam longam, patulam, subrecurvam abeuntibus, pulchre carinatis, intimis lineari-ligulatis, breviter acutatis, omnibus

pubescentibus, sordide griseo-viridibus, intimis superne pallide brunneis. Receptaculum planum, nudum. Pappi setæ interiores persistentes, numero 35, tenues, filiformes, albidæ, 5,5 mm longæ, quam exteriores æquilongæ, distinctæ circ. 8-plo longiores. Corolla 8 mm longa, glabra, tubo $\frac{2}{3}$ longitudine corollæ. Antheræ 2,8 mm longæ, ligula $\frac{1}{5}$ long. antheræ, nervo subdistincto, auriculis obtusiusculis. Achænia (valde immatura) cylindrica, appresse sericeo-pubescentia, costis subconspicuis.

Hab. in Trinidad: LOCKHART (K); »E reliquis CRUEGER., PURD. etc. arranged by I. H. HART a. 1888», n. 2036 (KU, orig. spec.).

The description of this new species has been made from the specimens of the KRUG-URBAN Herbarium. The plant collected by LOCKHART is very badly preserved, nearly all heads being discharged, without bracteal leaves. Its leaves are somewhat larger than those of the type specimen, 15 cm long by 7 cm wide; otherwise it agrees well with it.

V. Trinitatis belongs to a little group of species very nearly related to each other. The best known of these species is *V. argyropappa* BUEK (= *V. Poeppigiana* DC. Prodr. p. 55, not *V. Poeppigiana* DC. Prodr. p. 20. DE CANDOLLE in his Prodrômus described two *V. Poeppigianæ*. BUEK, having observed the fault, nullified the name of the second species, calling it *V. argyropappa*. This name should be retained for the species, even though the first *V. Poeppigiana* is now referred to *Piptocarpha*). The other species of the group are *V. Miersiana* GARDN. from eastern Brazil (= *V. Salzmannii* BAKER in Fl. Bras., not *V. Salzmannii* DC.), *V. virens* SCH.-BIP. from Central Brazil, *V. hirsutivena* GLEASON from Yucatan, and two not published species, *V. Friedrichsthali* SCH.-BIP. mscr. from Guatemala—Columbia and *V. strigosa* SCH.-BIP. mscr. from Mexico. The species in question are, in fact, very closely related, and might be united into one single, though extraordinarily variable, species. However, I prefer not to do so. They look, after all, rather dissimilar, they are easily characterized, and they have, moreover, their particular geographical ranges. The following key gives their characteristics.

I. Outer scales very long-cuspidate.

A. Leaves rounded at base, velvety-pubescent beneath.

— Trinidad.

V. Trinitatis.

- B. Leaves narrowed at base, strigose-pubescent beneath.
— Guatemala—Columbia. *V. Friedrichsthalii*.
- II. Outer scales not at all, or shortly, cuspidate.
- A. Leaves broad, elliptical, conspicuously narrowed at base.
1. Leaves velvety-pubescent beneath, especially on the veins. — Yucatan. *V. hirsutivena*.
 2. Leaves strigose-pubescent beneath. — Central Brazil. *V. virens*.
- B. Leaves narrowly oblong to narrowly lanceolate, shortly narrowed at base.
1. Inner scales beautifully purplish, involucre 8—10 mm high. — Mexico. *V. strigosa*.
 2. Inner scales not purplish.
 - α. Heads distant, involucre about 7 mm high, scales densely imbricated. — Peru. *V. argyropappa*.
 - β. Heads approximated, about 6 mm high; scales loosely imbricated. — Eastern Brazil. *V. Miersiana*.

Besides this, there are well-marked differences in the structure of the flowers and the pappus. However, I have had a rather scanty material to examine, and the differences found thus cannot be published here.

The names *V. Friedrichsthalii* and *V. strigosa* are not to be considered as published in this paper.

From *V. Trinitatis*, or some closely related species, *V. arborescens* (L.) Sw. may have originated. Especially the specimen collected by LOCKHART greatly resembles this species.

2. The allies of *Vernonia arborescens* (L.) Sw.

Vernonia arborescens (L.) Sw.

Tabula nostra II, fig. 1 (cyma).

Conyza arborescens LINNÆUS, 1759 a, p. 1213; 1763, p. 1209, excl. syn. BROWNEI et SLOANEI.

Vernonia arborescens SWARTZ, 1806, p. 1320, quoad typum LINNÆI, haud quoad descript., nec patriam.

Lepidaploa arborescens »CASS.» ap. LESSING, 1829, p. 302 (ap. CASSINI 1823, nomen non inveni), quoad typum LINNÆI.

Vernonia divaricata LESSING, 1829, p. 306 — non Sw.

Vernonia icosantha DE CANDOLLE, 1836, p. 49; GLEASON, 1906 b, p. 178.

Vernonia arborescens Sw. var. *divaricata* GRISEBACH, 1861, p. 353.

Cacalia arborescens KUNTZE, 1891, p. 323, quoad typum LINNÆI.

Vernonia ventosa GLEASON, 1906 b, p. 179.

Eupatorium arborescens, floribus cæruleis. PLUM. Cat. pl. Amer., p. 10.

Conyza foliis ovatis sessilibus acuminatis floribus ramulorum axillaribus sessilibus solitariis. PLUM. ed. BURM., p. 122. — Tab. 130, fig. 2.

Pappi setæ interiores persistentes, numero 30, tenues, filiformes, albidæ, exterioribus distinctis 5—6-plo longiores. Corolla 7—8,5 mm longa, glabra, tubo long. $\frac{1}{2}$ corollæ, limbi laciniis apice subtus papillois, interdum pilis nonnullis brevibus instructis. Antheræ 2,5—2,8 mm longæ, ligula long. $\frac{1}{6}$ antheræ, auriculis breviter acuminatis.

Hab. in Cuba: Havana, verisimiliter culta, DE LA OSSA, anno 1825 (Prodr). — Martinique: Herb. SURIAN, fasc. 2, n. 198 (P, orig. spec.); Herb. JUSSIEU, coll. haud not. (P); ex Herb. VAILLANT, coll. haud not. (P); ROHR (H, S); «in caribæis frequens», L. C. RICHARD (P, sub nom. *Serratula solidaginoides*); ISERT (H); WEST (Prodr, S); FORSSTRÖM (S); F. KOHAUT in SIEBER, Fl. Martin. n. 190 (B, Bss, M, P, S), Fl. Martin. n. 419 (D); PLÉE (P, «commune à la Martinique, en 5. Mai 1820», «il est très commun à la Martinique où il est connu sous le nom de Bois moëlle»); DUPERREY (P); M^{me} RIVIERE (P); «en abondance sur les mornes qui entourent le Fort Bourbon», April. 1839, A. STEINHEIL (P); «près du chemin au Morne Rouge», 8. 5. 39, A. STEINHEIL n. 137 (P); PERROTTET (D); «mornes à l'Est de Saint Pierre», Maj. 1853, BÉLANGER n. 155 (D, F); BÉLANGER n. 226 (BB), n. 394 (P); mense Mart. 1856, CRUEGER (?K); «troisième port, champs incultés», Nov. 1867, HAHN n. 569 (B, BB, D, DC, K, P); HAHN n. 925 (BB, DC, P); HAHN, anno 1870 (K); anno 1890, leg. DUSS n. 303, 304, 305, 931, 984 (KU); ad viam inter St. Pierre et Morne Rouge, alt. 25—500 m, Aug. 1899, DUSS n. 4069 (KU). Insuper MIGNOT (Bss). — Santa Lucia: ANDERSON (K); CRUDY, ex herb. SCHMIEDEL. (M); coll. haud not., ex herb. SCHREB. (M); ex herb. SCHWÄGRICHEN (M). — St. Vincent: anno 1822, GUILDING (D, K, M); in silvis montium Montrose Hills, 26. 12. 89, EGGERS n. 6545 (KU, P); in montibus St. Andrews, 2. 1. 90, EGGERS n. 6777 (KU); H. H. et G. W. SMITH n. 359 (KU); ad stationem botanicam, POWELL n. 77 (KU); coll. haud not. ex herb.

FISCHER (Petr). — Bequia: in declivibus montium inter frutices, alt. 300 m, Julio 1890, H. H. et G. W. SMITH n. B. 297 (KU). — Margarita: in monte San Juan, alt. 500 m, 19. 7. 03, J. R. JOHNSTON n. 96 (H, KU).

The history of this species goes back to the remarkable voyage of PLUMIER and SURIAN in 1689—90. Having discovered it, most probably, in Martinique, PLUMIER figured it in PLUM. ed. BURM., tab. 130, fig. 2, and upon this figure LINNÆUS in *Systema Naturæ*, 1759, p. 1213 based his *Conyza arborescens*.

There is a point to be discussed in this connection. The passage in *Systema Naturæ*, ed. X, where LINNÆUS describes *Conyza arborescens* reads as follows: »C. (arborescens) fol. ovatis integerrimis subtus tomentosis, spicis recurvatis secundis, bract. reflexis. Plum. ic. t. 130. f. 2.» The description is not merely copied from PLUMIER; for LINNÆUS has given here some characters of his species that must refer to another plant than that figured by PLUMIER, for instance the statements »fol. . . . subtus tomentosis, spicis recurvatis». There is full evidence as to which plant these statements refer to. In 1758 LINNÆUS had purchased a set of plants collected in Jamaica by PATRICK BROWNE, and among these plants there was a specimen of a *Vernonia*, the same which I mention in this paper, on p. 59, as *V. divaricata* Sw. This specimen is now in the Linnæan Herbarium in London. When I was there in 1910, I had not yet decided to study especially the West Indian Vernoniæ, and I only stated that under *C. arborescens* in the Linnæan Herbarium there were two plants: the one *V. divaricata* Sw. from Jamaica, labelled in LINNÆUS's handwriting »*Conyza arborescens*» from »Br.»; the other *V. scorpioides* (LAM.) PERS. from Guyana. Prof. C. A. M. LINDMAN subsequently (in 1912) visited the Linnæan Society, and obliged me by making a brief description and an exact drawing of the two specimens in question. I thus easily ascertained that the remarks »fol. . . . subtus tomentosis, spicis recurvatis» refer to the plant collected by BROWNE. Another statement in the description of *Conyza arborescens*, »bracteis reflexis», seems to refer to the plant figured by PLUMIER, the specimen in the Linnæan Herbarium showing only a few small bracts. As matters now stand, I think we have better take the figure of PLUMIER connected with

the specimen in the SURIAN Herbarium (P) as the type of *Conyza arborescens* L. rather than the plant in LINNÆUS's herbarium, as this only partly corresponds with his description. LINNÆUS himself seems to have laid more stress upon the plant figured by PLUMIER, to judge by his specific name of the plant, *C. arborescens*, the name taken from »*Eupatorium arborescens floribus cæruleis*», PLUM. l. c. It is puzzling that he has not quoted the synonym in BROWNE, Jam., p. 313, under his *C. arborescens*, which he would certainly have done, if he had considered the Jamaican specimen in writing the description. It seems as though *C. arborescens* had been originally based upon the figure of PLUMIER, and had had its description afterwards somewhat modified according to the Jamaican plant.

If the name *C. arborescens* goes with the description, it must be the Jamaican plant which should be named *V. arborescens* (L.) Sw. The Martinique plant of PLUMIER should then be called *V. icosantha* DC.

Later on in the year 1759 LINNÆUS attributed, in *Pugillus Jamaicensium plantarum*, Amoen. Acad. Vol. 5, p. 406, to his *C. arborescens* the synonym of BROWNE already mentioned, and another synonym also referring to the Jamaican species from SLOANE. In this way the incorrect application of *C. arborescens* to the Jamaican plant became more decisive.

OLOF SWARTZ, in fact, on his return from Jamaica, saw in London the plant of BROWNE and SLOANE, and taking this to be the genuine *Conyza arborescens*, he described it in his *Observationes*, p. 304. On the same plant he afterwards, in *Flora Indiæ occidentalis*, based his *Vernonia arborescens*. Thus the *Vernonia arborescens* became definitely a Jamaican plant. Consequently, when it became evident that the Martinique plant was different from the Jamaican one, the former was described as a new species, viz. *V. icosantha* DC. A general vagueness, however, as to the correct application of the name *V. arborescens* gradually crept in, so that nearly all species of the *Arborescentes* have borne the name.

Thus do matters stand up to the end of the nineteenth century. At length, the demand for a consistent nomenclature had begun to make itself felt. The routes of the ancient travellers were studied in order to ascertain where

their plants have been collected. Thus it became obvious, in our case, that the type of *V. arborescens* could not be the Jamaican plant, PLUMIER and SURIAN never having visited Jamaica. In 1902 Prof. IGN. URBAN succeeded in recognizing the type of *V. arborescens* in a plant sent by DUSS from Martinique, though he did not publish his discovery. I am happy to mention that on a visit to Paris I found the *Conyza arborescens* in the SURIAN Herbarium, fasc. 2, n. 198. It is the same plant as that of DUSS, and represents a leafy form of *V. icosantha* DC. The SURIAN plant must be considered as the type of *V. arborescens* (L.), being most probably the original of the figure in PLUM. ed. BURM.

The application of the name *V. arborescens* to the Martinique plant being thus adopted here, an interesting question remains. How to quote the author of the combination *V. arborescens* (L.)? The first to transfer *Conyza arborescens* L. into *Vernonia* was SWARTZ. But the description of his *V. arborescens* is incorrect, as is its distribution, SWARTZ having the Jamaican plant in mind. Now the question is: can SWARTZ be cited as author of the combination *V. arborescens* (L.), applied to the Martinique plant? I think he can, and must, be so cited. For the operation of transferring a species from one genus into another is a matter independent of the plant at the same time described. The new combination formed belongs to the same plant to which the original name was given; it has, in other words, the same type as this, the two names are typonyms in the American sense of the word. And the one who first published it is to be cited as author of the combination. Thus in our case, SWARTZ is to be cited for *V. arborescens* (L.), and this name has for its type the type of *Conyza arborescens* L. When SWARTZ refers the Jamaican plant to his combination, it is simply a false determination. I have asked Prof. URBAN for his opinion on this matter, and he answered me: »Die *Vernonia arborescens*-Frage ist mir vollständig gegenwärtig, da ich bereits vor vielen Jahren die Plumiersche Abbildung mit *Vernonia icosantha* DC. von Martinique identifiziert habe. . . . Früher war ich auch der Meinung, dass man auf Grund einer solchen Identifizierung nochmals die Combination vornehmen und seinen eigenen Namen als Autor dahinter schreiben soll. Ich habe sie jetzt aufgegeben, weil sie unpraktisch und nicht

ganz gerecht ist; denn Swartz hat doch erkannt, dass die *Conyza arborescens* eine *Vernonia* ist, und hat die Combination *richtig* vollzogen. Was bei ihm darauf folgt: Beschreibung und Vaterland ist allerdings falsch. Wenn Sie genau sein wollen, können Sie schreiben:

V. arborescens (L.) Sw. (quoad syn. Linn., non quoad descript. nec patriam.

Auch die Nordamerikaner verfahren so von ihrem Princip der 'Priority in place' aus».

For further illustration to this point I refer to HITCHCOCK, North American species of *Panicum*, Contr. U. S. Nat. Herb., Vol. 15, 1910, p. 6, and to URBAN, Symb. Antill., Vol. VII, 1913, p. 342.

V. arborescens (L.) Sw. is evidently the *Vernonia* of the Windward Islands, being known from Martinique, Santa Lucia, St. Vincent, Bequia and Margarita. There are only two points indicating a wider distribution of the species. In the Prodrum Herbarium I found a plant from Havana collected by DE LA OSSA, and referred to *V. arborescens* (L.) Sw. β *ovatifolia* DC.; it is, however, a typical *V. arborescens* (L.) Sw. Nothing is known about DE LA OSSA collecting in Martinique, so that it must be supposed that the plant occurred at Havana. Most probably it grew in the botanical gardens of that town, of which DE LA OSSA was director. Further, GLEASON asserts that he has seen specimens of his *V. ventosa* from Guadeloupe. I venture to suppose that this statement is due to a confusion with the large-headed form of *V. albicaulis* PERS. common in that island. In fact, DUSS n. 2812, representing this very form, was determined by GLEASON in a letter to Prof. URBAN as *V. ventosa* GLEASON. In his »Studies» he cites the same plant as *V. icosantha* DC. (GLEASON, 1913, p. 307).

An interesting locality for the species is the island of Margarita near the coast of Venezuela, rather distant from its main region. It occurs there in a somewhat different form, hardly at first sight recognizable as *V. arborescens*. In habit it resembles a rigid *V. Trinitatis* EKMAN, but is easily distinguished from that species by its small heads.

Like many West Indian *Vernoniae*, *V. arborescens* is extremely variable. I need not insist that I have repeatedly looked over the abundant material on the chance of discov-

ering any constant forms, and that I have examined numbers of flowers for the same purpose. But in vain. The forms pass evidently into each other, and their particular habits are probably due to the particular circumstances in which the plants have lived. However, the types of the three different names of the species, *V. arborescens*, *V. icosantha*, and *V. ventosa*, represent, as it happens, each a particular form of the species, yet not in such a way, that the species could be divided throughout into three series each corresponding to one name. For the intergrading forms are as numerous as the typical ones. The three forms may be briefly characterized.

1. The type of *V. arborescens* (L.) SW.: Leaves broad, dim. 11,5 cm in length, 5 cm in width, thinly membranaceous, nearly glabrous, with broadly rounded and slightly cordate base. Inflorescence very lax, the heads at a distance of 2—4 cm and subtended by bracteal leaves, the lower of which are nearly as large as the leaves themselves. Evidently, this is a form of damp, shady localities. So, for instance, DUSS n. 305, 931, 4069.

2. The type of *V. icosantha* DC.: Leaves large, somewhat narrowed, up to 11 cm long, 4 cm broad, attenuate at the base, firm, nearly glabrous. Inflorescence somewhat dense, the heads more crowded, 1 cm or so apart, the bracteal leaves smaller, the upper ones linear, not longer than the heads. So EGGERS n. 6545, 6777, POWELL n. 77, H. H. et G. W. SMITH n. B. 297, etc.

3. The type of *V. ventosa* GLEASON: Leaves small, lanceolate-ovate, usually 6 cm long, 2 cm wide, firm, rounded or attenuate at the base, strigose pubescent, often grayish or even whitened beneath. Inflorescence generally dense, the bracteal leaves small. So DUSS n. 303, 304, 984. HAHN in 1870 represents an interesting form with leaves of *V. ventosa* and inflorescence of *V. arborescens*.

Vernonia albicaulis PERS.

Tabula nostra II, fig. 5 (pars. infl. et folium).

Eupatorium obtusifolium WILLDENOW, 1804, p. 1768.

Conyza glabra WILLDENOW, 1804, p. 1940.

Vernonia albicaulis PERSOON, 1807, p. 404, n. 11: LESSING, 1829, p. 313; GLEASON, 1906 b, p. 186.

- Vernonia longifolia* PERSOON, 1807, p. 404, n. 12; DE CANDOLLE, 1836, p. 49; GLEASON, 1906 b, p. 186; 1913, p. 326; URBAN, 1911, p. 620.
Lepidaploa albicaulis CASSINI, 1823, p. 17.
Lepidaploa lanceolata CASSINI, 1823, p. 18. (?)
Vernonia punctata SWARTZ apud WIKSTRÖM, 1828, p. 72; GRISEBACH, 1861, p. 353.
Vernonia emarginata WIKSTRÖM, 1828, p. 73.
Vernonia Vahlia LESSING, 1829, p. 306; 1831, p. 666; DE CANDOLLE, 1836, p. 48, p. p.
Vernonia arborescens SW. β *ovatifolia* DE CANDOLLE, 1836, p. 48, p. p.
Eupatorium secundiflorum BERTERO ex DE CANDOLLE, 1836, p. 48.
Vernonia Thomæ BENTHAM, 1852, p. 66; GLEASON, 1906 b, p. 191.
Cacalia Thomæ KUNTZE, 1891, p. 324.
Cacalia punctata KUNTZE, 1891, p. 971.
Vernonia longifolia PERS. varietates α *genuina*, β *Vahlia*, γ *Sintenisii* URBAN, 1899, p. 456; 1911, p. 620.
Vernonia Sintenisii GLEASON, 1906 b, p. 187.

Pappi setæ interiores persistentes, numero 35—40, tenues, sordide stramineæ vel albidæ, quam exteriores distinctæ 7-plo longiores. Corolla 6—8 mm longa (in specimine unico anomalo corollas vidi 10,5 mm longas), glabra, tubo apice parum dilatato long. $\frac{1}{2}$ corollæ, limbi laciniis apice subtus papillosis vel pilis nonnullis brevissimis instructis. Antheræ 2—2,8 mm longæ (in spec. unico anomalo vidi antheras 3,2 mm longas), ligula fere enervi, long. $\frac{1}{8}$ antheræ, auriculis longe acutatis.

Hab. in Porto Rico: LEDRU (P, herb. LAMARCK); GROSOURDY, eat. n. 13 (P); prope Isabela, Jun. 1887, STAHL n. 730 (KU); inter Ponce et Peñuelas, in montibus calcareis, Aug. 1888, STAHL n. 926 (KU); prope Caño Grande, anno 1876, GUNDLACH n. 594 (KU); prope Guanico in declivibus umbrosis montis El Maniel, 10. 2. 86, SINTENIS n. 3727 (BB, D, DC, H, K, KU, M, P, S); prope Peñuelas in declivibus montis Vi, 8. 7. 86, SINTENIS n. 4731 (K, KU); prope Peñuelas in declivibus umbrosis montis Llano, 6. 7. 86, SINTENIS n. 4750 (KU); prope Rincón in montibus ad Barrio Punta, 11. 12. 86, SINTENIS n. 5639 (KU); 5. 12. 02, A. A. HELLER n. 6214 (D). — St. Thomas: LEDRU n. 230 (P); RAVN (H); KREBS (H); OERSTED n. 56 (K); OERSTED sine num. (H); EGGERS in Aug. 1880 (KU); EGGERS n. 1170 (B, M, P); ad Bolongo, Dec. 1886, EGGERS n. 34 (H); EGGERS, Dec. 1887 (KU); Mart. 1874, O. KUNTZE n. 131 (K); Nov. 1905, RAUNKIÆR n. 3154 (H); ad Mandal, 5. 5. 06, RAUNKIÆR n. 1918

(H); ad Lövenlund, 5. 5. 10, RAUNKLÆR n. 3155 (H); coll. haud not. (P). — St. Jan: in campestribus apricis S:ti Joannis, L. C. RICHARD (P); in summis collibus mari imminentibus prope Brown's Bay ins. S:ti Joannis, L. C. RICHARD (P); ad Hermansfarm, 9. 3. 77, EGGERS sine num. (H); ad »Klein Kaneel» Bay, 24. 12. 87, EGGERS n. 3036 (H); in parte occidentali, 13. 2. 06, RAUNKLÆR n. 3136 (H); coll. haud not. (D). — St. Croix: ROHR (Br); in montibus summis apricis S:tæ Crucis, L. C. RICHARD (P); WEST (H, S); BENZON (H); RAVN (H); ad viam prope »Elizas Retreat», Dec. 1869, EGGERS n. 407 (H); eo loco, Dec. 1870, EGGERS sine num. (H); ad Christiansted frequens, Jan. 1872, EGGERS sin. num. (H); ad Crequis, 10. 9. 74, EGGERS sin. num. (H); PAULSEN n. 68 (H); in litore septentrionali, Maj. 1893, PAULSEN n. 75 (H); ad Marion Hoy, 17. 1. 96, A. E. RICKSECKER n. 220 (KU); ad »Northside Road», 20. 2. 97, J. J. RICKSECKER n. 150 (KU); in Jolly Hill, 1. 1. 06, RAUNKLÆR n. 1919 (H); in valle »Caledoniadalen», 2. 2. 06, RAUNKLÆR n. 3162 (H); coll. haud not. (P, herb. JUSSIEU, orig. spec. *V. albicaulis* PERS.). — St. Martin: 4. 5. 85, SURINGAR sine num. (KU). — St. Barthelemy: FORSSTRÖM (Br, S); GOËS (KU, S). — Saba: anno 1906, BOLDINGH n. 1968 B. (KU). — St. Eustache: in colle Signalhill, 9. 4. 85, SURINGAR sine num. (KU). — St. Kitts: RYAN (H); ad Sandy Point, anno 1901, BRITTON et POWELL n. 144 (KU). — Antigua: L. C. RICHARD (CD, sub nom. *Vernonia bipartita* RICH., P); NICHOLSON (K); LANE n. 415 (K); in fruticetis, WULLSCHLÄGEL n. 290 (G, M). — Montserrat: RYAN (H, S). — Guadeloupe: in fruticetis—silvulis redivis ins. Guadeloupe, L. C. RICHARD (P); BADIÉ n. 44 (Prodr); FORSSTRÖM (Bss, Prodr, S); BERTERO (B, Prodr); 20. 6. 24, PERROTTET n. 251 (P); Montenegro de la Guadeloupe, 27. 6. 24, PERROTTET n. 250 (P); Jan. 1843, L'HERMINIER (P); KRAUSS, anno 1818 (Prodr); BEAUPER-TUIS (P); DUCHASSAING (G, K, P); DUSS n. 435, 436, 437 (P); ad Morne Gobelin, Gombegre, anno 1892, DUSS n. 2489 (KU); Baillif, Roulade Basse-Terre à Montéran, Vieux Fort—Capesterre; Désirade, locis siccis, alt. 100—315 m, anno 1892, DUSS n. 2812 (KU). — Désirade: conf. adnot. sched. DUSS n. 2812. — Dominica: IMRAY n. 294 (G); prope Wallhouse, 18. 2. 80, EGGERS n. 73 (K, KU); in monte Morne Gombo, 2. 3. 80, EGGERS n. 75 (K, KU); Dec. 1881, EGGERS

n. 891 (K, KU); EGGERS n. 1171 (B, M, P) — Sine coll. notis: Ex herb. VAILLANT (P, »*Conyza americana Salicis Capreæ folio, flore albo*. J. R. H. 455»); Herb. WILLD. n. 15144 (B, orig. spec. *Eupatorii obtusifolii* WILLD.); Herb. WILLD. n. 15622 (B, orig. spec. *Conyzæ glabræ* WILLD.); WEST (Prodr.); »373, in rupibus calcareis prope Mocam», Aug. 1827 (D, verisimiliter coll. WYDLER); EGGERS n. 196 (D), n. 416 (P).

Though early collected (represented, for instance, in the herbaria of VAILLANT, LAMARCK and JUSSIEU) the species did not get its valid name, *V. albicaulis* PERS., till the year 1807. Certainly, there are two older binomial synonyms for it, both of WILLDENOW, viz. *Eupatorium obtusifolium* and *Conyza glabra*, but these specific names are invalidated by *Vernonia obtusifolia* LESS. and *Vernonia glabra* VATKE, both valid names. *Vernonia albicaulis* PERS. was published in the same work, even on the same page as its synonym *V. longifolia* PERS. The latter name has generally been used for the species. When I take the first to be valid, my strongest reason is the fact that *V. albicaulis* precedes *V. longifolia* on the page, the former being numbered 11, the second 12. Further, *V. albicaulis* represents a central form of the species, *V. longifolia* an outlying one. Since GLEASON in his »Revision» uses the name *V. albicaulis*, it will surely not appear too unfamiliar.

V. albicaulis is the *Vernonia* of the Leeward Islands, as its near relative *V. arborescens* (L.) Sw. is the *Vernonia* of the Windward Islands. It is true that I have seen several specimens collected, according to their labels, in other islands. Collectors, however, have not always been so cautious with their statements as in our days. The labels were often written a long time after the plants had been collected, and lapses of memory were consequently likely to occur. On the distribution of the plants, labels may often have been interchanged. However, these specimens presumably erroneously labelled are very few compared with the abundance of material collected in the Leeward Islands. I have seen the following: *Mayerhoff*, Hispaniola, in 1852 (B). In habit this plant agrees exactly with specimens of *V. albicaulis* from St. Thomas and it may, indeed, have been collected there. No other collector has *V. albicaulis* from Hispaniola. — »N:o 370. Coniza

unique e Martinique». This specimen is in the LAMARCK Herbarium at Paris; no collector is given. — Martinique, PLÉE n. 957 (P). The specimen may be from Porto Rico, where PLÉE also collected. — Martinique, DUSS n. 302 (KU); according to the label the plant was collected in 1890, and since DUSS that year collected in Guadeloupe, it is very probable that his plant came from that island, inasmuch as it agrees perfectly with other specimens from Guadeloupe, for instance, DUSS n. 2489. — Martinique, DUSS n. 4070 (KU). The label of this specimen reads: »N:o 4070. Père Duss, Herbar de la Martinique. *Vernonia longifolia* PERS. ex GLEASON in literis. Casser coutelas. Haut de $1\frac{1}{2}$ — $3\frac{1}{2}$ m. fl. violacées ou violet pale ou blanches. Abondant, fl. de Juin en 10-bre. Case Pilote. Alt. 2—450 m. Le Août 1899». According to this the plant should be common at Case Pilote in Martinique. But then it is puzzling that it has not been collected there more than once. Most probably the label in question originally belonged to a specimen of *V. arborescens* (L.) Sw., and has been interchanged afterwards. URBAN states in his Notæ biographicæ that there are many errors of locality on the Dussian labels. — Santa Lucia: leg. CRUDY (M); probably from St. Thomas, where CRUDY also collected. — St. Vincent: leg. ANDERSON (K). The specimen resembles those from Guadeloupe, and may have been collected there, or in another island near it.

There is a specimen of *V. albicaulis* in the Paris Herbarium, the locality of which »e Caroline, TH. NOISETTE», if meant for the North American state by this name, clearly must be an error.

As indicated by the numerous synonyms, *V. albicaulis* is highly variable. Outlying forms of it, such as *V. punctata* Sw., *V. longifolia* PERS. and *V. Sintenisii* GLEASON have been described as distinct species. However, it is the same case with *V. albicaulis* as with other Vernoniæ, for instance, *V. arborescens* (L.) Sw. and *V. divaricata* Sw.: the whole set of forms constitutes a variable, though always easily recognizable, species with a particular geographical range, each form considered as a species becomes impossible to delimitate. The only consistent way is therefore to take *V. albicaulis* as the wide species here conceived.

It must be acknowledged, however, that the different

forms of the species do not live anywhere within its range. In the northern part of it round-leaved forms with tawny pappus dominate, towards the South narrow-leaved ones with white pappus become numerous. It is a remarkable fact that *V. albicaulis* thus on the confines of the range of *V. arborescens* (L.) Sw. becomes like that species, though always recognizable by the characters of the involucre and by the acute basal lobes of the anthers. If this is due to some ancient hybridization, or if *V. albicaulis* and *V. arborescens* are to be looked upon as rather recent offshoots of one species, the southern forms being almost unaltered descendants of the common type, or if the fact of matter is, that either of the species (most probably *V. arborescens*) on its migration has been altered by the force of climate into the other, the forms in question owing their existence to a particular intermediate climate, of course cannot be discussed here.

It may, perhaps, be of some use to characterize the most prominent forms of the species and to give their distribution.

1. The type of *V. Sintenisii* (URB.) GLEASON: Leaves small, oblong (dimensions: $3 \times 1,2$ cm), obtuse or even emarginated, thinly pubescent with appressed hairs, somewhat sericeous-shining. Heads relatively small, about 8 mm long. Pappus pale straw-coloured. This is the form of Porto Rico. However, not all specimens from this island are true *V. Sintenisii* GLEASON. Some of them agree almost exactly with the type of *V. albicaulis* PERS., for instance, SINTENIS n. 470, others cannot be distinguished from *V. emarginata* WIKSTR., so STAHL n. 730.

2. The type of *V. albicaulis* PERS. Leaves oval (dim. 5×3 cm), obtuse at the apex and shortly attenuate at base, very thinly pubescent, not shining, grayish-green or grayish-olivaceous. Heads small, 6—7 mm long, in number 4—5 on slightly recurved cymes, somewhat apart. Pappus very pale straw-coloured. This form occurs in its most typical shape in St. Croix, where it was collected by the ancient Danish botanists. The original specimen at Paris came from VAHL, as did the types of *Eupatorium obtusifolium* WILLD. and *Vernonia Vahlia* LESS.

To this approximate two forms, one having very large, acute leaves (dim. $13 \times 6,5$ cm) and larger heads (9—10 mm long),

collected in St. Croix and in Montserrat (*Conyza glabra* WILLD. resembles this), the other having small, obtuse leaves (dim. 2,7—5 × 1,6—2,5 cm), which are very often curled or undulated at the margin. The heads of this form are small, densely crowded towards the top of the naked peduncles, and subtended by great bracteal leaves. It is the form of St. Thomas and St. Jan. The type specimen of *V. Thomæ* BENTH., however, does not belong to this form, rather to *V. albicaulis* sensu strict.

3. The type of *V. emarginata* WIKSTR. Leaves small (dim. 2,5 × 1,3 cm), thinly pubescent or nearly glabrous, obtuse or somewhat emarginated at the top, rufous-green (the branches are often rufous-tomentose). Heads small, 6 mm high or so, densely crowded in the top of naked peduncles forming a rounded inflorescence, or scattered along more elongated cymes. Pappus brown or tawny. The range of this form extends from St. Martin to Guadeloupe. However, *V. albicaulis* sensu strict. seems to live within this range, in Montserrat. Perhaps the locality of the specimen in question, collected by WEST, is an error.

Also of this form specimens have been seen having very large leaves (dim. 11 × 4,5 cm) and many-flowered inflorescence. So RYAN and WEST from St. Croix (?) and St. Kitts.

4. The type of *V. longifolia* PERS. Leaves lanceolate, 1 dm long, 3—4 cm broad, acute, glabrous or very nearly so, olivaceous above, pale and somewhat shining beneath. Heads small, 6—7 mm high, numerous in a broadly pyramidal inflorescence. Pappus tawny, not dense. So in Guadeloupe and Dominica.

I have not seen the type specimen of *V. longifolia* PERS., this probably being in the DESFONTAINES Herbarium at Florence. I therefore cannot decide if it belongs to the form just described, or to the following. The very name of the species, however, applies very well to the form described, and since it is the more common one, and always has been considered as the genuine *V. longifolia*, I think it must be that species.

5. The type of *V. punctata* Sw. Differs from the preceding in having large heads and white, stiff pappus. The type specimen of *V. punctata* Sw. has rather narrowed leaves (dim. 6—7 × 1,2—1,4 cm) and somewhat crowded heads. Other specimens examined have wider leaves and up to 6

cm long, curved cymes. This is *V. arborescens* (L.) Sw. β . *ovatifolia* DC. *V. punctata* is known from Guadeloupe and, in a slightly different form, from Dominica.

***Vernonia albicaulis* PERS. $\times$ *sericea* L. C. RICH.**

$\asymp$ *Vernonia Gleasonii* EKMAN nov. hybr.

Characteres omnes parentium mixtæ. Frutex 1—2-metralis (SINTENIS). Rami tenues, tenuissime striati, adulti glabri, avellanei, hornotini sordide stramineo-tomentosi. Folia spiraliter enata, brevissime petiolata, petiolo 2 mm longo, ut rami tomentoso; laminæ anguste ovatæ, 3—5 cm longæ, 1,2—1,5 cm latæ, apice obtusæ vel brevissime acutæ, basi breviter attenuatæ, chartaceæ, pallide olivaceo-virides, integerrimæ, obsolete rugosæ, margine leviter revolutæ, supra pilis brevibus, appressis dispersæ, juniores præsertim subtus tenuiter griseo-sericeæ, adultæ ut in *V. albicauli* pilis laxioribus vestitæ, rete nervorum subtus satis prominente. Inflorescentia cymoso-scorpioidea, cymis ut in *V. sericea* elongatis, divaricatis, polycephalis; bracteis foliaceis calathidiis triplo longioribus vel superioribus iis æquilongis. Calathidia axillaria, sessilia, remota, spatio 1,5 cm longo inter se disjuncta, 15—16-flora. Involucrum vivum subcampanulatum, basi rotundatum, sicc. ut in *V. sericea* late infundibuliforme, 5 cm altum, circ. 6 mm latum, squamis circ. 4-seriatis, exterioribus brevissimis, deltoideo-lanceolatis, acutissimis, conspicue mucronulatis, inferioribus lineari-lanceolatis, acutis, omnibus carinatis, villosis, pallide brunneis, vix nitidis, inferioribus sæpe subpurpurascentibus. Pappi setæ interiores persistentes, numero 35—45, tenues, graciles, 4—4,5 mm longæ, sordide stramineæ, exterioribus ligulatis conspicuis circ. 7-plo longiores. Corolla 6,5 mm longa, tubo glabro fere $\frac{3}{5}$ long. corollæ, limbi laciniis apice subtus papillo-sis. Antheræ 1,6 mm longæ, ligula $\frac{1}{6}$ long. antheræ, auriculis longe acutatis. Achænium 2—2,3 mm longum, appresso-sericeum, costis distinctis.

Planta hoc loco descripta, characteribus inter parentes plane intermedia, quamvis fertilis sit, sine ulla dubitatione origine hybrida est.

Hab. in Porto Rico: prope Peñuelas in declivibus

umbrosis montis Llano, 6. 7. 86, SINTENIS n. 4749 (D, KU, P). — St. Jan: ad Küstenberg, alt. 210 m, 31. 12. 87, EGGERS n. 3256 (KU). — St. Croix: ex herb. HORNE-MANN (B). — Coll. ignot. (H).

In collections from the tropics hybrids are only very seldom found, apparently because the collectors have been collecting by chance, without knowing the species. In our case, however, the probability of getting the hybrid was a greater one, both the parents, *V. albicaulis* and *V. sericea*, being doubtless familiar to collectors like EGGERS and SINTENIS. In fact, not less than four particular collections of the hybrid have been made.

The hybridous nature of our plant is clearly manifested by the fact, that in all characters it is intermediate between its supposed parents. It constitutes a particular type, having characters of both parents, and only of them. Since *V. albicaulis* and *V. sericea* have never been found to pass into each other, it cannot be considered merely as an intergrading form. However, its pollen seems to be rather good. The grains are somewhat cornered and dark-coloured, and do not swell swiftly when boiled in milk acid and water. The achenes are well evolved.

The best character of the hybrid is the length of its anthers. *V. albicaulis* has large anthers, 2,5 mm in length, *V. sericea* very small ones, only 0,8 mm long. Now the hybrid has quite intermediate anthers, 1,6 mm in length. As to the leaves it is rather variable, EGGERS n. 3256 having leaves of *V. albicaulis* sensu strict. and HORNE-MANN like those of *V. sericea*. The inflorescence resembles that of *V. sericea*. The involucre is larger than those of *V. sericea*, including 15—16 flowers (in *V. sericea* 11—13, in *V. albicaulis* 20—21); as to their form they are intermediate. The scales resemble those of *V. albicaulis*, yet the outer ones are cuspidate, as in *V. sericea*, and the inner ones often somewhat purplish, as in that species. The colour of the pappus is tawny.

Vernonia borinquensis URB.

Tabula nostra II, fig. 7 (cyms).

Vernonia arborescens Sw. var. *Lessingiana* STAHL, 1887, p. 103, p. p.

— non GRISEB.

Vernonia borinquensis URBAN, 1903, p. 390; 1911, p. 619; GLEASON, 1906 b, p. 179.

Pappi setæ interiores persistentes, numero 30—35, tenues, filiformes, pallide brunneæ, quam exteriores distinctæ circ. 8-plo longiores. Corolla 8 mm longa, tubo gracili, subito in limbum amplifiato, long. $\frac{1}{2}$ corollæ, extus glandulis nunnullis instructo, limbi laciniis apice papillosis. Antheræ 2,5 mm longæ, ligula long. $\frac{1}{7}$ antheræ, nervo satis perspicuo, auriculis obtusiusculis.

Hab. in Porto Rico: prope Maricao, ad margines silvarum, 12. 11. 84, SENTENIS n. 388 (BB, DC, KU, M); Sierra de Juncos in graminosis apricis montis Guvuy, 28. 8. 85, SENTENIS n. 2659 (KU); Lares, ad margines silvarum ad Anon, 16. 1. 87, SENTENIS n. 5884 (KU); Lares, in fruticetis ad Jobo, 29. 11. 87, SENTENIS n. 6079 (KU, P); Utuado, in marginibus silvarum ad Paso-palma, 4. 3. 87, SENTENIS n. 6362 (D, KU); prope Mayagüez, alt. 150 m, 26. 1. 1900, HELLER n. 4391 (KU).

var. *Stahlia* URB.

Vernonia borinquensis URB. var. β *Stahlia* URBAN, 1903, p. 391; 1911, p. 620.

Pappi setæ numero 25—30. Antheræ 2,3 mm longæ, ligula long. $\frac{1}{8}$ antheræ, auriculis acutiusculis; cet. ut in specie.

Hab. in Porto Rico: prope Bayamon, in fruticetis, Dec. 1883, STAHL n. 238 (KU); prope Bayamon, alt. 450 m, Majo 1887, STAHL n. 667 (KU); prope Aibonito in declivibus, 25. 11. 85, SENTENIS n. 2862 (B, BB, KU, M).

Though closely allied to *V. arborescens* (L.) Sw. and *V. albicaulis* PERS., *V. borinquensis* at first sight amply differs in its peculiar habit due to the widely spreading inflorescence with its stiff, zigzag-bent cymes. It recalls somewhat *V. sericea* L. C. RICH., from which it is distinguished, above all, by its nearly glabrous leaves.

The variety *Stahlia* URB. differs invariantly in wanting glandular points on the lower surface of the leaves, and in its nearly glabrous achenes. However, there is no difference in habit between the species and its variety. It seems to me therefore most conformable to the relationship between the two plants to list them as species and variety.

3. The allies of *V. bahamensis* GRISEB.*Vernonia bahamensis* GRISEB.

Tabula nostra II, fig. 2 (habitus et folium).

Vernonia bahamensis GRISEBACH, 1861, p. 352; GLEASON, 1906 a, p. 187; 1906 b, p. 190; 1913, p. 326.

Cacalia bahamensis KUNTZE, 1891, p. 369.

Pappi setæ interiores persistentes, numero 40, tenues, exterioribus distinctis circ. 7-plo longiores. Corolla 6,5 mm longa, tubo glabro, apice sensim dilatato, long. $\frac{4}{7}$ corollæ, limbi laciniis apice pilis nonnullis satis longis munitis, subtus papillois. Antheræ 2,7 mm longæ, ligula nervosula $\frac{1}{5}$ long. antheræ, auriculis satis elongatis, obtusiusculis.

Hab. in insulis Baham. Fortune Island: 4. 2. 88, EGGERS n. 3832 (BB, D, H, KU, M, P, S). — Acklins Island: 9. 2. 88, EGGERS n. 3893 (KU).

The Vernoniæ of the Bahamas have been the object of a particular study by GLEASON. His exposition, entitled: »The genus Vernonia in the Bahamas», Bull. Torrey Bot. Club, Vol. 33, 1906, is accepted here as substantially correct.

Vernonia obcordata GLEASON.

Vernonia obcordata GLEASON, 1906 a, p. 187; 1906 b, p. 190.

Hab. in insula Baham. Little Inagua Island: 20. 10. 04, NASH and TAYLOR n. 1206.

I have seen no specimens of this plant.

Vernonia arbuscula LESS.

Tabula nostra II, fig. 3 (habitus).

Vernonia arbuscula LESSING, 1831, p. 664.

Vernonia arctata GLEASON, 1906 a, p. 185; 1906 b, p. 189; 1913, p. 326.

Pappi setæ interiores persistentes, numero 45, tenues, quam exteriores distinctæ 7-plo longiores. Corolla 6 mm longa, tubo amplo, glabro, long $\frac{4}{7}$ corollæ, limbi laciniis apice pilis nonnullis præditis subtusque papillois. Antheræ 2,5

mm longae, ligula $\frac{1}{5}$ long. antheræ, enervi, auriculis brevibus, truncato-obtusis.

Hab. in insula Baham. New Providence Island: in pinetis, 22. 2. 88, EGGERS n. 4187 (KU, M); 10. 1. 90, JOHN et ALICE NORTHROP n. 101 (BB, KU); prope Nassau, 5. 2. 03, CURTISS n. 65 (D, DC, H, K, KU, M.); in altoplanitie montium Blue Mountains, 23. 1. 05, C. F. MILLSPAUGH n. 2481 (KU).

In his brilliant exposition of the *Vernoniæ* known at that time LESSING describes a *V. arbuscula* from Mauritius. My attention was called to his plant by a statement of LESSING that it recalled *V. arborescens* (L.) Sw. On a visit to Berlin I examined the type of the species, and was greatly astonished to recognize in it a throughout typical *V. arctata* GLEASON. The specimen is labelled: »Ex herb. Kunth. *Vernonia arbuscula* n. sp. Isle de Bourbon. Salisbury ded. 1816». It is a puzzle how Mauritius (= Isle de Bourbon) came to be designed as the habitat of the plant; quite certainly it is a typical *V. arctata* GLEASON.

Though strongly resembling *V. bahamensis* GRISEB., *V. arbuscula* is a good species, differing from *V. bahamensis* in the shape and colour of its leaves, as well as in their nervature. In *V. bahamensis* the lateral veins are 4—6, ascending at oblique angles, in *V. arbuscula* they are only 2—3, issuing at nearly right angles.

***Vernonia complicata* GRISEB.**

Tabula nostra II, fig. 4 (habitus).

Vernonia complicata GRISEBACH, 1866, p. 143; GLEASON, 1906 b, p. 189; 1913, p. 327.

Pappi setæ interiores persistentes, numero 45, tenues, quam exteriores fere 7-plo longiores. Corolla 6,5 mm longa, tubo amplo, glabro, long. $\frac{5}{9}$ corollæ, limbi laciniis apice subtus papillois, pilis apicalibus brevissimis aut nullis. Antheræ 2,3 mm longæ, ligula enervi long. $\frac{1}{6}$ antheræ, auriculis obtusiusculis vel brevissime apiculatis.

Hab. in Cuba: WRIGHT n. 2790 (Bss, DC, G, orig. spec., KU, P, S); in rupibus litoralibus prope »Leeward Point» ad sinum Guantanamo, Mart. 1909, BRITTON n. 2225 (KU).

A species of very peculiar habit due to its small, broad, curled, densely tomentose leaves and few, solitary heads.

4. The allies of *Vernonia fruticosa* (L.) Sw.*Vernonia divaricata* Sw.

Tabula nostra II, fig. 6 (pars inflorescentiæ).

Conyza arborescens LINNÆUS, 1759 b, p. 406, quoad syn. BROWNEI et SLOANEI, haud *Conyza arborescens* LINNÆUS, 1759 a, p. 1213, quoad typum; 1763, p. 1209, quoad syn. supra cit.; SWARTZ, 1791, p. 304.

Vernonia divaricata SWARTZ, 1806, p. 1319.

Vernonia arborescens SWARTZ, 1806, p. 1320, quoad descript. et patriam, haud quoad typ. LINNÆI; GLEASON, 1906 b, p. 180.

Vernonia arborescens Sw. *z. Swartziana* GRISEBACH, 1861, p. 353, syn. omnibus exclusis.

Vernonia permollis GLEASON 1906 b, p. 181.

Vernonia intonsa GLEASON, 1906 b, p. 182.

Vernonia albicoma GLEASON, 1906 b, p. 185.

Vernonia amaranthina GLEASON, 1913, p. 307.

Conyza fruticosa flore pallide purpureo, capitulis e lateribus ramulorum spicatum exeuntibus. SLOANE, Cat. p. 124; Jam., p. 257.

Eupatorium l. *Erectum hirsutum*, foliis oblongis rugosis; floribus spicatis per ramos terminales declinantes uno versu dispositis. BROWNE, Jam., p. 313.

Pappi setæ interiores subpersistentes, numero 30—35, crassiusculæ, paullulo complanatæ, albidæ, exterioribus distinctis circ. 8-plo longiores. Corolla fere 6 mm longa, glabra, tubo long. $\frac{1}{2}$ corollæ, superne haud dilatato, limbi laciniis apice subtus papillois. Antheræ 1,8 mm longæ, ligula nervosa long. $\frac{1}{6}$ antheræ, auriculis apice brevissime acuminatis.

Hab. in Jamaica: in herb. LINNÆI; ex herb. VAILLANT (P); W. WRIGHT (S); SHAKESPEARE (Br); SWARTZ (H, M, S, orig. spec. *V. divaricata* et *V. arborescentis* sensu SWARTZII); TUSSAC (D); DISTIN (K, KU); SWAINSON (K); prope St. Marys, Aug. 1843, PURDIE (K); W. WILSON n. 238 (G, KU); WULLSCHLÄGEL n. 875 (G, M); R. C. ALEXANDER-PRIOR (G); MARCH n. 813, 1472, 1738 (G); prope Kingston ad radices montium, 7. 12. 81, LEHMANN n. 939 (B, BB); ad Gordontown, alt. 450 m, 21. 1. 88, EGGERS n. 3481 (BB, D, KU, M); ad Hope River, 21. 1. 88, EGGERS n. 3490 (H); in Providence Road, 5. 8. 97, W. THOMPSON n. 6746 (KU); prope Providence, alt. 210 m, 19. 7. 1900, W. THOMPSON n. 7209 (KU); prope Prospect Hill, circ. 600 m alt., 13. 9. 1900, W. THOMPSON n. 8038 (Br, KU); in »Salt Hill Road», 13. 12. 93, HARRIS n. 5622 (BB, H, KU); prope Hope, 22. 12. 97, HARRIS, n.

6993 (Br, KU); prope Mona, alt. 180 m, 2. 8. 95, CAMPBELL, n. 5870 (KU); in »Arnold Road», alt. 80 m, 25. 11. 95, CAMPBELL n. 6091 (KU, dupl. orig. spec. *V. intonsæ* GLEASON); ad radices montis Long Mountain, alt. 105 m, 13. 1. 96, CAMPBELL n. 6152 (KU, dupl. orig. spec. *V. albicomæ* GLEASON); prope Kingston in montibus humilioribus, anno 1897, O. HANSEN sine num. (H, KU); Cinchona Forrest, Maj. 1903, SHREVE, sine num. (KU, fragm. orig. spec. *V. permollis* GLEASON); Vicinity of New Castle, Hardware Gap, rocky bank, 1. 3. 08, N. L. BRITTON et ARTHUR HOLLICK n. 1788 (KU); coll. ignot. (P, »donné par Sir W. HOOKER 1845»). — Grand Cayman: HITCHCOCK, fide GLEASON, 1913, p. 307.

As early as the year 1696 this species was introduced into the annals of Botany by SLOANE in his Catalogue, and shortly after, in the year 1707, he described it accurately in his Natural History of Jamaica. PATRICK BROWNE also gave a good description of it in Civil and Natural History of Jamaica, p. 313.

I have shown while discussing the name *V. arborescens* (L.) Sw. how SWARTZ came to apply this name to the Jamaican plant. In the same passage I have mentioned the reasons for applying the name *V. arborescens* to the Martinique-plant. Then there arises a problem: what is to be the correct name of the Jamaican plant, the previous *V. arborescens*. At first I thought it must be *V. intonsa* GLEASON, this species agreeing perfectly with the type specimen of *V. arborescens* Sw. However, when I realized that *V. arborescens* sensu SWARTZII, *V. intonsa* GLEASON, *V. permollis* GLEASON, *V. albicoma* GLEASON and even *V. divaricata* Sw. all were only forms of one species, I merely had to take *V. divaricata* Sw. for its name. With this the problem of the synonymy of this Jamaican species had been definitively solved.

It is hardly necessary to state that *V. divaricata* as here understood is an extremely variable species. GLEASON, having abundant, new-collected material of it at his disposal, described some of its forms as new species, viz. *V. permollis*, *V. intonsa*, *V. albicoma*, and *V. amaranthina*. Of these *V. intonsa* is exactly the same as the type of *V. arborescens* Sw., *V. permollis* is an extraordinarily densely pubescent form, and *V. albicoma* a nearly glabrous one. I have not perfectly satisfied myself about the taxonomic value of *V. albicoma*,

the type being somewhat different from *V. divaricata*, above all in its elongated corollas (7 mm). It remains, however, probable that the particular habit of *V. albicoma* is connected with its occurrence in shade localities and, since the idea of the unity of *V. divaricata* Sw. as here understood seems to me very admissible, the species having no very near relative in Jamaica, I have decided to place *V. albicoma* under *V. divaricata* Sw. Besides, there are intermediate forms between *V. albicoma* and *V. divaricata*, for instance, WILSON n. 238.

In the following I have tried to characterize with a few words the most prominent forms of *V. divaricata*. What I have said about the forms of *V. arborescens* (L.) Sw. and *V. albicaulis* PERS., might be verbatim repeated here.

1. The type of *V. divaricata* Sw.: Leaves nearly glabrous. Cymes widely spreading, many heads without bracts. Scales cream-coloured, inner ones not purplish, relatively long-acuminated. Besides the type specimen in the Stockholm Herbarium, there belong here the specimens collected by DISTIN. A specimen collected by WILLIAM WRIGHT in the Stockholm Herbarium has shorter cymes; HANSEN in 1897 has more densely pubescent leaves; PURDIE in the Kew Herbarium has leafy cymes.

2. The type of *V. albicoma* GLEASON: The most glabrous form! Inflorescence rather lax. Heads comparatively large, inner scales somewhat elongated, purplish. Corolla 7 mm in length. CAMPBELL n. 6152.

3. The type of *V. arborescens* GLEASON, not of SWARTZ: The central form, having rather tomentose leaves, shorter, arcuated, nearly leafless cymes, with somewhat aggregated heads. Inner scales purplish, shortly acuminate. To this WILSON n. 238, EGGERS n. 3481 etc.

4. The type of *V. arborescens* Sw.: A densely tomentose form with short cymes, crowded heads, and purplish, shortly acuminate inner scales. The type specimen of *V. intonsa* GLEASON belongs here, further HARRIS n. 5622. LEHMANN n. 989 and HARRIS n. 6993 represent intermediate forms between *V. arborescens* GLEASON and *V. arborescens* Sw.

5. The type of *V. permollis* GLEASON: The most densely tomentose form with broad, rounded leaves, short, nearly bractless cymes, and very crowded heads. The scales are glabrous towards the tip, or with a tuft of hairs near it. The

plant collected by SWAINSON agrees very well with the portion of the type specimen seen.

There also occur forms having elongated, leafy cymes, and distant heads. Such forms also may be found in other species, for instance, *V. arborescens* (L.) Sw. and *V. fruticosa* (L.) Sw. It appears very probable that they do not constitute a particular form, but are only variants of the other ones described. So, for instance, CAMPBELL n. 5870, THOMPSON n. 6746, 7209, 8038.

Vernonia acuminata LESS.

Tabula nostra II, fig. 8 (pars inflorescentiæ).

Vernonia acuminata LESSING, 1831, p. 663; GRISEBACH, 1861, p. 353; GLEASON, 1913, p. 311.

Vernonia divaricata DE CANDOLLE, 1836, p. 48; GLEASON, 1906 b, p. 185; 1913, p. 310 — non *V. divaricata* Sw.

Cacalia acuminata KUNTZE, 1891, p. 969.

Pappi setæ interiores persistentes, numero 30—35, crassiusculæ, paullulo complanatæ, brunneæ, quam exteriores distinctæ circ. 6-plo longiores. Corolla 6—6,5 longa, tubo gracili, glabro, subito in limbum abeunte, long. $\frac{3}{5}$ corollæ, limbi laciniis apice subtus papillosis. Antheræ 1,7—1,8 mm longæ, ligula apice contracta, long. $\frac{1}{6}$ antheræ, nervo perspicuo prædita, auriculis brevissime acuminatis.

Hab. in Jamaica: SHAKESPEARE (Br); SWARTZ (H, Prodr, sub nom. *V. divaricatæ* Sw., S, orig. spec. *V. acuminatæ* LESS., U, herb. THUNB.); MACFADYEN n. 28 (K); DISTIN (K); WULLSCHLÄGEL n. 876 (M); prope Moneague, Dec. 1849, R. C. ALEXANDER-PRIOR sine num. (G, KU); HART n. 665 (KU); inter Claremont et Moneague, 11. 7. 02, FAWCETT n. 8405 (KU); in monte Catherine Peak, alt. 1350 m, 23. 1. 88, EGGERS n. 3592 (KU); prope Kendal, alt. 450 m, 20. 11. 01, HARRIS n. 8205 (KU); in montibus prope Kingston, anno 1897, O. HANSEN sine num. (H, KU).

Though he had abundant material of this species at hand, SWARTZ did not describe it. However, he probably had this plant in mind when he wrote, Fl. Ind. occ. p. 1321: »Provenit et alia in insulis caribæis hujus (*V. arborescentis* Sw.) forte varietas, foliis minoribus ovatis obtusis l. acutis scabriusculis, oculo armato hispidulis, atomis fusco-rubris nitentibus

immersis subtus adpersis, ramulis floriferis erectiusculis subcorymbosis nec divaricatis floribus confertioribus». Specimens of it have been early distributed as *V. divaricata* Sw. var., and so DE CANDOLLE and others were caused to take it as the genuine *V. divaricata*. LESSING, however, who applied this name to our *V. arborescens*, the Martinique plant, realized that the variety of SWARTZ was a new species, and described it as *V. acuminata* LESS.

The wrong idea, however, of this species being the genuine *V. divaricata* Sw. continued to flourish. As recently as in 1906 GLEASON cites *V. acuminata* LESS. as a synonym to *V. divaricata* Sw. In his »Studies» he states the two species to be different, but applies, in fact, the name *V. divaricata* to the genuine *V. acuminata*, and uses the latter name for a somewhat many-flowered variety of the same species! I have not seen the specimen cited to his *V. acuminata*, WRIGHT n. 20, which is said to have 18-flowered heads, those of *V. divaricata* sensu GLEASON having only 11—13 flowers (compare with this the statement of LESSING in the original description of *V. acuminata*: »Capitula 15-flora», which is correct, the heads being 14—15-flowered). But HARRIS n. 8205 in the KRUG-URBAN Herbarium, having 16—17-flowered heads, may agree with GLEASON's *V. acuminata*, as it also agrees with typical *V. acuminata* in all respects, save in the number of flowers. Hence I conclude that, in spite of all, the *V. divaricata* and *V. acuminata* of GLEASON are only one species, namely *V. acuminata* LESS. As I have shown in another passage, *V. divaricata* Sw. is the species called by GLEASON *V. arborescens*.

The species varies but little, and is always easily recognized by its nearly glabrous leaves, acuminate towards both ends, by its pale brown heads in leafy cymes, and by its brown pappus. I had wondered long about the statement made by GRISEBACH in his Flora: »Pappus straw-coloured», until in the Grisebach Herbarium I saw a specimen of *V. acuminata* having, in fact, just that colour of the pappus. Otherwise it does not differ from the genuine *V. acuminata*; also the structure of the flowers is throughout the same.

Vernonia expansa GLEASON.

Tabula nostra III, fig. 4 (inflorescentia).

Vernonia expansa GLEASON, 1906 b, p. 186; 1913, p. 311.

Pappi setæ interiores numero 30, ceteris ut in præced. Corolla 5 mm longa, tubo satis amplo, glabro, in limbum sensim abeunte, cet. præced.; limbi laciniis firmioribus. Antheræ 1,8 mm longæ, ligula sensim attenuata, auriculis plane obtusis.

Hab. in Jamaica: prope Iroy, alt. 600 m, 6. 12. 04, HARRIS n. 8796 (KU, dupl. orig. spec.).

This species is very closely allied to *V. acuminata* LESS., and may prove to be only a variety of this. The distinction given by GLEASON as to the different shape of the leaves scarcely appears sufficient to warrant the separation. There are, in fact, specimens of genuine *V. acuminata* LESS., HANSEN in 1897, having the leaves as shortly attenuate at the base as those of *V. expansa*. However, *V. expansa* is characterized rather well by its small, greenish, somewhat crowded heads, and by its small flowers with wide tube and firm clefts. The material at hand is too scanty to give a reliable account of the taxonomic status of the plant.

Vernonia pluvialis GLEASON.

Tabula nostra III, fig. 8 (inflorescentia).

Frutex fere metralis, diffusus, ramosus. Rami satis crassi, inferne teretes, striati, superne angulati, subcompressi, hornotini appresse pubescentes, pilis brevissimis, sordide albidis; internodia sæpissime brevia. Folia patentia, subsessilia vel brevissime petiolata, petiolo 1—2 mm longo, tenuiter pubescente; laminæ rhomboideo-ellipticæ, 3,5 cm longæ, 1,6 cm latæ, vel lanceolato-rhomboideæ, 5,7 cm longæ, 1,5 cm latæ, apice acutæ vel subacuminatæ, basi attenuatæ—rotundatæ, sat remote glanduloso-denticulatæ, firmæ, planæ, margine subrevolutæ, olivaceo-virides, subtus pallidæ, laeves, utraque facie tenuissime puberulæ, glanduloso-punctatæ; costa nervisque utriusque lateris numero 5—6, utraque facie exsculptis, subtus magis perspicuis. Inflorescentia cymoso-scorpoidea, contracta, ovato-pyramidalis, ad 6 cm longa,

5 cm lata, cymis erecto-patulis, inferioribus ad 4 cm longis, angulato-complanatis, basi longe nudis, apice calathidia gerentibus valde congesta, numero sæpe 5—6; bracteis foliaceis calathidiis æquilongis vel iis brevioribus. Calathidia sessilia, quam maxime conferta, 7—9-flora (sec. cl. GLEASON 5—8-flora). Involucrum subcylindricum, 6 mm longum, 3 mm latum, basi rotundato-attenuatum, squamis 5—6-seriatis orthostichiis sæpe conspicuis, exterioribus lanceolato-deltoidis, brevibus, carinatis, minute mucronulatis, intermediis lanceolatis, brevissime acuminatis, valde carinatis, intimis ligulato-lanceolatis, obtusiusculis, omnibus firmulis, convexulis, sordide brunneolis, inferne glabris, nitentibus, ad apicem tenuissime puberulis. Pappi setæ interiores subpersistentes, numero 40, firmulæ, paullulo complanatæ, brunneæ, 4,5 mm longæ, quam exteriores lineares, inæquilongæ, perspicuæ circ. 6-plo longiores. Corolla 6—6,5 mm longa, albida (REHDER), tubo angusto, cylindrico, superne glanduloso, in limbum subito abeunte, long. vix $\frac{1}{2}$ corollæ, limbi laciniis firmulis, patulis-recurvis, apice subtus papillosis. Antheræ 2,2 mm longæ, ligula long. $\frac{1}{6}$ antheræ, satis subito contracta, nervo medio conspicuo, auriculis elongatis, obtusis. Stylus longe exsertus. Achænium (immaturum) 1,8 mm longum, dense appresso-sericeum.

Baccharis myrsinites GRISEBACH, 1861, p. 366, p. p. — non PERS.

Vernonia pluvialis GLEASON, 1913, p. 312.

Vernonia proclivis GLEASON, 1913, p. 312.

Vernonia reducta GLEASON, 1913, p. 313.

Hab. in Jamaica: MACNAB (KU, fragm. spec. herb. Kew); PURDIE (KU, fragm. spec. herb. Kew); Blue Mountain Peak, Sept. 1885, MORRIS n. 2120 (KU); HART n. 1070 (KU); in summo monte »Blue Mountain Peak», 2190 m. alt., 11. 2. 03, A. REHDER sine num. (KU); Morcís Gap, in silvis humidis, alt. 1500 m, 12. 7. 03, GEO. NICHOLS n. 20 (K).

A species of very peculiar habit due chiefly to the densely clustered heads on long naked peduncles, and to the sub-cylindrical involucres with their peculiarly imbricated scales. In fact, it resembles somewhat a *Baccharis*, to which genus it was referred by GRISEBACH.

Prof. URBAN, who was the first to realize the Vernonian nature of the plant, described it in manuscript as a particular

species, *V. brachypoda* URB., but afterwards published it as *V. acuminata* (URBAN, 1903, p. 391), apparently considering it to be a highland form of this species. GLEASON in his »Revision» is of the same opinion: »LESSING's *V. acuminata* is described with aggregated heads, resembling NICHOLS 20 and 120, a character possibly due merely to the habitat, since the latter grew in an altitude of 5000—7400 feet». In his »Studies», however, he does the species abundant justice, describing it under three different names, *V. pluvialis*, *V. proclivis* and *V. reducta*. Though I have not seen authentic specimens of these three species, I do not doubt that they are only forms of one species. The differences given by GLEASON are merely inconsiderable ones, based on the shape of the leaves and the number of flowers in the heads. *V. pluvialis* is said to have (5—)8-flowered heads and oblong-ovate to sub-rhomboid leaves, 3—5 cm long, 1,1—1,9 cm wide, *V. proclivis* has 8-flowered heads and elliptic-oblong leaves, which are 6—8 cm long and 2—3 cm wide, *V. reducta* is described as having 5-flowered heads and narrowly elliptic-oblong leaves, 4—4,5 cm long by 1,2—1,6 cm wide. The specimens examined by me, clearly belonging to one single, although rather variable, species, show the following data as to the characters in question:

REHDER	9 fl.,	leaves	3,5 cm	long,	1,65 cm	wide.
HART	7 »	»	3,2 »	»	1,3 »	»
NICHOLS 120	9 »	»	3,3 »	»	1,3 »	»
MORRIS 2120	7 »	»	3,4 »	»	0,9 »	»
MACNAB	— »	»	5,7 »	»	1,5 »	»

It will be seen that there is considerable variation as to the width of the leaves, their shape varying accordingly from oblong-rhomboid with very shortly attenuate base to rhomboid-lanceolate with long-attenuate base. As to the number of flowers I never found heads with only five, though I examined NICHOLS 120 cited by GLEASON under *V. pluvialis*.

The three species of GLEASON were all collected in the higher mountains of Jamaica, partly in the same localities — one of the numbers cited, BRITTON n. 3851, is quoted both under *V. pluvialis* and under *V. proclivis*. It seems, therefore, highly probable that the three species, in fact, constitute one single, though very variable, species.

Vernonia rigida Sw.

Tabula nostra III, fig. 1 (inflorescentia).

Conyza rigida SWARTZ, 1788, p. 113.*Vernonia rigida* SWARTZ, 1806, p. 1322; DE CANDOLLE, 1836, p. 49; GRISEBACH, 1861, p. 354, syn. omnibus exclusis.*Vernonia fruticosa* GLEASON, 1906 b, p. 182 — haud *V. fruticosa* (L.) Sw.

Pappi setæ interiores persistentes, numero 25—30, firmæ, crassiusculæ, paullulo complanatæ, brunneæ, quam exteriores distinctæ lanceolato-spathulatæ circ. 6-plo longiores. Flores desunt. Achænia tenuiter sericeo-pubescentia.

Hab. in Jamaica boreali: in montibus calcareis, petrosis rarius, SWARTZ (H, K, M, Prodr, S, orig. spec., U, herb. THUNB.).

The species has, as far as I know, only been collected by SWARTZ.

The problem of the affinities of this species has caused botanists much trouble. SWARTZ himself, in describing it, supposed it to be closely allied to *V. fruticosa* (L.) Sw., which, however, was not correct. GRISEBACH, in his Flora, referred to it not only *V. fruticosa*, but also the species of the subsection *Sagréanæ*, together with *V. emarginata* WIKSTR.! GLEASON at first followed GRISEBACH, identifying in his »Revision» *V. rigida* and *V. fruticosa*, and placing them among the *Sagréanæ*. Recently he has found that *V. rigida* is another species than *V. fruticosa*, and that it is not to be placed to his *Sagréanæ*. However, he does not mention anything about the affinities of the species, authentic specimens of which he has not seen.

Having abundant material at hand of the species in question, it was an easy matter for me to ascertain that *V. rigida* Sw. is quite different both from *V. fruticosa*, *V. emarginata*, and *Vernoniæ Sagréanæ*. Its relationships, however, still remained questionable, until in an examination of the unnamed Compositæ of the Stockholm Herbarium I lighted upon a *Vernonia* from the West Indies collected by SWARTZ, and presented by him to the Swedish botanist MONTIN, which *Vernonia* had some characters of *V. rigida* and some of *V. acuminata* LESS. Through this fortunate incident I was enabled to state that the nearest ally of *V. rigida* is *V. acuminata* LESS. A

few words about the characteristics of the plants in question may be of interest.

V. rigida, as described by SWARTZ, is a woody winding shrub having flexuose, densely tomentose branches, rounded, rigidly coriaceous leaves, being 3—4,5 cm long by 2,5—3 cm wide, somewhat shining above, glandulose and finely pubescent beneath, especially on the veins. The tomentum is often more copious towards the margins of the leaves. The cymes are leafy, freely flexuose, the heads distant, sometimes two or three in the axils. The involucre are elongated, up to 15 mm high, infundibular, long-attenuate at base; the scales are imbricated in numerous series, the outer ones deltoid, carinate, nearly glabrous, erect-appressed, the inner ones elongated, spreading, the dry and open involucre thus resembling stars.

The specimen presented to MONTIN agrees in leaf-characters perfectly with *V. rigida*; may be the leaves are a little thinner, and more narrowed, 4 cm long by 2,2 cm wide. It has, further, exactly the same pappus and fruit. However, the involucre are very differently shaped. They are only 6—7 mm high, broadly obconic, shortly attenuate at base, the scales are shorter and more densely pubescent. Probably this is the normal form of *V. rigida*, the type specimens belonging to a form with abnormally elongated involucre. Such *formæ imbricatissimæ* occur not infrequently in South American species, for instance, in *V. oligactoides* LESS., *V. nitidula* LESS., and *V. squamulosa* HOOK. ARN.

Vernonia fruticosa (L.) Sw.

Tabula nostra III, fig. 2, 3 (habitus).

Conyza fruticosa LINNÉ, 1763,*p. 1209.‡

Vernonia fruticosa SWARTZ, 1806, p. 1323; DE CANDOLLE, 1836, p. 65; GLEASON, 1913, p. 315.

Conyza frutescens Cydoinea folio. PLUM. Cat. p. 9; ed. BURM., tab. 95, fig. 1.

Eupatorium frutescens, hederæ terrestris folio, flore purpurascente. PLUM. Cat. p. 9(?).

Frutex vel suffrutex repens (MIGUEL FUERTES), aut erectus circ. metralis (W. BUCH), valde ramosus, ramis sæpe elongatis, divaricatis. Caulis lignosus, teres, strictus, adultus

glaber, novellus breviter albo-tomentosus (MIGUEL FUERTES n. 655), aut indumento nigricante (PICARDA n. 884), æqualiter foliosus. Folia spiraliter enata, patentia, breviter sed distincte petiolata, petiolo tomentoso, 1,5 mm longo; laminæ ovatæ, maximæ 2,3 cm longæ, 1,3 cm latæ, sæpe multo minores, 1,1 cm longæ, 0,8 cm latæ, apice obtusæ, truncatæ vel etiam emarginatæ, basi cordatæ, membranaceæ, integerrimæ, obscure rugosæ vel subplanæ, margine sæpe undulatæ, vix revolutæ, discolores, supra atro-olivaceo-virides, pubescentes, pilis e tuberculis enatis, subtus pilis longis, intricatis albo-floccoso-tomentosæ, haud sericeæ, glandulosæ, costa nervisque utriusque lateris numero 5—6, supra impressis, subtus exsculptis. Inflorescentia cymoso-scorpioidea, cymis aut valde elongatis, cauliformibus, leviter flexuosis, inflorescentiam distinctam vix formantibus, aut brevioribus calathidiis magis approximatis, divaricatis, inflorescentiam formantibus fere 1 dm latam, subplanam; bracteis foliaceis calathidiis multoties longiores aut in exemplis aliis iis æquilongis. Calathidia axillaria, sessilia, remota, 18—21-flora. Involucrum campanulatum, 5—6 mm altum, 5—6 mm latum, squamis circ. 3-seriatis, satis laxis, extimis in speciminibus a cl. MIGUEL FUERTES lectis deltoideo-subulatis, conspicue carinatis, deflexis, interioribus erectis, breviter acutatis, obscure carinatis, extimis in a speciminibus ceteris anguste deltoideis, subappressis, obscurius carinatis, intimis lanceolatis, brevissime acuminatis, omnibus firmulis, subglabris, brunneo-nitentibus. Pappi setæ interiores subpersistentes, numero 25—30, crassiusculæ, paullulo complanatæ, 4 mm longæ, albæ, quam exteriores distinctæ lanceolato-spathulatæ circ. 7-plo longiores. Corolla purpureo-violacea, 5 mm longa, tubo amplo, sensim dilatato, glabro, long. $\frac{3}{5}$ corollæ, limbi laciniis apice subtus papillois. Antheræ 2 mm longæ, ligula enervi, brevi, fere $\frac{1}{8}$ long. antheræ, auriculis obtusis. Stylus corollæ fere æquilongus. Achænium crasse cylindricum, 1,5 mm longum, glandulosum, sericeo-pilosum, pilis brevibus appressis, costis perspicuis.

Hab. in Hispaniola: sine loc. acc., PICARDA n. 146 (KU); prope Pétionville, anno 1889, PICARDA n. 884 (KU); Darant (Terreneuve) prope Gonaïves, locis siccis, alt. 600 m, Nov. 1900, BUCH n. 522 (KU); in locis apertis montium, alt. 350 m, Nov. 1910, MIGUEL FUERTES n. 655 (KU); in

prov. Barahona, año 1911, MIGUEL FUERTES sine num. (KU).

Another *Vernonia*, the history of which begins with PLUMIER and SURIAN. Like *V. arborescens* (L.) Sw., it was figured in PLUM. ed. BURM., and on this figure LINNÆUS based his *Conyza fruticosa*. Since there was no specimen of it preserved, its identity remained mysterious to botanists, and the name *V. fruticosa* (L.) Sw. has been applied to many West Indian species, recently to *V. rigida* Sw. (GLEASON, 1906 b, p. 182), SWARTZ himself comparing this species with *V. fruticosa*. It was not until PICARDA recollected it about the year 1889 that Prof. URBAN was able to identify the species, as shown by the remarks on the labels of the specimens in the KRUG-URBAN Herbarium. In fact, there can be no doubt that this identification is correct. Especially MIGUEL FUERTES n. 655 agrees perfectly with the figure in PLUM. ed. BURM. There is moreover not a word in the description to that figure, PLUM. ed. BURM. p. 83, that does not apply to our plant. Its phrase name »*Conyza frutescens*, *Cydoniæ folio*» is singularly apposite, the leaves resembling throughout those of *Cydonia vulgaris* L., their pubescence being nearly the same. BURMANN's particular phrase name (or diagnosis?) of the plant: »*Conyza foliis ovatis, caule fruticoso, floribus axillaribus solitariis, sessilibus*» and his description: »*Planta fruticosa, ramulis flexuosis, a folio ad folium eleganter inclinat. Folia alterna, obtusa, undulata, venosa. Flores solitarii in quavis ala sessiles*» are apparently made from PLUMIER's figure, giving no character beyond this, and consequently agreeing perfectly with our plant.

V. fruticosa is hitherto only found in the south-western part of Hispaniola, where it appears to be rather frequent. Its nearest allies are the *Vernoniæ* of Jamaica, as also some species of eastern Cuba, especially *V. calophylla* GLEASON.

Though the material at hand is not abundant, it indicates a certain variability of the species. Two fairly distinct forms can be distinguished. One is represented by the plants collected by MIGUEL FUERTES. It has long, leafy cymes not forming a distinct inflorescence; the scales of the involucre are acute and elongated. The second form has smaller leaves, shorter cymes with more approximated heads and bluntish scales. It appears to be the common one. Possibly the two

plants, though not separated in leaf-characters, constitute each one species. Additional material is necessary in order to decide this question.

***Vernonia parvuliceps* EKMAN n. sp.**

Tabula nostra III, fig. 9 (inflorescentia).

Suffrutex vel herba perennis, erecta, superne ramosa. Caulis (cujus pars superior tantum adest) teres, diam. 3 mm, dense breviterque cremeo-tomentosus, pilis intricatis, torquatis, æqualiter foliosus. Folia spiraliter enata, patentia, distincte petiolata, petiolo ad 4 mm longo, tomentoso; laminæ ovato-lanceolatae, ad 5 mm longæ, 1,8 cm latæ, basi rotundatæ vel cuneato-rotundatæ, apice acuminatæ, membranaceæ, leviter rugosæ, margine planæ vel novellæ revulatæ, integerrimæ, discolores, supra olivaceo-virides, glabræ, læviusculæ, subtus dense breviterque cremeo-tomentosæ, costa nervisque utriusque lateris numero 7—8, supra impressis, subtus pulchre exsculptis. Inflorescentia cymoso-scorpioidea, subcontracta, cymis patulis, arcuatis, 4—5 cm longis, circ. 10-cephalis; bracteis foliaceis, inferioribus calathidiis 3—4-plo longioribus, superioribus eadem fere æquantibus. Calathidia sessilia, conferta, parva, circ. 21-flora. Involucrum campanulatum, basi rotundatum, 3 mm altum, 3—4 mm latum, squamis 4-seriatis, arcte imbricatis, erecto-appressis, exterioribus brevibus, deltoideis—lanceolato-deltoideis, carinatis mucronulatisque, interioribus lanceolato-linearibus, breviter acuminatis, vix carinatis, omnibus stramineo-brunneis, arachnoideo-pubescentibus. Pappi setæ interiores subcaduæ, numero fere 25, crassiusculæ, albæ, 3 mm longæ, exterioribus perspicuis, late linearibus fere 5-plo longiores. Corolla purpurascens, 5 mm longa, tubo angusto, cylindrico, glabro, long. $\frac{3}{5}$ corollæ, limbi laciniis apice subtus papillosis. Antheræ 1,3 mm longæ, ligula nervosa long. $\frac{1}{6}$ antheræ, auriculis obtusis. Stylus corollam æquans. Achænium (immatuum) 1 mm longum, dense sericeum, pilis brevibus, erectis, appressis, costis glandulisque vix perspicuis.

Hab. in Cuba: WRIGHT n. 2788 (Bss, DC, G, K, orig. spec., KU, P).

The specimens seen of this very striking species are quite uniform, and appear to be collected in the same locality.

It is puzzling that GLEASON did not see this species well represented in herbaria, or that it has not been collected by the active Cuban explorers. In fact, it is one of the easiest recognized species of the *Arborescentes*-group and, once seen, impossible to overlook. Among the species known to me it has no near allies. According to the description, however, *V. vicina* GLEASON approaches somewhat to our plant, but is distinguished by its larger involucre, which are said to be »about 5—6 mm high». Probably there are other differences, but it is not easy to obtain an exact idea of *V. vicina* from GLEASON's description.

Vernonia vicina GLEASON.

Vernonia vicina GLEASON, 1913, p. 317.

Hab. in Cuba: Oriente, Camp la Gloria, prope Sierra Moa, 24—30.12.10, SHAFER n. 8202.

I have seen no specimens of this species. From the description it comes near to *V. parvuliceps*, but has broader leaves and larger heads.

Vernonia calophylla GLEASON.

Vernonia calophylla GLEASON, 1913, p. 317.

Hab. in Cuba: Oriente, Camp la Gloria, prope Sierra Moa, 24—30.12.10, SHAFER n. 8102.

Not seen. The species seems to be a fairly well-marked one, related to the preceding, but differing in its obtuse, sub-rotund leaves.

Vernonia yunqueensis GLEASON.

Tabula nostra III, fig. 6 (folium et calathidium).

Vernonia yunqueensis GLEASON, 1906 b, p. 191; 1913, p. 327.

Pappi setæ interiores subdeciduæ, numero fere 25, crassiusculæ, paullulo complanatæ, albidæ, quam exteriores distinctæ circ. 5-plo longiores. Corolla glabra, tubo ut videatur long. $\frac{1}{2}$ corollæ. Antheræ 2,4 mm longæ, ligula long. $\frac{1}{5}$ antheræ, auriculis obtusis. Achænia dense sericeo-pubescentia.

Hab. in Cuba: Baracoa, in monte El Yunque, ad rupes, Mart. 1903, L. M. UNDERWOOD et F. S. EARLE n. 661 (KU, fragm. orig. spec.).

A very curious species, differing from other *Arborescentes* in the characters of the inflorescence, which is described as follows: »heads about 5, sessile or nearly so in a terminal capitate cluster». I have only seen a small fragment of the type specimen, and I therefore cannot ascertain the relationships of the species. As to the floral characters, however, it agrees exactly with the species allied to *V. fruticosa*.

Vernonia leptoclada SCH.-BIP.

Tabula nostra III, fig. 5 (cyma).

Vernonia leptoclada SCHULTZ-BIPONTINUS, 1863, p. 133.

Vernonia Wrightii GRISEBACH, 1866, p. 144 — non SCH.-BIP.

Vernonia gnaphalifolia GLEASON, 1906 b, p. 178 — non A. RICH.

Vernonia neglecta GLEASON, 1913, p. 318.

Pappi setæ interiores subcaduæ, numero 20—25, crassiusculæ, paullulo complanatæ, albidæ, quam exteriores distinctissimæ circ. 5-plo longiores. Corolla 8 mm longa, glabra, tubo $\frac{2}{3}$ corollæ long., glandulo uno alterove instructo, limbi laciniis subtus papillois apice pilo uno alterove interdum instructis. Antheræ 1,7 mm longæ, ligula fere enervi $\frac{1}{6}$ long. antheræ, auriculis apice obtusiusculis.

Hab. in Cuba: WRIGHT n. 1309 (Bss, CD, orig. spec., sub num. falso 285, D, DC, G, K, KU, P); Loma del Jagüey, Mart. 1889, EGGERS n. 4982 (K, KU, P).

Through the interchange of labels already mentioned, the name of this species has been applied to the plant called *V. Wrightii* SCH.-BIP. in this paper. The species here dealt with has been called, vice versa, *V. Wrightii*. GLEASON, in his »Revision», identified it, erroneously, with *V. gnaphalifolia* A. RICH., and having observed his mistake, in his »Studies» named it *V. neglecta*.

The species is easily recognized by its bullate, densely tomentose leaves and by the elongated cymes, bearing many distant, small heads. It is related to *V. pineticola* GLEASON, as well as to *V. calida* GLEASON and *V. semitalis* GLEASON. The material at hand is fairly uniform, except for the shape of the leaves, which vary from lanceolate, acute, 4,5 cm long,

1 cm wide (EGGERS n. 4982), or lanceolate, obtuse, 7,5 cm long, 2,4 cm wide (WRIGHT n. 1309 p. p.) to ovate, acuminate, 3,8 cm long by 1,6 cm wide (WRIGHT n. 1309 p. p.).

***Vernonia pineticola* GLEASON.**

Tabula nostra III, fig. 7 (calathidium et folia).

Vernonia pineticola GLEASON, 1906 b, p. 176.

Pappi setæ interiores crassiusculæ, paullulo complanatæ, albidæ, quam exteriores distinctæ circ. 6-plo longiores. Flores in specimini mihi commisso desunt.

Hab. in Cuba: Baracoa, in pinetis, Mart. 1903, L. M. UNDERWOOD et F. S. EARLE n. 1341 (KU, fragm. orig. spec.).

Only a small fragment of this species has been seen. It is closely related to *V. leptoclada* SCH.-BIP., but differs abundantly in the larger involucre with elongated, spreading, sub-filiform scales.

***Vernonia calida* GLEASON.**

Vernonia calida GLEASON, 1913, p. 318.

Hab. in Cuba: Oriente, inter Sabanilla et Yamuri Arriba, 30. 1, 1. 2. 11, SHAFER n. 8408.

Not seen. From the description it appears to be a good species, chiefly distinguished from *V. leptoclada* by its contracted inflorescence.

***Vernonia semitalis* GLEASON.**

Vernonia semitalis GLEASON, 1913, p. 319.

Hab. in Cuba: Oriente, ad viam inter Rio Yamanigüey et Camp Toa, 22—26. 2. 10, SHAFER n. 4176.

This species seems to be related to the preceding one, differing above all in its nearly glabrous involucre. I did not see any specimen of this.

5. The allies of *V. membranacea* GRISEB.*Vernonia membranacea* GRISEB.*Tabula nostra* IV, fig. 3, (inflorescentia).*Vernonia membranacea* GRISEBACH, 1866, p. 144; GLEASON, 1906 b, p. 180.

Pappi setæ interiores persistentes, numero 40, tenues, filiformes, pallide brunneæ, quam exteriores minutissimæ circ. 14-plo longiores. Corolla 5,8 mm longa, tubo long. $\frac{1}{2}$ corollæ, sensim dilatato, glandulis nonnullis instructo, limbi laciniis apice subtus papillois. Antheræ 1,6 mm, longæ, ligula $\frac{1}{6}$ long. antheræ, nervo medio conspicuo, auriculis acutis.

Hab. in Cuba: WRIGHT n. 490 (G, orig. spec., KU, sine num.); prope Bahia Honda, prov. Pinar del Rio, 18—19. 12. 10, WILSON n. 9426 (KU).

A well-marked species, which seems to be very rare. As GLEASON remarks, its leaves greatly resemble those of *V. albicaulis* PERS. But the scales of the involucre are very different, broad, greenish-brown with stramineous margin and nearly glabrous. Structurally, it comes very near to *V. gnaphalifolia* A. RICH., and is, in fact, closely related to that species, but only slightly so to *V. albicaulis*.

Vernonia desiliens GLEASON.*Vernonia desiliens* GLEASON, 1913, p. 316.

Hab. in Cuba: Oriente, Arroyo del Medio, ad rupes prope ripam rivuli, alt. 450—550 m, 20. 1. 10, SHAFER n. 3232.

I have seen no specimens of this species. From the description it seems to be a good one, coming near to *V. membranacea*, from which it differs in having the leaves »closely gray-tomentose» beneath. As to the characters of the pappus it agrees very well with *V. membranacea*: »pappus light brown, the inner series 6 mm long, minutely barbellate, the outer series 0,5 mm. long, somewhat paler» (GLEASON, 1913, p. 316).

***Vernonia crassinervia* WRIGHT ap. GLEASON.**

Tabula nostra IV, fig. 2 (habitus).

Vernonia arborescens SW. var. *divaricata* GRISEBACH, 1866, p. 144 — non aliis locis.

Vernonia crassinervia WRIGHT ap. GLEASON, 1906, p. 180.

Pappi setæ interiores subpersistentes, numero 30, tenues, filiformes, albidæ, quam exteriores minutæ circ. 12-plo longiores. Flores in speciminibus visis desunt.

Hab. in Cuba: WRIGHT n. 2787 (Bss, G, K, P).

This imperfectly known species is very closely related to *V. gnaphalifolia* A. RICH., chiefly differing in its very low stature and reduced inflorescence. In my notes from the Paris Herbarium I have written as to *V. crassinervia*: »Strongly resembling *V. gnaphalifolia*. Perhaps differing constantly in the acute leaves. Veins not prominent beneath. Scales elongated, pappus whiter.»

***Vernonia gnaphalifolia* A. RICH. ap. SAGRA.**

Tabula nostra IV, fig. I (inflorescentia).

Vernonia gnaphalifolia A. RICH. ap. SAGRA, 1850, p. 34; GLEASON, 1913, p. 310.

Vernonia sublanata GLEASON, 1906 b, p. 177.

Vernonia angustata GLEASON, 1913, p. 309.

Pappi setæ interiores persistentes, numero 40, tenues, filiformes, albidæ, quam exteriores indistinctæ, lineares circ. 10-plo longiores. Corolla 5,5 mm longa, glabra, tubo sensim dilatato long. $\frac{3}{4}$ corollæ, extus glandulis nonnullis instructo, limbi laciniis apice dorso papillois. Antheræ 1,4 mm longæ, ligula subnervi long. $\frac{1}{5}$ antheræ, auriculis breviter acutatis.

Hab. in Cuba: prope Havana, ex herb. PAVON (Bss); ex herb. RICHARD, leg. RAMON DE LA SAGRA, sine num. (KU, P, orig. spec.); RAMON DE LA SAGRA n. 42 (Prodr), n. 53 (Prodr), n. 59 (P); prope Havana, in campis siccis, Dec. 1890, MORALES n. 12 (KU); ad Vedado prope Havana, Oct. 1890, TORRALBAS n. 40 (KU); Madruga, in saxosis, 28. 3. 03, N. L. BRITTON, E. G. BRITTON et J. A. SHAFER n. 784 (KU, dupl. orig. spec. *V. sublanatae* GLEASON); prov. Havana, Guanabacoa, Loma de la Yota, locis humidiusculis, Jan. 1912, BROTHER LEON et P. WILSON n. 11635 (KU); prov. Santa Clara, ad rupes, 8—9. 4. 12, N. L. BRITTON et J. F. COWELL n. 13322 (KU).

Having attributed the name *V. gnaphalifolia* to the plant here called *V. leptoclada* SCH.-BIP., GLEASON could find no name for the genuine *V. gnaphalifolia*, and consequently in his »Revision» described it as a new species, *V. sublanata* GLEASON. Prof. URBAN, however, called his attention to the fact that *V. sablanata* was identical with *V. gnaphalifolia*, and enabled GLEASON to correct his mistake himself.

The species is rather variable, both as to the shape of the leaves and the density of their pubescence. In the »Revision» GLEASON described a variety *angustata* of the species, having narrowly oblong leaves. This variety he raises to specific rank in his »Studies». I remember having seen elsewhere this variety, though I find no notes about it in my lists. It is, however, not probable that it is a species. The shape of the leaves varies strongly in all Vernoniæ. If species were to be based only upon leaf-characters, hundreds of species could be described on the West Indian material. Evidently there must be other characters combined with the different shape and nervature of the leaves to warrant the rank of a particular species. I imagine that GLEASON will fail to give these for his *V. angustata*.

6. The allies of *Vernonia sericea* L. C. RICH.

Vernonia commutata EKMAN n. sp.

Tabula nostra IV, fig. 4 (habitus).

Suffrutex, certe 3,5 dm altus. Caulis (cujus pars superior tantum adest) inferne simplex, superne ramosus, lignosus, 2 mm. diam., teres, striatus, tenuiter appresso-pubescent, inferne nudus, superne foliatus. Folia alterna, patentia, subsessilia vel breviter petiolata, petiolo 1—2 mm longo; laminæ lanceolato-lineares, 4,5 cm longæ, 0,4—0,5 cm latæ, basi sensim attenuatæ, apice acutæ, membranacæ, integerrimæ, margine revolutæ, supra rugulosæ, tuberculis sæpe piliferis scabræ, subtus in nervis appresse strigoso-pubescentes, in areolis crebriter aureo-glanduloso-punctatæ, costa nervisque utriusque lateris numero 12—15, supra leviter impressis, subtus exsculptis. Inflorescentia cymoso-scorpioidea, ovalis, satis laxa, diffusa, cymis elongatis, divaricatis, maximis 1 dm longis, 4—8-ce-

phalis, calathidiis satis remotis, bracteis suffultis foliaceis, iisdem duplo longioribus. Calathidia sessilia, axillaria, solitaria, circ. 18-flora. Involucrum late infundibuliforme, 5 mm altum, 7—8 mm latum, squamis circ. 4-seriatis, satis laxis, achænia non plane tegentibus, extimis brevibus, deltoideis, brevissime mucronulatis, intermediis lanceolato-deltoideis, intimis lineari-deltoideis, omnibus erectis, appressis, acutis, subglabris, brunneo-nitidulis. Receptaculum planum, nudum. Pappi setæ interiores persistentes, numero circ. 35, tenues, filiformes, 4 mm longæ, albæ, quam exteriores oblongo-ligulatæ distinctæ 8-plo longiores. Flores in speciminibus visis fructus tempore collectis desunt. Achænia cylindrica, ad 2 mm longa, sericeo-pubescentia, pilis erectis, subappressis, glandulis paucis, aureis munita, costis perspicuis.

Vernonia remotiflora GRISEBACH, 1862, p. 511; 1866, p. 144 (*forma angustifolia*) — non L. C. RICH.

Vernonia araripensis GLEASON, 1906 b, p. 181; 1913, p. 308 — non GARDN.

Hab. in Cuba: WRIGHT n. 286 (Bss, D, DC, G, K, KU, orig. spec.).

The new species is related to *V. angustissima* WRIGHT ap. EKMAN and *V. stenophylla* LESS., but at once distinguished by its broader leaves, which are green beneath, not sericeous as in those species.

Collected already by WRIGHT, the species was identified by GRISEBACH with *V. remotiflora* L. C. RICH., a very different, annual plant, never found in the West Indies. GLEASON refers it to *V. araripensis* GARDN. Perhaps he has arrived at this by identifying the species with *V. tricholepis* GRISEBACH (not DC!) 1861, p. 354, which is said by BAKER, 1873, p. 69, to be identical with *V. araripensis*. In fact, GLEASON cites *V. tricholepis* GRISEB. as a synonym to his *V. araripensis*. However, *V. tricholepis* GRISEB. is not our plant, nor is it identical with *V. araripensis* GARDN., which still remains as a plant of Brazil.

Vernonia angustissima WRIGHT ap. EKMAN n. sp.

Tabula nostra VI, fig. 4 (habitus).

Herba perennis, suffruticosa. Caulis (cujus pars superior tantum adest) ultra 4 dm altus, inferne lignosus, diam. 2,5 mm,

simplex, teres, striatulus, inferne subglaber, superne tenuiter appresso-tomentosus, cortice obscure fusco, densiuscule foliatus. Folia alterna, patentia, sessilia; laminæ lineares, ad 4 cm longæ, 1,5—3 mm latæ, basi attenuatæ, apice breviter acuminatæ, membranaceæ, integerrimæ, margine revolutæ, discolors, supra atro-virides, tuberculato-scabræ, pubescentes, subtus pilis densis, appressis sericeo-tomentosæ, costa supra immersa, subtus exsculpta, nervis obscuris. Inflorescentia cymoso-scorpioidea, ambitu late ovata, diffusula, sublaxa, cymis divaricatis, leviter arcuatis, simplicibus, ad 1 dm longis, 3—10-cephalis, calathidiis spatio 1—1,5 cm longo disjunctis, bracteis foliaceis suffultis iis duplo—triplo longioribus. Calathidia sessilia, axillaria, solitaria, circ. 21-flora. Involucrum late infundibuliforme, 6 mm altum, explanatum 1 cm latum, squamis 3—4-seriatis, erectis, appressis, laxis, extimis brevissimis deltoideo-linearibus, mucronatis, intermediis lanceolato-linearibus, intimis linearibus, acutis, basi dorso pallidis, superne violaceo-viridibus, margine pallidioribus, appresse pubescentibus, glandulis aureis, sessilibus sparse punctatis. Receptaculum planum, nudum. Pappi setæ interiores persistentes, numero 45, satis tenues, filiformes, albidæ, quam exteriores lineari-lanceolatæ circ. 12-plo longiores. Corolla 5 mm longa, glabra, tubo sensim dilatato long. $\frac{3}{4}$ corollæ, limbi laciniis subtus apicem versus breviter papillosis. Antheræ lineares, 1,5 mm longæ, ligula long. $\frac{1}{7}$ antheræ, auriculis sensim acutatis. Achænia (immatura) dense sericeo-pubescentia, costis indistinctis.

Vernonia remotiflora GRISEBACH, 1866, p. 144, p. p. — non L. C. RICH.

Vernonia stenophylla GLEASON, 1906 b, p. 181, p. p.; 1913, p. 308, p. p. — non LESS.

Vernonia angustissima WRIGHT in sched. herb. GRISEBACH, nunc Goettingen.

Hab. in Cuba: WRIGHT n. 2786 (Bss, DC, G, orig. spec., K, KU, P, S).

In general habit this species greatly resembles *V. stenophylla* LESS., only differing in the broader inflorescence with elongated, spreading cymes. The principal distinction is based upon the floral characters. *V. stenophylla* LESS. has the corollas divided to the middle of their length, rather short, linear-lanceolate anthers with elongated ligula and shortly acumi-

nated basal lobes; the outer series of bristles is $\frac{1}{8}$ in length of the inner one; *V. angustissima* has the corollas divided only to one fourth of the length, the anthers are linear with short ligula and long-acuminated basal lobes; further the outer series of bristles is only $\frac{1}{12}$ of the inner one. These structural differences are such as do not occur in one species, hardly in the same group of species. This fact together with the existence of a certain difference in habit (GLEASON remarks, 1906 b, p. 181: »The single specimen examined — WRIGHT n. 2786 — does not agree in every particular with LESSING's description»), and with the different distribution has induced me to propose this new species.

Vernonia corallophila GLEASON.

Vernonia corallophila GLEASON, 1913, p. 309.

Hab. in Cuba: Oriente, Guantanamo Bay, in ripa maritima ad rupes corallineo-calcareas, 17—30. 3. 09, BRITTON n. 1939.

Not seen. The species comes near to *V. angustissima* and *V. stenophylla*, but differs from both in its small leaves and few-flowered heads.

Vernonia stenophylla LESS.

Tabula nostra V, fig. 1 (habitus).

Vernonia stenophylla LESSING, 1831, p. 667; DE CANDOLLE, 1836, p. 50; GLEASON, 1906 b, p. 181, p. p.; 1913, p. 308, p. p.

Cacalia stenophylla KUNTZE, 1891, p. 971.

Pappi setæ interiores persistentes, numero 55, tenues, filiformes, albidæ, quam exteriores circ. 12-plo longiores. Corolla 4,5 mm longa, glabra, tubo long. $\frac{1}{2}$ corollæ, limbi laciniis apice subtus papillois. Antheræ lanceolato-lineares, 1,1—1,3 mm longæ, ligula $\frac{1}{5}$ long. antheræ, auriculis satis brevibus, obtusiusculis vel breviter acuminatis.

Hab. in Hispaniola: ad rivulum »Rivière froide», Maj. 1827, JACQUEMONT (B, ex herb. KUNTH, orig. spec., P); in collibus prope Port au Prince, EHRENBURG n. 213 (B); PICARDA n. 539 (KU); in »Morne Bonpère» prope Gonaïves, locis siccis, mense Junio 1901, BUCH n. 713 (KU); prov. Bara-

hona, Las Salinas, in ripa fluminis, alt. 100—150 m, Sept. 1911, MIGUEL FUERTES n. 1392 (KU).

Two forms can be distinguished with the material at hand, one having very long-mucronated leaves and sparingly pubescent involueral scales, which are conspicuously carinate and margined. So BUCH n. 713. The other form, to which all other specimens seen belong, inclusive of the type of the species, has very shortly, or not at all, mucronated leaves and densely pubescent, obsoletely margined scales. Additional material will certainly show that there are forms connecting these two extreme types.

It is an interesting fact that there are forms of *V. sericea* subsp. *racemosa*, TÜRCKHEIM n. 2905, 2906, showing such resemblances to *V. stenophylla* that they might be taken for this species, were not the pappus brown instead of white.

Vernonia sericea L. C. RICH.

Tabula nostra IV, fig. 5 (folium et cyma).

Vernonia sericea L. C. RICHARD, 1792, p. 112 (sphalm. 105), quoad typ. et descr., haud quoad patriam — non auct. al.

Vernonia arborescens PERSOON, 1807, p. 404, fide CASSINI; LESSING, 1829, p. 302; DE CANDOLLE, 1836, p. 48 — non SW.

Lepidaploa phyllostachya CASSINI, 1823, p. 16.

Vernonia Berteriana DE CANDOLLE, 1836, p. 52.

Conyza portoricensis BERTERO in sched. ap. DE CANDOLLE, 1836, p. 52.

Vernonia arborescens SW. β *Lessingiana* GRISEBACH 1861, p. 353.

Vernonia tricholepis GRISEBACH 1861, p. 354 p. p. — non DC.

Cacalia sericea KUNTZE, 1891, p. 971, quoad typum.

Vernonia phyllostachya GLEASON, 1906 b, p. 176; URBAN, 1911, p. 619.

Vernonia venusta GLEASON, 1906 b, p. 177; URBAN, 1911, p. 619.

Pappi setæ interiores persistentes, numero 45—50, tenues, pallide brunneæ, rarissimæ albidæ—stramineæ, exterioribus distinctis circ. 10-plo longiores. Corolla 5 mm longa, tubo angusto, glaberrimo, long. $\frac{3}{4}$ corollæ, limbi laciniis apice subtus papillois. Antheræ 0,8 mm longæ, ligula long. $\frac{1}{6}$ antheræ, auriculis breviter acutatis.

Hab. in Porto Rico: BAUDIN n. 292 (P, herb. JUSSIEU, verisimiliter spec. orig. *Lepidaploæ phyllostachyæ* CASS.); LEDRU (Prodr, sub nom. *V. arborescentis* SW.); BERTERO (B, Prodr, orig. spec. *V. Berterianæ* DC); PLÉE n. 205 (P); SCHWANECKE n. 95 (KU); BARBIER, anno 1847 (? P); prope Maya-

güez, anno 1874, KRUG n. 593 (KU); ibidem, anno 1875, KRUG n. 592 (KU); prope Bayamon, Dec. 1883, STAHL n. 237 (KU); ibidem, Dec. 1886, STAHL n. 621 (KU); pr. Maricao ad Montoso, 20. 11. 84, SINTENIS n. 389 (KU); pr. Maricao in convalli fluminis, 22. 11. 84, SINTENIS n. 390 (D, K, KU); pr. Mayagüez in monte Mesa, 29. 12. 84, SINTENIS n. 390 b (B, KU); pr. Bayamon in pratis ad »Pueblo viejo», 28. 3. 85, SINTENIS n. 1154 (KU); pr. Aibonito ad Algarrobo, 2. 12. 85, SINTENIS n. 2936 (DC, KU); prope Coamo in monte Santana, 28. 12. 85, SINTENIS n. 2936 b (KU); pr. Yauco in monte Duey, 5. 2. 86, SINTENIS n. 3632 (KU); pr. Sabana grande in fruticetis ad ripam flum. Estero, 2. 3. 86, SINTENIS n. 3929 (B, KU); pr. Rincon in silvula ad »Barrio del Pueblo», 1. 12. 86, SINTENIS n. 5522 b (KU); pr. Rincon in montibus ad Puntas, 11. 12. 86, SINTENIS n. 5642 (KU); pr. Utuado in fruticetis ad »Los Angeles», 17. 1. 87, SINTENIS n. 5915 (D, KU); pr. Utuado ad margines silvarum circa Santa Isabel, 8. 2. 87, SINTENIS n. 6145 (KU); HELLER et HELLER, anno 1899, n. 84 (K), n. 183 (KU); »25 kilom. n. o. Mayagüez», alt. 325 m, 1. 2. 1900, HELLER n. 4472 (KU); ad viam inter Adjuntas et Ponce, 27. 11. 02, HELLER n. 6136 (D, KU, fragm. orig. spec. *V. venustæ* GLEASON); coll. haud. not. (P); coll. haud. not. ex herb. VENTENAT (D). — St. Thomas: L. C. RICHARD (P, »frequens in montibus apricis incultis S:ti Thomæ et in S:to Joanne»); RIEDLÉ (P); HORNBECK (S); EHRENBERG n. 9 (B); FRIEDRICHSTHAL n. 99 (CD); KREBS (H, S); OERSTED (H, sub nom. *V. remotifloræ* L. C. RICH.); OERSTED n. 1, 12 (K); HJALMARSSON (S); pr. hospitium marinorum, 2. 12. 74. EGGERS, sine num. (H); pr. »Mafolie Gut», 22.6.76, EGGERS, sine num. (KU); Aug. 1880, EGGERS n. 301 (KU); in monte Signal Hill, alt. 460 m, Nov. 1880, EGGERS n. 301 (B, BB, K, M, P); Jun. 1882, EGGERS, sine num. (KU); ad Bolongo, Oct. 1885, EGGERS n. 128 (H, M); ibidem, Dec. 1886, EGGERS n. 128 (H); in silva, alt. 300 m, Febr. 1887, EGGERS sine num. (L); sine loc. acc., RAUNKLÆR n. 3156, 3157 (H); ad Croun (?), 9. 5. 06, RAUNKLÆR n. 3160 (H); coll. haud. not. ex herb. SCHWÄGRICHEN (M). — St. Jan: L. C. RICHARD (P, »frequens in arvis campestribus, collibus apricis insularum S:ti Thomæ et S:ti Joannis — diversis anni temporibus florens»); BENZON (H); HORNBECK (H); Great Mahó Bay, 24. 12. 87, EGGERS n. 3050 (H, KU); sine loc. acc., 13. 2. 06, RAUNKLÆR n. 3158 (H); 24. 2. 06, RAUNKLÆR n. 3159 (H); 21. 3. 06, RAUN-

KIÆR n. 3161 (H). — St. Croix: WEST (H, S); PFLUG (H); BENZON (H, S); RAVN (H); in collibus pr. »Elizas Retreat», Maj. 1871, EGGERS. sine num. (H). — sine loc. acc.: LEBLOND n. 337 (D, orig. spec. *V. sericea* L. C. RICH. vel eius dupl.); ex Mus. Paris. (B); RIEDLÉ (D); ex herb. ZUCCARINI (M); ex herb. SCHMIEDEL. (M); ex herb. PAVON (Bss).

In the year 1792 L. C. RICHARD described, very briefly, some plants sent by Mr. LEBLOND from Guyana to the Société d'Histoire Naturelle of Paris. Among these plants there was a *Vernonia* which RICHARD called *Vernonia* (err. *Veronia*) *sericea*, and characterized as follows: »fol. lineari-lanceolatis, subtus sericeo-incanis, ubique tomentosis, subintegris: floribus alternis, secundis sessilibus albis». This description, of course, is too narrow to characterize a *Vernonia*, and it seems therefore as if nobody has been able to identify the species. By chance (at least so it appears) the name *V. sericea* was applied to a plant common at Rio de Janeiro, although this did not agree with the description, and was never collected in Guyana.

When, in the summer of 1912, I examined the Vernoniæ of the DELESSERT Herbarium at Geneva, I found a specimen of what, at that time, I called *V. phyllostachya* (CASS.) GLEASON, labelled *Vernonia sericea* RICH., LEBLOND n. 337. At first, I could not understand the meaning of this determination, but I soon was able to ascertain that the plant in question was the type, or a duplicate of the type, of the mysterious *Vernonia sericea* L. C. RICH.

The brief description of *V. sericea* quoted above will be found to agree perfectly with *V. phyllostachya* (CASS.) GLEASON, except for the colour of the flowers. However, typically purple-flowered Vernoniæ very often occur with white flowers. Further, the type locality of *V. sericea* is indicated to be Guyana, but *V. phyllostachya* has never been collected there. It often happened, however, in that early age of Botany that the habitats of plants described were interchanged. Since LEBLOND also collected in the West Indies (compare URBAN, Notæ biographiæ, Symb. Antill., Vol. 3) it is therefore evident that this plant came from there, and not from Guyana.

Singularly enough I could not find at Paris any specimen of *V. sericea* collected by LEBLOND.

The species thus renamed is one of the most richly represented in herbaria. It is easily recognized by its sericeous

leaves and brown pappus. Analytically, it is characterized especially by its very small anthers. It varies somewhat as to the shape and pubescence of its leaves. Specimens from Porto Rico (SINTENIS n. 389, 390 e) represent the most narrow-leaved form (dimensions of the leaves: $7,5 \times 0,5$ cm), which is at the same time the most densely pubescent; specimens from St. Jan (RAUNKJÆR n. 3158) have very wide and thinly pubescent leaves (dimensions: 11×5 cm).

The variety mentioned by URBAN, 1911, p. 619: »Var. foliis obovatis vel ellipticis, apice obtusis vel rotundatis. An species propria?», SINTENIS n. 4749, is most probably a hybrid between *V. sericea* L. C. RICH. and *V. albicaulis* PERS. (compare $\asymp$ *V. Gleasonii* EKMAN, on p. 54 of this paper).

A remarkable variety of *V. sericea* having white pappus was described by GLEASON in his »Revision» as a distinct species, *V. venusta*. I have been able to examine a specimen with white pappus, SINTENIS n. 390 b in the Berlin Herbarium, which agrees perfectly with the small portion of type specimen of *V. venusta* seen. Now, no other difference than that of the colour of the pappus could be found to exist between *V. sericea* and *V. venusta*, even on the most careful analysis. Moreover, intermediate specimens have been seen, having stramineous or brownish-stramineous pappus, for instance, SINTENIS n. 390 b in the KRUG-URBAN Herbarium, SINTENIS n. 3929 in the Berlin Herbarium. I cannot see any reason for not reducing GLEASON's species.

Specimens of *V. sericea* L. C. RICH. collected by OERSTED in St. Thomas have been referred to *V. remotiflora* L. C. RICH. and recently cited as that species from the West Indies (GLEASON, 1906 b, p. 175). True *V. remotiflora* does not occur there at all.

Another specimen of *V. sericea* labelled »Jamaica, PURDIE», but certainly not collected there, has been identified by GRISEBACH as *V. tricholepis* DC. (GRISEBACH, 1861, p. 354), and by BAKER in Flora Brasiliensis as *V. araripensis* GARDN. Neither species occurs in the West Indies.

The geographical range of the species extends over Porto Rico, St. Thomas, St. Jan and St. Croix. It has also been indicated from Hispaniola. However, the plant in question in some points differs from the type of the species, and I have

found these differences striking enough to warrant its assignment as a subspecies of *V. sericea*:

subsp. **racemosa** (DELPONTE) EKMAN n. subsp.

Tabula nostra V, fig. 4 (habitus).

Folia quam in specie tenuius pubescentia, subtus sordide grisea, raro subglabra; inflorescentia magis contracta, cymis brevioribus; squamæ involucri brevius acuminatæ, subviolaceo-brunnæ. Pappi setæ interiores 35—45 exterioribus 8-plo longiores. Antheræ 1,2 mm longæ.

Vernonia racemosa DELPONTE, 1854, p. 396.

Hab. in Hispaniola: SWARTZ (S); POITEAU (B); EHRENBERG n. 9 (B, p. p.), n. 150 (B); PICARDA n. 145 (KU); prope Cadets, anno 1889, PICARDA n. 883 (KU); prope Miragoane, Jan. 1891, PICARDA n. 189 (KU); prope Santiago in Questa da Piedra, alt. 300 m, EGGERS n. 2370 (K, KU); prope Santiago in silva ad Lopez, alt. 350 m, 8. 6. 87, EGGERS n. 2370 b (KU); ad Morne Bellance prope Gonaïves, in silvis apertis, alt. 600 m, Oct. 1901, BUCH n. 832 (KU); prope Constanza in pinetis, alt. 1200 m, Febr. 1910, TÜRCKHEIM n. 2905 (D, KU, M); prope Constanza ad ripam rivuli, alt. 1190 m, Febr. 1910, TÜRCKHEIM n. 2906 (Br, KU, S).

Though in its typical forms well distinguished from *V. sericea*, the subspecies cannot always be recognized on habitual characters only. Especially the specimens collected by SWARTZ, which WIKSTRÖM took to be *V. divaricata* Sw., strongly resemble *V. sericea*. Yet I think the larger anthers will prove to be a good analytical character of the subspecies. Its particular distribution may prevent confusion with *V. sericea*.

The material at hand is extraordinarily heterogeneous. An exclusive type is TÜRCKHEIM n. 2905 with narrowed, revolute leaves (dim. $4 \times 0,3$ — $0,5$ cm) and very dense inflorescence. The plant collected by BUCH has leaves resembling those of *V. albicaulis* PERS. or *V. membranacea* GRISEB., and unusually evolved floral branches.

All specimens seen from Hispaniola have been found to belong to the subspecies except MAYERHOFF in 1852 (B). However, this plant may have been collected in another island,

for instance, in St. Thomas. This supposition is made more probable by the fact that another *Vernonia*, *V. albicaulis*, which certainly does not live in Hispaniola, is in the Berlin Herbarium labelled: MAYERHOFF, Sto. Domingo in 1852. It represents the form of *V. albicaulis* common in St. Thomas.

The type specimen of *V. racemosa* DELPONTE has not been examined. Since the description of this species agrees exactly with the Hispaniolan plant, and the type was collected there (by BERTERO), there can be no doubt as to its identity.

In the LAMARCK Herbarium at Paris there is a specimen of the subspecies labelled: »*Conyza* de Mr. DE BADIER, de la Guadcloupe, n. 44». In the Prodromus Herbarium, however, the same label is affixed to *V. arborescens* Sw. β . *ovatifolia* DC., i. e. to *V. albicaulis* PERS. — a fact illustrating how plants have been confused in ancient times.

5. The allies of *Vernonia segregata* GLEASON.

Vernonia segregata GLEASON.

Tabula nostra V, fig. 3 (inflorescentia).

Vernonia segregata GLEASON, 1913, p. 327.

Hab. in Cuba: Oriente, Camp la Gloria, prope Sierra Moa, 24—30. 12. 10, SHAFER n. 8051 (KU).

I have seen only very imperfect portions of this puzzling species. It is readily recognized by its peculiar inflorescence: capitate clusters of heads subtended by bracteal leaves, the clusters both terminal and axillar. As to the leaves and the involucre it recalls the species near to *V. havanensis* DC., viz. *V. hieracioides* and *V. cubensis*, but differs widely in the inflorescence.

Subsect. *Scorpioides*.

Frutices elati, sæpe scandentes. Folia lata, sæpe magna, basi sæpe contracto-attenata. Inflorescentia cymoso-scorpioidea, cymis elongatis, multifloris, simplicibus vel parce dichotome ramosis, calathidiis sessilibus. contiguis; bracteis nullis. Ca-

lathidia parva. Receptaculum margine alveolarum lacerato-fimbriatum. Pappi setæ interiores persistentes, firmulæ, fili-formes aut paullulo complanatæ, numero 30—40, albidæ, exte-riores distinctæ. Corolla glabra, aut limbi laciniis dorso pilosis. Antheræ 1,2—2,4 mm longæ, ligula long. $\frac{1}{3}$ — $\frac{1}{5}$ antheræ. Achæ-nia tenuiter pubescentia.

To this subsection I refer four species, *V. scorpioides* (LAM.) PERS., *V. brachiata* BENTH., *V. megaphylla* HIERON., and a new species from the eatingas of Bahia, collected by ULE, n. 7236. *V. brachiata* and *V. megaphylla* are closely allied, as are *V. scorpioides* and the new species from Bahia. In the West Indies only *V. scorpioides* occurs. It is found there in the islands of Tobago, Trinidad and Margarita, the flora of which greatly resembles that of South America.

Vernonia scorpioides (LAM.) PERS.

Tabula nostra VI, fig. 2 (inflorescentia).

Conyza scorpioides LAMARCK, 1786, p. 88.

Vernonia scorpioides PERSOON, 1807, p. 404; LESSING, 1829, p. 282; 1831, p. 658; DE CANDOLLE, 1836, p. 41; SCHULTZ-BIPONTINUS, 1847, p. 510; GRISEBACH, 1861, p. 353; BAKER, 1873, p. 101; GLEASON, 1906 b, p. 193.

Vernonia subrepanda PERSOON, 1807, p. 404.

Vernonia tournefortioides HUMBOLDT, BONPLAND, KUNTH, 1820, p. 34; LESSING, 1829, p. 281; 1831, p. 657; DE CANDOLLE, 1836, p. 41.

Lepidaploa scorpioides CASSINI, 1823, p. 16.

Vernonia centriflora LINK et OTTO, 1828, t. 55.

Stachelina solidaginoides WILLDENOW herb. ap. LESSING, 1829, p. 281.

Vernonia flavescens LESSING, 1831, p. 657; DE CANDOLLE, 1836, p. 41.

Chrysocoma repanda VELLOZO, 1825, p. 306 (sec. ed. NETTO); 1827, vero edita 1835, t. 13.¹

Vernonia longeracemosa MART. ap. DE CANDOLLE, 1836, p. 42.

Vernonia lanuginosa GARDNER, 1846, p. 219.

Vernonia cincta GRISEBACH, 1879, p. 162.

Cacalia cincta KUNTZE, 1891, p. 969.

Cacalia scorpioides KUNTZE, 1891, p. 971.

Cacalia tournefortioides KUNTZE, 1891, p. 971.

¹ The first edition (1825) of the descriptions to VELLOZO's *Flora flumi-nensis* is an extremely rare work. It was reprinted in 1881 (in *Archivos do Museu Nacional do Rio de Janeiro*). The plates to the descriptions, the well-known *Floræ fluminensis Icones*, were not to be had in European libraries before 1835. From the descriptions it is quite impossible to identify the plants concerned. Like OTTO KUNTZE I prefer to consider the species of VELLOZO as published in the year 1835.

Pappi setæ interiores numero 30, persistentes, tenues, filiformes, albidæ, exterioribus subfiliformibus, distinctis circ. 5-plo longiores. Corolla fere 6 mm longa, tubo glabro, sensim dilatato, long. $\frac{2}{3}$ corollæ, limbi laciniis dorso plus minusve pilosis, pilis longis, erecto-appressis. Antheræ 2 mm longæ, ligula $\frac{1}{3}$ — $\frac{1}{4}$ long. antheræ, auriculis brevibus, obtusis.

Hab. in Tobago: prope Frenchfield in silv. mont. juxta Hope River, alt. 600 m, solo argillaceo, 26. 10. 89, EGGERS n. 5615 (K, KU, P); in collibus ad Bacolet, 19. 11. 89, EGGERS n. 5885 b (KU); Kings bay, alt. 60 m, 26. 4. 96, SEITZ n. 47 (KU); Spring Road prope Scarborough, 12. 3. 09, BROADWAY n. 3080 (KU). — Trinidad: Cedros, ad ripam maris, 14. 1. 08, BROADWAY n. 2168 (KU, S). — Margarita: El Valle, 20. 7. 01, MILLER et JOHNSTON n. 134 (KU); ibidem, 30. 7. 01, MILLER et JOHNSTON n. 133 (KU); »Juan Griego trail», 2. 6. 03, JOHNSTON n. 323 (KU). — Insuper in America australi a Nicaragua usque ad Uruguay divulgata.

A variable, though always easily recognized, species, abundantly represented in all herbaria. The West Indian specimens agree throughout with South American ones. The synonyms cited all belong to South American specimens, and should be discussed in a work on the *Vernoniæ* of the corresponding regions.

Subsect. Pallescentes.

Suffrutex erectus. Folia membranacea, elliptica, basi longe attenuata, apice longe acuminata, glabra, margine remote dentata. Inflorescentia cymoso-scorpioidea, cymis elongatis, sparse dichotome ramosis, calathidiis parvulis, sessilibus, remotis; bracteis nullis. Involucrum infundibuliforme, squamis pauciseriatis, acutiusculis, extimis patulis, interioribus erectis. Receptaculum subalveolatum, subnudum. Pappi setæ interiores persistentes, numero 50, tenues, filiformes, brunneæ, quam exteriores valde indistinctæ, inæquilongæ, filiformes vulgo 8-plo longiores. Corolla 5 mm longa, glabra, tubo gracili, cylindrico, in limbum subito abeunte, long. $\frac{3}{5}$ corollæ, limbi laciniis patentibus, dorso apice papillois. Antheræ 1,5 mm longæ, ligula long. $\frac{1}{6}$ antheræ, auriculis obtusis. Achænium tenuissime pubescens.

This subsection includes only one species from St. Vincent. It is distinguished from other West Indian subsections by its

pappus, the bristles of the outer series being extremely indistinct, filiform. In general habit it recalls the *Scorpioides*, from which it differs, at first sight, in the colour of the pappus.

Vernonia pallescens GLEASON.

Tabula nostra VI, fig. 3 (inflorescentia).

Vernonia pallescens GLEASON, 1906 b, p. 192.

De characteribus analyticis, vide supra.

Hab. in St. Vincent: in silvis montium, alt. 600—900 m, Juli. 1899, H. H. et G. W. SMITH n. 922 (K, KU).

From a remark on the label of the specimen cited (KU): »*Vernonia* = St. Vincent, Anderson» it appears as if already ANDERSON had collected the species.

Subsect. *Polyanthes*.

Frutices vel suffrutices sæpissime elati. Folia membranacea, forma et magnitudine varia, indumento numquam sericeo. Inflorescentia cymoso-paniculata, sæpe ampla, pluriflora, rotundata, cymis brevibus, irregulariter ramosis, calathidiis inferioribus sæpe (in spec. antillanis semper) pedunculatis; bracteis nullis. Calathidia parva—mediocria, ad 25-flora. Receptaculum subplanum. Pappi setæ interiores persistentes, filiformes, tenues, exteriores subdistinctæ. Corolla glabra. Antheræ minores. Achænia tenuissime pubescentia.

The subsection thus defined includes a great number of species from the Andes (*V. baccharoides* H. B. K. and its allies), from Brazil (*V. polyanthes* LESS. and its allies), and from Mexico (*V. lanceolaris* DC. and its allies). It matches the species-groups *Deppeanæ* of GLEASON, *V. canescens* H. B. K. excluded, further, his *Havanenses* except *V. pallescens* GLEASON, his *Paniculatae dichotomæ*, and, may be, some of his *Paniculatae umbelliformes*. The West Indian representatives are outlying species of apparently very ancient origin. They may have originated from Columbia, where allied forms still live.

The West Indian species can be divided into two smaller groups, one including *V. havanensis* DC. and its allies, the second *V. menthaefolia* (POEPP.) LESS. To the latter species GLEASON attributes a higher taxonomic rank, making it the

representative of a certain division of the section *Lepidaploa*: *Paniculatae dichotomæ*, according to the structure of its inflorescence. I think GLEASON, having recently come across a member of the *Havanenses* having the same inflorescence, viz. *V. hieracioides* GRISEB. (= *V. Orientis* GLEASON, 1913), will not now deny the relationship between *V. menthaefolia* and *Vernoniae havanenses*. In fact, *V. havanensis* highly resembles *V. menthaefolia*, and some specimens of it can only be distinguished from that species by the characters of the petioles. *V. havanensis* and its allies, *V. cubensis* GRISEB. and *V. hieracioides* GRISEB., have the leaves attenuate into the petioles, the upper ones even without distinct petioles, while in *V. menthaefolia* all leaves have very distinct, often very long petioles. As to the structure of the involucre and flowers, etc., no differences have been found between *V. menthaefolia* and the *Vernoniae havanenses*.

Conspectus specierum hujus subsectionis.

- I. Folia basi in petiolum brevem, sæpe indistinctum attenuata. Species *V. havanensi* DC. proximæ.
 - A. Folia tenuiter membranacea, subglabra, sublævia. Calathidia ultra 18-flora. Involucrum 6—7 mm altum. Pappi setæ albæ. Corolla 7—8 mm longa. Antheræ circ. 3 mm longæ. *V. havanensis* DC.
 - B. Folia firmula, laxissime induta, scabriuscula. Calathidia infra 14-flora. Involucrum 3—5 mm altum. Pappi setæ brunnescentes. Corolla 6—6,5 mm longa. Antheræ circ. 2 mm longæ.
 1. Folia anguste rhomboideo-elliptica, indumento brunnescente, vix nitida. Inflorescentia vulgo habitu scorpioidea, cymis elongatis, multifloris, divaricatis, calathidiis brevius pedunculatis. Calathidia 11—14-flora. Squamæ involucri appressæ, obtusiusculæ vel breviter acuminatæ, sat molles. *V. cubensis* GRISEB.
 2. Folia obovata vel late elliptica, rigida, nitidula, indumento nigricante. Inflorescentia habitu paniculata, cymis brevibus, paucifloris, calathidiis primariis longe pedunculatis. Calathidia 6—7

(5—10)-flora. Squamæ exteriores patulæ, firmæ, omnes conspicue cuspidatæ.

V. hieracioides GRISEB.

- II. Folia basi in petiolum semper distinctum subito contracta. Inflorescentia ei *V. hieracioidis* similis. Calathidia magnitudine *V. havanensis*. *V. menthaefolia* (POEPP.) LESS.

1. The allies of *V. havanensis* DC.

Vernonia havanensis DC.

Tabula nostra V, fig. 6, 7 (inflorescentiæ).

Vernonia havanensis DE CANDOLLE, 1836, p. 37; GLEASON, 1906 b, p. 192; 1913, p. 329.

Vernonia stictophylla WRIGHT, 1869, p. 176.

Cacalia havanensis KUNTZE, 1891, p. 970.

Pappi setæ interiores persistentes, numero 40—50, filiformes, tenues, quam exteriores lineares, breves 12—15-plo longiores. Corolla circ. 8 mm longa, tubo glabro, sensim dilatato, long. $\frac{2}{3}$ corollæ, glandulis sessilibus, globuliformibus obsito, limbi laciniis apice subtus papillois, longitudinaliter striatis. Antheræ 3—3,3 mm longæ, ligula enervi long. $\frac{1}{6}$ antheræ, auriculis attenuatis, obtusiusculis.

Hab. in Cuba: RAMON DE LA SAGRA, n. 11 (P), n. 37 (Prodr), n. 67 (P, Prodr), n. 247 (P), n. 279 (Prodr), n. 331 (Prodr); LINDEN n. 45 (CD); WRIGHT n. 1306 (KU, fragm. inflorescentiæ), n. 2792 (Bss, K, una cum *V. menthaefolia* LESS., P); Loma pelada, in silvis humidis, umbrosis, WRIGHT n. 3596 (?) (K, KU).

The numerous specimens collected by RAMON DE LA SAGRA agree well with each other and with WRIGHT n. 2792 in the Kew Herbarium. The specimen from Loma Pelada, which is the *V. stictophylla* WRIGHT, appears to be only a shade form of the species, being collected in »damp, shady woods». It has greenish involucres, those of genuine *V. havanensis* often being purple-tinged.

GLEASON in his Revision made no distinction between the three species of *Vernoniæ havanenses*. I suppose he had not seen the genuine *V. hieracioides* GRISEB. at that time. In his »Studies» he has three genuine *Vernoniæ havanenses*, viz. *V. havanensis* DC., *V. Ottonis* SCH.-BIP. and *V. Orientis* GLEASON.

Notwithstanding the different names, his species are the same as here accepted, recognized already by GRISEBACH. I scarcely venture to suppose, that his remark under *V. havanensis*: »The specimens at hand fall into two groups, the first with leaves long-attenuate at base, almost sessile, and thin in texture; the second with leaves cuneate into a distinct petiole, and firm in texture», should be due to some confusion with *V. menthaefolia*; but this species can greatly resemble *V. havanensis*.

Vernonia cubensis GRISEB.

Tabula nostra V, fig. 2 (folium et inflorescentia).

Vernonia cubensis GRISEBACH, 1866, p. 144.

Vernonia Ottonis GLEASON, 1913, p. 330 — non SCH.-BIP.

Pappi setæ interiores persistentes, numero 30—35, filiformes, tenues, sordide stramineæ, quam exteriores anguste lineares 6-plo longiores. Corolla 6—6,5 mm longa, tubo sensim dilatato, glabro, long. $\frac{2}{3}$ corollæ, glandulis sessilibus, globuliformibus paucis prædito, limbi laciniis subtus glandulis instructis. Antheræ 2,1 mm longæ, ligula long. $\frac{1}{6}$ antheræ, nervi, auriculis attenuatis, obtusiusculis.

Hab. in Cuba: WRIGHT n. 1306 (KU, S); n. 2791 (Bss, DC, G, orig. spec., KU, P); prov. Pinar del Rio, prope Pinar del Rio, 24. 10. 04, BAKER et ABARCA n. 3421 (KU); prov. Pinar del Rio, prope Guane, in palmetis, 1—4. 12. 11, SHAFFER n. 10646 (KU).

GLEASON applies (1913, p. 330) to this species *V. Ottonis* SCH.-BIP., as well as *V. hieracioides* GRISEB. However, the type specimen of the former is typical *V. menthaefolia* (POEPP.) LESS., and the latter is the same as *V. Orientis* GLEASON. WRIGHT's number 1306 includes both *V. cubensis* GRISEB. and *V. hieracioides* GRISEB. Probably the specimens so numbered in the GRAY Herbarium, which was consulted by GLEASON, are all *V. cubensis* GRISEB.

The three species of *Vernonia havanenses* are by no means very good ones. *V. cubensis* GRISEB. in many respects is intermediate between *V. havanensis* DC. and *V. hieracioides* GRISEB. Some of the specimens cited above are suspected not to be quite correctly determined.

Vernonia hieracioides GRISEB.

Tabula nostra V, fig. 5 (habitus).

Vernonia hieracioides GRISEBACH, 1862, p. 511.*Cacalia hieracioides* KUNTZE, 1891, p. 970.*Vernonia Orientis* GLEASON, 1913, p. 330.

Pappi setæ interiores persistentes, numero 35, filiformes, tenues, stramineæ, quam exteriores latæ, distinctæ circ. 10-plo longiores. Corolla 6 mm longa, tubo glabro, sensim dilatato, long. ultra $\frac{2}{3}$ corollæ, glandulis globuliformibus rarissimis vel nullis, limbi laciniis striatulis, apice subtus papillosis. Antheræ 2,3 mm longæ, ligula brevi, enervi, long. $\frac{1}{7}$ antheræ, auriculis brevissime acuminato-apiculatis.

Hab. in Cuba orientali: prope villam Monte Verde dictam, Jan.—Jul. 1859, WRIGHT n. 1306 (Bss, CD, sub nom. *V. dichroopappæ* SCH.-BIP., D, DC, G, orig. spec., KU, ex herb. GRISEBACH, ex herb. ALEX.-PRIOR, P).

Though I have not seen the type specimen of *V. Orientis* GLEASON, I have identified this species with *V. hieracioides* GRISEB. The most important features of the new species are the particular structure of the inflorescence and the involucre, as well as the few-flowered heads. Now *V. hieracioides* has exactly the same inflorescence and involucre, as shown by the type specimen in the GRISEBACH Herbarium and by its description: »panicula fastigiata aphylla ramis ejus glandulo-pilosiusculis dichotomis vel apice brevissime scorpioides . . . squamis glabriusculis mucronato-acutis patulis». But *V. hieracioides* is said to have 10-flowered heads, and *V. orientis* only 5-flowered ones? However, the type specimen itself was found to have 6—7-flowered heads, and hence I suppose the numbers found by GRISEBACH and GLEASON to be extreme.

2. The allies of ***V. menthaefolia*** (POEPP.) LESS.***Vernonia menthaefolia*** (POEPP. ap. SPR.) LESS.

Tabula nostra VI, fig. 1 (ramus floriger).

Eupatorium menthaefolium POEPPIG ap. SPRENGEL, 1826, p. 412.*Vernonia menthaefolia* LESSING, 1829, p. 268; DE CANDOLLE, 1836, p. 38; GRISEBACH, 1862, p. 510; GLEASON, 1906 b, p. 197; 1913, p. 331.*Vernonia Ottonis* SCHULTZ-BIPONTINUS, 1847, p. 508.*Vernonia Grisebachii* SCHULTZ-BIPONTINUS, 1863, p. 231.

Pappi setæ interiores persistentes, numero 40—50, filiformes, tenues, exterioribus subfiliformibus circ. 12-plo longiores. Corolla 6,5 mm longa, tubo sensim dilatato, glabro, long. $\frac{3}{5}$ corollæ, limbi laciniis subtus apice glandulosis, glandulis parvulis, globuliformibus, sessilibus. Antheræ 2,2 mm longæ, ligula enervi, long. $\frac{1}{6}$ antheræ, auriculis brevissimis, apiculato-acuminatis.

Hab. in Cuba: POEPPIG (B, orig. spec. *Eup. menthifolii* POEPP., Bss, F, KU, P); prope Franqueville, RAMON DE LA SAGRA, sine num. (B); RAMON DE LA SAGRA n. 60 (Prodr), n. 79 (P, Prodr), n. 400 (Prodr), n. 596 (Prodr), sine num. (B); Mr. LÉMAN, anno 1825 (Prodr); prope Catefal Fundador, 17. 1. 39, OTTO n. 35 (B, CD, orig. spec. *V. Ottonis* SCH.-BIP.); READ (K); WRIGHT n. 282 (D, DC, G, KU, P, S), n. 1305 (Bss, DC, KU, S), n. 2792 (Bss, CD, orig. spec. *V. Grisebachii* SCH.-BIP., DC, G, K, KU, P, S); prope Santa Maria, in fruticetis, mense Febr. 1889, EGGERS n. 4626 (B, KU, P); Arroyo Gallego, mense Febr. 1889, EGGERS n. 4647 (KU, M, P); Cieneguita, prope Cienfuegos, 2. 10. 96, COMBS n. 706 (B, K, KU); Colonia Limones prope Cienfuegos, 2. 2. 03, PRINGLE n. 92 (D, KU); prope Havana, 30. 1. 05, CURTISS n. 623 (D, DC, H, K, KU, M); prope Managua, 23. 1. 05, BAKER et ABARCA n. 4456 (KU); prope Santiago de las Vegas, 2. 2. 05, ABARCA n. 4505 (KU); ibidem, 6. 2. 06, BAKER n. 2643 (KU); Camaguey, prope La Gloria, 25. 1. 09, SHAFER n. 28 (KU); prov. Pinar del Rio, inter El Rosario et Los Palacios, ad marginem viæ, 30. 1. 12, SHAFER n. 12030 (KU); prov. Santa Clara, prope »Sancti Spiritus», in fruticetis, 15—24. 2. 12, SHAFER n. 12113 (KU).

By examining the type specimens I have been able to state the identity of the synonyms cited above. *V. Ottonis* SCH.-BIP. was based upon a specimen with very small heads and rounded, tomentose leaves, *V. Grisebachii* SCH.-BIP. represents a form with larger heads and more narrowed, thinly tomentose leaves.

In the Copenhagen Herbarium there is a specimen collected by LIEBMAN, labelled: Mexico: Dep. Oaxaca, Oct. 1842, LIEBMAN n. 356. The locality is clearly an error, and since LIEBMAN also collected in Cuba, the specimen may have originated from that island.

Subsect. *Noveboracenses*.

Suffrutices elati. Folia membranacea sæpe angusta, integerrima vel margine sæpe serrulata. Inflorescentia cymoso-paniculata, plana vel concavo-depressa, ambitu obpyramidata, cymis satis brevibus, exterioribus inferioribus longioribus, sæpe sursum arcuatis; bracteis nullis. Calathidia sæpe majuscula. Involucrum late campanulatum. Receptaculum planum, nudum. Pappi setæ interiores persistentes, numero 40—70, tenues, filiformes, sæpe purpurascens, exterioribus subindistinctis, inæquilongis, anguste linearibus vulgo 8-plo longiores. Corollæ satis longæ, 8—10 mm in speciebus examinatis, glabræ, tubo $\frac{2}{3}$ long. corollæ. Antheræ ultra 3 mm longæ, ligula $\frac{1}{5}$ — $\frac{1}{6}$ long. antheræ, auriculis obtusis. Achænia subglabra.

This subsection includes several Mexican species, and all North American ones. It matches GLEASON's *Paniculatæ veræ*, except his *Alamaniancæ*. It differs from the *Polyanthes* chiefly in its flat or depressed inflorescence, larger corollas and anthers, and nearly glabrous achenes.

Only one West Indian species belongs here, viz. *V. insularis* GLEASON, described as from the Bahama Islands. Evidently the origin of this species can be traced back to Florida, where related species are common.

Vernonia insularis GLEASON.

Vernonia insularis GLEASON, 1906 a, p. 184; 1906 b, p. 226.

Hab. in insulis Baham. Great Bahama, N. L. BRITTON et C. F. MILLSPAUGH n. 2392, 2392 a; BRACE n. 1385. — Abaco: BRACE n. 1835.

I have seen no specimens of this species.

Sect. *Tephrodes* DC.*Vernonia cinerea* (L.) LESS.

Conyza cinerea LINNÆUS, 1753, p. 862.

Vernonia cinerea LESSING, 1829, p. 291.

Pappi setæ interiores valde caducæ, numero circ. 30 (?), tenues, albæ, quam exteriores spathulatæ, fimbriolatæ circ.

10—12-plo longiores. Corolla tenuis, 4,5 mm longa, tubo sensim dilatato $\frac{3}{4}$ long. corollæ, glabro, limbi laciniis dorso apicem versus pilis nonnullis instructis. Antheræ brevissimæ, 0,8 mm longæ, ligula enervi fere $\frac{1}{5}$ long. antheræ, auriculis acutatis.

Hab. in insul. Baham. New Providence, 15. 2. 07, N. L. BRITTON n. 5374 (KU). — Cuba: prov. Pinar del Rio, prope Los Palacios, 3—4. 1. 12, SHAFER n. 11656 (KU.) — Jamaica: Irwin hills, in cultis, anno 1849, WULLSCHLÄGEL n. 885 (M); anno 1850, R. C. ALEXANDER-PRIOR (G); ad Gordonstown, alt. 300 m, 21. 1. 88, EGGERS n. 3421 (Bss, D, KU, P); ibidem, alt. 360 m, 21. 1. 88, EGGERS n. 3421 a (KU); Banana River, alt. 360 m, 21. 1. 88, EGGERS n. 3468 (KU); Hope, 22. 10. 97, HARRIS n. 6865 (KU); Queen Anna's Bay, in margine viarum, 19. 3. 97, CHURCHILL sine num. (KU); in montibus humilioribus prope Kingston, 17. 7. 97, O. HANSEN sine num. (KU). — Hispaniola: prope Port au Prince, Mart. 1892, PICARDA n. 987 (KU); Cap Haytien, 16. 7. 87, EGGERS n. 2843 (KU); prope Labrante, April. 1889, BUCH n. 42 (KU). — St. Thomas: 10. 2. 06, RAUNKIÆR n. 1917 (H). — St. Croix, coll. haud not. (H). — Guadeloupe: Le Baillif, ad ripam maris, anno 1892, DUSS n. 2484 (KU); prope Basse-Terre, anno 1892, DUSS n. 2517 (KU). — Grenada: ad ripam maris frequens, anno 1893, G. W. SMITH n. 106 (KU); 9. 3. 95, BROADWAY n. 432 (KU); St. Georges, Coopers Hill, 4. 3. 05, BROADWAY n. 2542 (D). — Tobago: ad stationem botanicam, 11. 4. 09, BROADWAY n. 2542 (KU, S).

A common, intertropical weed!

Species excluded.

Vernonia chinensis (LAM.) LESSING, Linnæa, Band 6, 1831, p. 105.

Hab. in Guadeloupe: prope Gombegre, locis incultis sparsa, Juni. 1900, DUSS n. 4032.

GLEASON in his »Studies» lists this well-known cosmopolitan species under its old generic name, *Cyanthillium* BLUME, thus indicating the plant to be generically different from *Vernonia*, chiefly because of its very caducous, uniseriate pappus. I agree with him in assigning generic rank to the

plant. As for the specific name used by GLEASON, *C. chinensis* (LAM.), I cannot join him. LAMARCK describes, 1786, p. 83, *Conyza chinensis* as follows: 4. Conise de Chine. *Conyza chinensis*, Lin. » etc. He does not intend to describe a new species, believing himself to have the Linnæan plant before him. Now *Conyza chinensis* L. belongs to a widely different genus, being the type of *Blumea chinensis* DC. LAMARCK made a false identification. I think the specific name *chinensis* cannot therefore be applied to our plant. The name to be used is »*patula*», from *Conyza patula* AIT. (1788). Its correct name would be, then, *Cyanthillium patulum* (AIT.). However, as I have not seen the type of *Conyza patula*, nor studied sufficiently the relations of *Cyanthillium* to *Vernonia*, I do not wish to be responsible for this combination.

***Vernonia lepidota* GRISEBACH, 1866, p. 145.**

Hab. in Cuba: prov. Baracoa, in summo monte El Yunque, 14. 6. 61, WRIGHT n. 2789 (Bss, G, orig. spec., KU).

Receptaculum alveolatam, marginibus alveolarum scariosis, dentatis. Pappi setæ interiores satis caducæ, numero 5—6—7, crassæ, complanatæ, haud tortæ, albidæ, setæ exteriores alte coalitæ, patellam formantes cylindricam, margine laciniosam. Corolla 7—8 mm longa, tubo sensim dilatato, extus glanduloso, long. $\frac{1}{2}$ corollæ, limbi laciniis dorso glandulis instructis, apice recurvis, glandulosis. Antheræ omnino *Vernoniæ*, 2.4 mm longæ, ligula subnervi, crassa, $\frac{1}{5}$ long. antheræ, auriculis brevibus, oblique submarginato-truncatis. Stylus *Vernoniæ*. Achænium compressiusculum, glaberrimum, irregulariter 10-costatum.

As already stated (page 4), this species is to be removed from the genus *Vernonia*, chiefly by the characters of its pappus.

***Vernonia Milleri* JOHNSTON, 1905, p. 698.**

Hab. in Margarita: El Valle, 31. 7. 01, O. O. MILLER et J. R. JOHNSTON n. 254 (KU, dupl. orig. spec.).

The plant clearly belongs to *Oliganthes* CASS.

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Explanation of the Plates.

(All figures are in natural size.)

Plate 1.

- Fig. 1. *Vernonia viminalis* GLEASON. Leaf, lower surface; branch of inflorescence. WRIGHT n. 285 (S).
- » 2. *Vernonia Valenzuelana* A. RICH. Leaf, lower surface. WRIGHT n. 2785 (G).
- » 3. *Vernonia angusticeps* EKMAN n. sp. Leaf, lower surface; branch of inflorescence. WRIGHT n. 282 (DC).
- » 4. *Vernonia inaequiserrata*¹ SCH.-BIP. Leaf, lower surface. WRIGHT n. 285 prior (KU).
- » 5. *Vernonia Sagrana* DC. Leaf, lower surface. WRIGHT n. 281 (G).
- » 6. *Vernonia linguæfolia* EKMAN n. sp. Leaf, lower surface. WRIGHT n. 285 post. (G).
- » 7. *Vernonia aceratoides* GLEASON. Leaf, lower surface. WRIGHT n. 2784 (G).
- » 8. *Vernonia Sprengeliana* SCH.-BIP. Branch of inflorescence. MIGUEL FUERTES n. 1388 (KU).
- » 9. *Vernonia Wrightii* SCH.-BIP. Leaf, lower surface; branch of inflorescence. WRIGHT n. 284 (G).
- » 10. *Vernonia Tuerckheimii* URB. Part of the inflorescence. TÜRCKHEIM n. 2959 (KU).
- » 11. *Vernonia buxifolia* (CASS.) LESS. Flowering branch. TÜRCKHEIM n. 2959 B (KU).

Plate 2.

- Fig. 1. *Vernonia arborescens* (L.) SW. Branch of inflorescence. DUSS n. 305 (KU).
- » 2. *Vernonia bahamensis* GRISEB. Leaf, lower surface; flowering branches. EGGERS n. 3893 (KU).
- » 3. *Vernonia arbuscula* LESS. Flowering branch. CURTISS n. 65 (KU).
- » 4. *Vernonia complicata* GRISEB. Flowering branch. BRITTON n. 2225 (KU).
- » 5. *Vernonia albicaulis* PERS. Leaf, lower surface; flowering branch. RAUNKJÆR n. 1919 (H).
- » 6. *Vernonia divaricata* Sw. Part of the inflorescence. WILSON n. 238 (G).
- » 7. *Vernonia borinquensis* URB. Part of the inflorescence. HELLER n. 4391 (KU).
- » 8. *Vernonia acuminata* LESS. Part of the inflorescence. HARRIS n. 8205 (KU).

Plate 3.

- Fig. 1. *Vernonia rigida* Sw. Flowering branch. SWARTZ (S).
 » 2. *Vernonia fruticosa* (L.) Sw. Upper part of the plant. BUCH n. 522 (KU).
 » 3. *Vernonia fruticosa* (L.) Sw. Branch of inflorescence. MIGUEL FUERTES sine num. (KU).
 » 4. *Vernonia expansa* GLEASON. Inflorescence. HARRIS n. 8796 (KU).
 » 5. *Vernonia leptoclada* SCH.-BIP. Branch of inflorescence. WRIGHT n. 1309 (KU).
 » 6. *Vernonia yunquensis* GLEASON. Leaf, lower surface; a single head. UNDERWOOD et EARLE n. 661 (KU).
 » 7. *Vernonia pineticola* GLEASON. Two leaves, lower and upper surface; a single head. UNDERWOOD et EARLE n. 1341 (KU).
 » 8. *Vernonia pluvialis* GLEASON. Inflorescence. REHDER sine num. (KU).
 » 9. *Vernonia parvuliceps* EKMAN n. sp. Two leaves, upper and lower surface; upper part of the plant. WRIGHT n. 2788 (KU).

Plate 4.

- Fig. 1. *Vernonia gnaphalifolia* A. RICH. Inflorescence. MORALES n. 12 (KU).
 » 2. *Vernonia crassinervia* WRIGHT ap. GLEASON. Upper part of the plant. WRIGHT n. 2787 (G).
 » 3. *Vernonia membranacea* GRISEB. Inflorescence. WRIGHT n. 490 (G).
 » 4. *Vernonia commutata* EKMAN n. sp. Upper part of the plant. WRIGHT n. 286 (G).
 » 5. *Vernonia sericea* L. C. RICH. Leaf, lower surface; branch of inflorescence. EGGERS n. 3050 (H).

Plate 5.

- Fig. 1. *Vernonia stenophylla* LESS. Upper part of the plant. PICARDA n. 539 (KU).
 » 2. *V. cubensis* GRISEB. Leaf, lower surface; upper part of the plant. WRIGHT n. 2791 (KU).
 » 3. *Vernonia segregata* GLEASON. Inflorescence. SHAFER n. 8051 (KU).
 » 4. *Vernonia sericea* L. C. RICH. subsp. *racemosa* (DELP.) EKMAN. Inflorescence. TÜRCKHEIM n. 2905 (KU).
 » 5. *Vernonia hieracioides* GRISEB. Upper part of the plant. WRIGHT n. 1306 (G).

- Fig. 6. *Vernonia havanensis* DC. Branch of inflorescence. WRIGHT n. 1306 (KU).
» 7. *Vernonia havanensis* DC. Inflorescence. WRIGHT n. 3596 (? KU).

Plate 6.

- Fig. 1. *Vernonia menthæfolia* (POEPP.) LESS. Flowering branch. CURTISS n. 623 (H).
» 2. *Vernonia scorpioides* (LAM.) PERS. Inflorescence. SEITZ n. 47 (KU).
» 3. *Vernonia pallescens* GLEASON. Inflorescence. H. H. et G. W. SMITH n. 992 (KU).
» 4. *Vernonia angustissima* WRIGHT ap. EKMAN n. sp. Upper part of the plant. WRIGHT n. 2786 (G).
» 5. *Vernonia tricephala* GARDN. Flowering branch. BROADWAY n. 2174 (KU).

Register.

(Synonyms are in italics.)

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