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Vol. 77, pp. 127-156

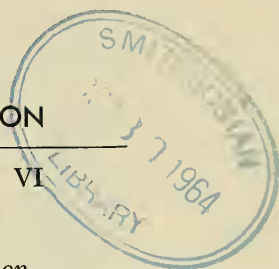
30 October 1964

PROCEEDINGS  
OF THE  
BIOLOGICAL SOCIETY OF WASHINGTON

STUDIES ON ANDEAN COMPOSITAE: VI

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This continuation of my contributions to our knowledge of the Compositae of the Andes deals mainly with interesting collections made by Prof. H. Ellenberg in 1957 in connection with ecological research in several regions of Peru, and with specimens collected by Dr. J. J. Wurdack in his recent explorations of the region of Chachapoyas. Both extensive collections indicate a high degree of affinity between the floras of northern Peru (Jalca region) and the Ecuador-Colombian páramo. A more detailed discussion of these affinities will be presented after completion of the identification of all specimens. Chachapoyas having been the headquarters of Andrew Mathews, Wurdack found many toptype specimens of species based on Mathews' collections, but in his thorough explorations he also encountered a great number of undescribed species. Some of them are described here. A part of the novelties found in the Ellenberg collections of Compositae was published in my contribution IV of this series (*Brittonia* 12<sup>3</sup>, 1960). One of the most interesting findings of Ellenberg is a new genus in the Eupatorieae-Pickerinae, here proposed. An Ecuadorian collection by Barclay is also considered here.

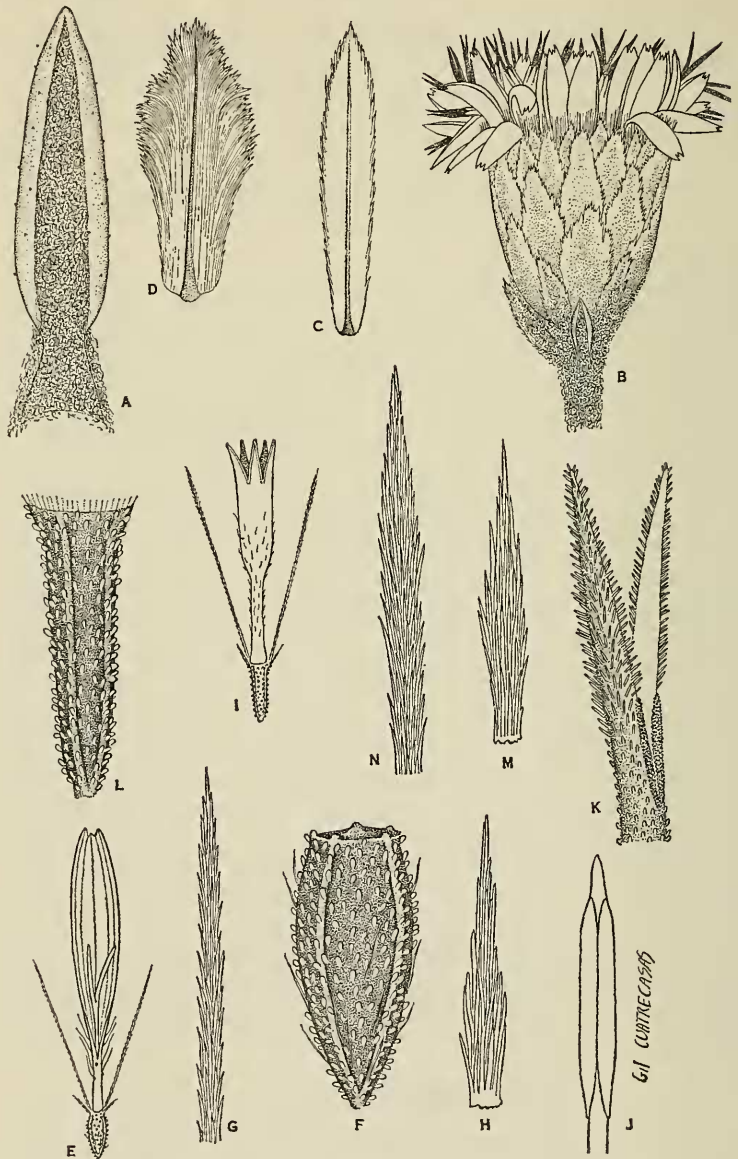
The work upon which this paper is based has been sponsored by the National Science Foundation. The preceding article of this series was published in the same Proceedings, vol. 74: 7-28, 1961.

***Diplostephium barclayanum* Cuatr., sp. nov.**

Frutex ad 1 m altus ramis erectis terminalibus crasse denseque albolanatis.

Folia alterna coriacea, lamina lineari-lanceolata apice brevissime

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calloso-acutata basi subbite rotundata in brevem petiolum 1.5 mm longum membranaceum amplectentem angustata margine crasse revoluta 5–8 mm longa 1.5–2.6 mm lata; supra viridi nitida sublaevi sed minutis tuberculis spinulosis parcis munita tantum costa impressa notata; subtus dense crasseque albo-lanata, nervatione cum crasso indumento velati.

Capitula heterogama radiata pedunculata circa 1.5 cm diametentia 8–12 corymbos terminales simplices vel subsimplices erectos robustos formantia. Pedunculi 1.5–2.5 cm longi crassiusculi erecti crasse denseque albo-lanati parcis foliis sparsis brevibus 5–3 mm longis supremis bractei-formibus subscariosis lanceolatis lanatis 3–2 mm longis, ad involucrium juxtapositis.

Involucrium campanulatum basi turbinatum circa 6–7 mm altum scariosum basi albido-lanuginosum; phyllariis circi 6-seriatis obtusis stramineis scariosis late marginato-laceratis interioribus glabris circa 6–6.5 mm longis 1.2–1.7 mm latis, mediis gradatim brevioribus oblongis et ovatis 5–4 mm longis 2 mm latis basilaribus late triangularibus dorso lanatis infimis 4–3 mm longis 2 mm latis. Flores radii feminei 22–25 uniseriati; corolla circa 9 mm longa alba tubulo 2 mm longo sursum longe hispido pilis rigidis erectis ad 2 mm longis sparsis glandulis globosis intermixtis, lamina oblonga 3-dentata obscure 4–5 nervata 7 mm longa 1.2–1.5 mm lata; rami styli lineari-subulati 1.5 mm longi margine incrassati minute stigmati-papilloso; ovarium basi cuneatum 5-nervatum leviter compressum copiose glandulosum et sparse pilosum circa 1.5 mm longum; pappus stramineus circa 5 mm longis setis rigidulis minute strigulosis apicem versus vix ampliatis 2-seriatis externis brevibus 0.4–0.8 mm longis. Flores disci hermaphroditi 20–23; corolla lutea 6–7 mm longa tubulo angusto 2–2.2 mm longo pilosulo minutis pilis papilloso-crassiusculis alteris longioribus, limbo campanulato-tubuloso pilosulo 5-dentato dentibus triangulari-oblongis 1.2 mm longis margine incrassatis apice acutiusculo plus minusve papilloso-piloso; antherae 2 mm longae basi auriculatae; rami styli 2 mm longi lineari-subulati valde acuti dorso papilloso-hispidulo margine tertio inferiori incrassato papilloso-stigmatico; ovarium oblongum basi cuneatum 5-nervatum copiose glanduloso-granulatum et sparsissimis pilis instructum circa 1.4 mm longum fertile; pappus stramineus 5 mm longus setis biseriatis minute strigulosis sursum paulo dilatatis exterioribus 0.5–0.8 mm longis. Receptaculum

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FIG. 1. *Diplostephium barclayanum*. A, leaf from below,  $\times 7$ ; B, head,  $\times 4$ ; C, inner phyllary,  $\times 7$ ; D, medium-outer phyllary,  $\times 10$ ; E, ray flower,  $\times 5$ ; F, achene from ray flower,  $\times 30$ ; G, upper part of inner pappus bristle in ray flower,  $\times 60$ ; H, outer bristle of same,  $\times 90$ ; I, disc flower,  $\times 5$ ; J, anther,  $\times 20$ ; K, style branches of disc flower,  $\times 25$ ; L, ovary of disc flower,  $\times 25$ ; M, end of inner pappus bristle in disc flower,  $\times 60$ ; N, outer pappus bristle of same,  $\times 90$ . (Barclay & Juajibioy 9046).

circa 2 mm diam. alveolatum marginibus alveolorum dentatis.

*Type:* Ecuador, Prov. Napo-Pastaza: near Cordillera de los Llanganati; Chihuila Sacha o Ainchilibí. Shrub, to 1 m tall. Leaves small, to 5 × 2 mm, white-woolly below. Heads profuse, densely woolly in bud, on woolly stems. Invol. bracts long-ciliate; ligul. fls. white; disc fls. yellow. Occasional, lower part of west-facing, grassy slope, south of high campsite under overhang on Ainchilibí, 3700 m alt., 25–29 August 1959, Barclay and Juajibioy 9046. Holotypus, US.

*Diplostephium barclayanum* belongs to the series *Lavandulifolium* Bl. but the robust flowering branchlets are arranged in erect terminal corymbs. Its obtuse, scariose, lacerate-margined phyllaries, the white rays, and the strongly glandular achenes also distinguish this species from the most closely related *D. hartwegii* Hier., *D. adenachaenium* Bl., and *D. lavandulifolium* HBK.

***Diplostephium callaense* Cuatr., sp. nov.**

Frutex ramosus circa ad 1 m altus ramulis valde patulo-foliatis dense crasseque albo-lanatis, ramis vetustis cortice grisaceo rimoso-lacerato aspectu glabrusculo sed minute piloso. Internodia quam foliis patulis copiosisque valde breviora 1–3 mm longis.

Folia alterna coriacea lineari-oblonga sessilia sensim sine sensu in basin versus angustata apice subite attenuata subacutata breviter calloso-mucronulata, margine crasse revoluta base ampliata-vaginata, 6–15 mm longa 1.5–3 mm lata; supra laete viridia minute copioseque glanduloso-foveolata et resinoso-granulata singulo granulo globoso nitidissimo in singulo foveolo sessile, nervo medio tantum visibile plus minusve ad basin albo-lanato reliqua glabra; subtus dense crasseque albo-lanata tantum costa eminenti plus minusve conspicua.

Capitula heterogama radiata 20 mm diametentia pedunculata solitaria ad terminationes ramulorum, pedunculo erecto obsolete angulato dense albo-lanato 5–10 mm longo 1–1.5 mm diametenti, praecipue sursum paucis bracteolis lanceolatis acuminatis rigidulis supra glabrusculis subtus lanuginosis 2–3 mm longis supremis cum involucrium transientibus. Involucrium 7–8 mm altum semiglobosum ad basin subturbinatum phyllariis subscariosis pallidis circa 5-seriatis, interioribus lineari-lanceolatis vel lanceolatis acutis acuminatisque intus glabris planisque extus costa prominula piloso-araneosis vel subglabris plus minusve glandulosis margine lacerato-ciliatis, 6.5–7.5 mm longis 1–1.6 mm latis, exterioribus triangulari-lanceolatis circa 4.5–5.5 mm longis basi 2 mm latis margine lacerato-ciliatis apice acutissimo longe acuminato dorso sparse granulato-glanduloso et araneoso-lanuginoso, intermediis transientibus, omnibus in sicco recurvatis. Flores radii feminei ligulati circa 24–26 biseriati; corolla alba lineari-elliptica apice tridentata 9–11 mm longa 2.5 mm lata 4–5 nervis plus minusve conspicuis tubo 2.8–3 mm longo, basim lamina extus et tubo sursum sparse papilloso-pilosa interdum glandulosa, cetera glabra; stylus glaber 3–4 mm tubum excedentibus, ramulis 1.2–1.5 mm longis lanceolato-linearibus sub-



obtusiusculis, marginibus incrassatis minutissime papilloso-stigmatiferis; ovarium oblongum 2 mm longum subtriquetrum densiuscule glandulosum et hirsutulum; pappus circa 5 mm longus stramineus, setis rigidulis robustiusculis strigulosis ad apicem paulo ampliatis biseriatis exterioribus 0.6–0.8 mm longis. Flores disci hermaphroditi 34–38; corolla lutea 5.2–5.6 mm longa parte media minute sparseque papilloso-pilosula et glandulosa dentibus triangularibus acutis 0.8–1 mm longis extus parce glandulosis cetera glabra, tubulo circa 2 mm longo limbo tubuloso; antherae circa 2 mm longae saccis basi subacutis auriculatis ramis styli lanceolato-subulatis circa 1.4 mm longis extus margineque dense papilloso-hispidulis; ovarium sterile oblongum strictum circa 2.5 m. longum 4–5-nervatum (nervis plus minusve conspicuis) subcompressum dense hirsutulum et glandulosum. Receptaculum convexo-planum 3–3.5 mm diametente alveolatum marginibus alveolorum argute dentatis.

*Type:* Peru, Dept. Amazonas, Prov. Chachapoyas: Middle eastern Calla-Calla slopes, near Kms. 416–419 of Leimebaba-Balsas road, 2900–3100 m alt., shrub 0.4–1 m, locally frequent; rays white; disc yellow; 9 July 1962, J. J. Wurdack 1266. Holotypus, US (2373649).

*Diplostephium callaense* is closely related to *D. empetrifolium* Bl., from which it differs in its larger, somewhat obovate-oblong leaves (broader in their upper third) which are more minutely foveolate and glandular, the foveolae and glands being smaller and more abundant than on the shorter, strictly linear leaves of the Ecuadorian species. In *D. empetrifolium* Bl. the leaves also are more rigid, spreading, or reflexed, and denser, and the ray-corollas are longer and probably bluish or purplish.

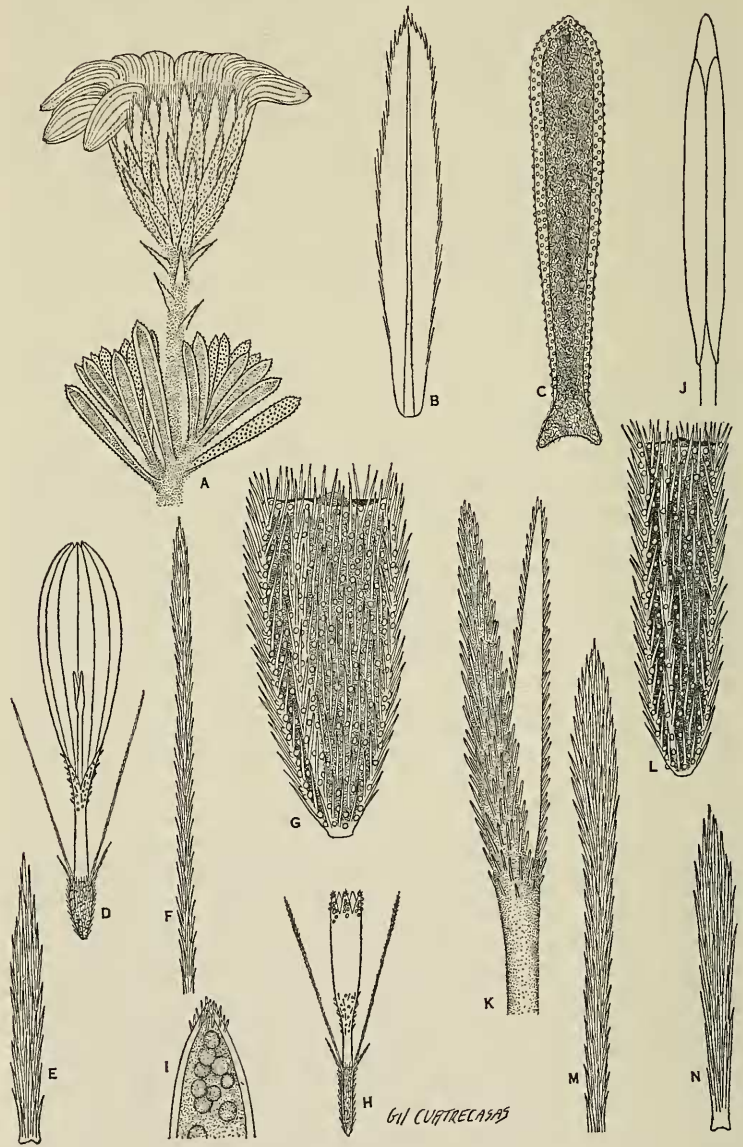
From *D. oblanceolatum* Bl. (a very close relative of *D. glandulosum*), it differs in its smaller and less thick, rigid leaves, in the white rays, and in the glands on the ovary.

From *D. cajamarquillense* Cuatr. it differs in its more rigid, linear leaves that are almost smooth above, and in its hirsute ovaries and violaceous rays.

#### ***Diplostephium konotrichum* Cuatr., sp. nov.**

Arbuscula 4 m alta virgato-ramulosa dense foliosa et floribunda. Ramulis dense lanuginosis ferrugineis pilis pluricellularibus crassis conicis acutis patulis rectis vel hamatis ad 0.5 mm longis copiosis et pilis longissimis tenuibus lanato-intricatis tectis. Ramis vetustis cortice ochraceo vel griseo fissurato-rimoso piloso-tuberculato parce glabrescenti.

Folia alterna coriacea petiolata. Petiolus tener 5–10 mm longus praecipue subtus plus minusve pilosus ad basin in vaginam 2–2.5 mm latam dilatatus. Lamina oblanceolata vel oblanceolato-oblonga apice subacuta saepe minute calloso-mucronulata basi in petiolum sine sensim attenuata margine integra revoluta, 1.5–3 cm longa, 0.5–0.9 cm lata; supra viridis sublaevis juvenile statu parce piloso-arachnoidea demum glabra sed sparsis glandulis minutis globosis munita, nervo medio impresso tantum conspicuo; subtus dense ferrugineo-lanata costa bene



elevata tantum conspicua nervis secundariis 12–14 utroque latere prominentibus patulis cum indumento velatis.

Inflorescentiae corymboso-paniculatae terminales folia suprema excedentes, erectae 3–6 cm diametentes; axi robustiusculo ferrugineo-lanato ramis erectis virgatis teneris extremo ramulosis foliolis subtendentibus inferne foliis similibus sed brevibus superne bracteiformibus linearibus vel subulatis 6–3 mm longis; ramuli ultimi seu pedunculi teneri 3–15 mm longi lanuginosi, ad apicem tantum juxta involucrem 2–4 bracteolis lanceolatis muniti. Capitula heterogama radiata 2 cm diametentia. Involucrem campanulatum circa 6 mm altum 5 mm diametente, phyllariis 4–5 seriatis, interioribus lineari-lanceolatis acutis marginibus sursum eroso-ciliatis dorso glabris viridi-brunnescentibus margine pallidioribus, 5–5.5 mm longis, 1 mm latis, ceteris lanceolatis vel ovato-lanceolatis gradatim brevioribus et amplioribus exterioribus 4–3 mm longis 1.6–1.8 mm latis acutis margine pallidis lacerato-ciliatis dorso apiceque atrobrunneis sparse flexuoso-pilosis et parce papillois. Flores radii femineae ligulati 14–16 uniseriati; corolla lilacina 11–12 mm longa tubulo 3.5–4 mm longo papilloso-piloso, lamina oblonga 4-nervata circa 2 mm lata apice 3-dentata dentibus obtusis basim versus extus parce papilloso-pilosa; stylus 2.5 mm tubum excendens ramis linearibus 1.4 mm longis marginibus incrassatis stigmato-papillois; ovarium oblongum basim attenuatum 4–5 nervatum levissime triangulare compressum, copiose setoso-hispidulum et minute granulato-glandulosum circa 2 mm longum; pappus ruber 6 mm longus biseriatus setis strigulosis inaequilongis extremo paulo ampliatis, exterioribus brevibus latioribus 0.4–1 mm longis. Flores disci hermaphroditii 13–15; corolla lutea 6 mm longa tubulo crassiusculo circa 2 mm longo pilis sparsis crassiusculis limbo tubuloso sursum gradatim leviter ampliatis deorsum parce pilosulo dentibus 1 mm longis oblongo-triangularibus acutis margine incrassatis glabris sed apice minutissime papillois; antherae 2 mm longae basi obtusae; rami styli lineares subulati 1.2–1.4 mm longi extus margineque omnino longe papilloso-hispiduli; ovarium lineare 2.5–3 mm longum 5-nervatum longe hispidum et minute granulato-glandulosum; pappus 6 mm longus ruber setis sursum ampliatis acutis strigilosis inaequalibus biseriatis exterioribus latioribus 0.4–1 mm longis. Receptaculum subplanum alveolatum marginibus alveolorum dentatis circa 2 mm diametente.

*Type:* Peru, Dept. Amazonas, Prov. Chachapoyas: Moist scrub

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FIG. 2. *Diplostephium callaense*. A, end of flowering branchlet,  $\times 2.5$ ; B, inner phyllary,  $\times 7.5$ ; C, leaf from below,  $\times 3.5$ ; D, ray flower,  $\times 5$ ; E, outer pappus bristle,  $\times 60$ ; F, upper part of inner pappus bristle of ray flower,  $\times 60$ ; G, ovary of female flower,  $\times 30$ ; H, disc flower,  $\times 5$ ; I, corolla lobe; J, anther,  $\times 25$ ; K, stylar branches of disc flower,  $\times 40$ ; L, ovary of disc flower,  $\times 25$ ; M, part of inner bristle of disc flower,  $\times 60$ ; N, outer bristle of same. (Wurdack 1966).

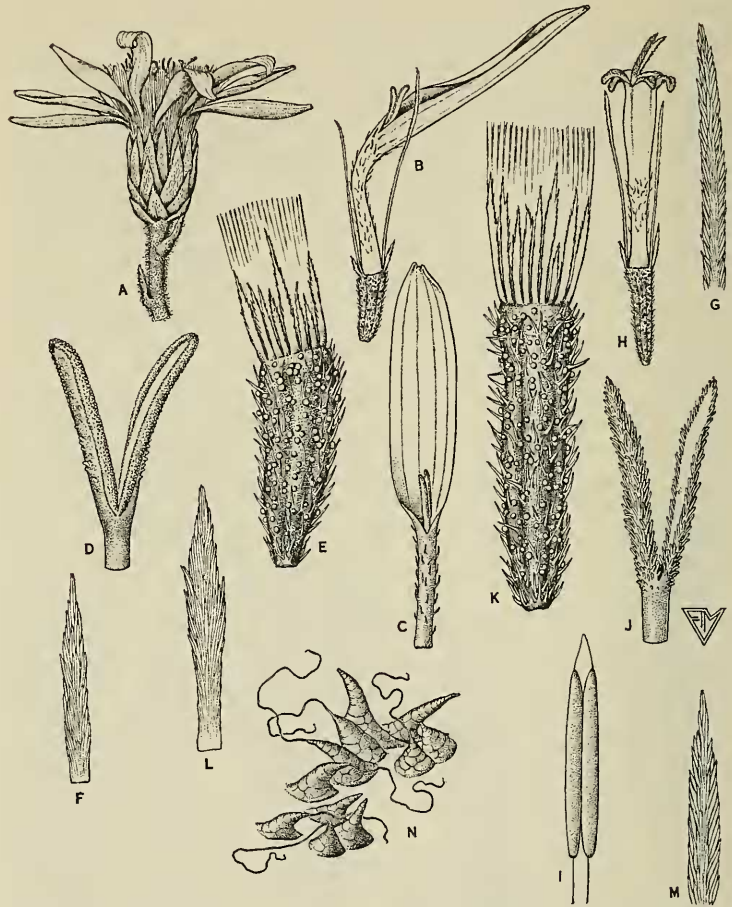


FIG. 3. *Diplostephium konotrichum*. A, head,  $\times 2$ ; B, ray flower,  $\times 5$ ; C, corolla,  $\times 5$ ; D, stylar branches of ray flower,  $\times 20$ ; E, ovary of ray flower,  $\times 15$ ; F, outer pappus bristle of ray flower,  $\times 30$ ; G, end of inner pappus bristle of ray flower,  $\times 30$ ; H, disc flower,  $\times 5$ ; I, anther,  $\times 15$ ; J, stylar branches of disc flower,  $\times 20$ ; K, ovary of disc flower,  $\times 15$ ; L, outer pappus bristle of disc flower,  $\times 30$ ; M, part of inner pappus bristle of disc flower,  $\times 30$ ; N, conic-tubercular, flagellate trichomes at the branches,  $\times 30$ . (Wurdack 1634).



forest on south side of Molinopampa-Diosan pass, 2700–3100 m alt.; shrub 4 m; rays lilac; disc yellow, 8 August 1962, J. J. Wurdack 1634. Holotypus, US (2373685).

Although *Diplostephium konotrichum* has the leaves and habit of *D. floribundum* HBK., it belongs to the section *Bifidum* and differs mainly in its thick, tuberculate-conical, acute, pluricellular trichomes which are flagellate at the apex, covering the branchlets with acute tubercles and an arachnoid-woolly tomentum. This kind of hair is almost unique in the genus, the only similar hairs being those found in *D. vermiculatum* Cuatr. and *D. hippophae* Blake. The conical hairs of *D. konotrichum* are very persistent and can be seen, at least their basal part, on old branchlets. This species certainly is very showy on account of its spreading lilac rays and abundant heads.

***Diplostephium wurdackii* Cuatr., sp. nov.**

Frutex vel arbuscula 1–2.5 m alta ramis terminalibus griseis cortice leviter fissurato arachnoideo-tomentuloso; ramis foliosis curvatis subteretibus (juvenilibus angulatis) dense adpresseque lanatis ochraceis vel ochraceo-cinereis.

Folia alterna rigide coriacea petiolata bicolora. Petiolus robustus 10–14 mm longus costa subtus crassa margine angusto involuto basi vaginato-dilatatus dense ochraceo-tomentoso-lanatus. Lamina elliptico-oblonga apice leviter attenuata obtusa vel obtusissima basi cuneata in petiolum angustata margine plus minusve revoluta repando dentata dentibus 1 mm longis acutis callosis patulis vel reflexis et cum indumento subtus velatis, 3–8 cm longa 1–2.7 cm lata; supra in sicco atroviridis juvenilis plus minusve lanuginosa deinde glabrata subnitida costa valde impressa nervis secundariis patulis 12–15 utroque latere impressis plus minusve conspicuis venulis minoribus plerumque obsolete, subtus dense crasseque ochraceo-lanata costa robusta eminentique reliquis nervis elevatis sed pleurumque cum indumento velatis.

Inflorescentiae corymboso-paniculatae floribundae terminales folia supra paulo excurrentes, 5–10 cm latae; axi robusto lanato-ochraceo ramis ascendentibus mediocribus rigidis dense ochraceo-lanatis, bracteis subtendentibus basi foliiformibus sed brevibus ceteris bracteis ovato-lanceolatis acutis amplexantibus ciliatis dorso lanatis 6–2 mm longis; ramusculi ultimi seu pedunculi monocephali plerumque 3–12 mm longi robustiusculi dense ochraceo-lanati tantum ad apicem basi involucri parvis bracteolis instructi. Capitula heterogama radiata 1.6 cm diametentia. Involucrum campanulatum 5–6 mm altum 3.5–4 mm diametente phyllariis imbricatis 5-seriatis interioribus lineari-oblongis obtusiusculis margine sursum erosis dorso villosis, 5 mm longis 1 mm latis, exterioribus ovato-ellipticis subobtusis vel obtusis circa 2 mm longis 1.3 mm latis dorso purpurascenti lanuginosi marginibus lacerato-ciliatis. Flores radii feminei ligulati 11–13 uniseriati; corolla pallide purpurea circa 10 mm longa tubulo 2–2.2 mm longo glabro vel sursum sparsis pilis lamina elliptico-oblonga apice minute tridentata glabra 2–2.3 mm lata; rami styli 1 mm longi lineari-

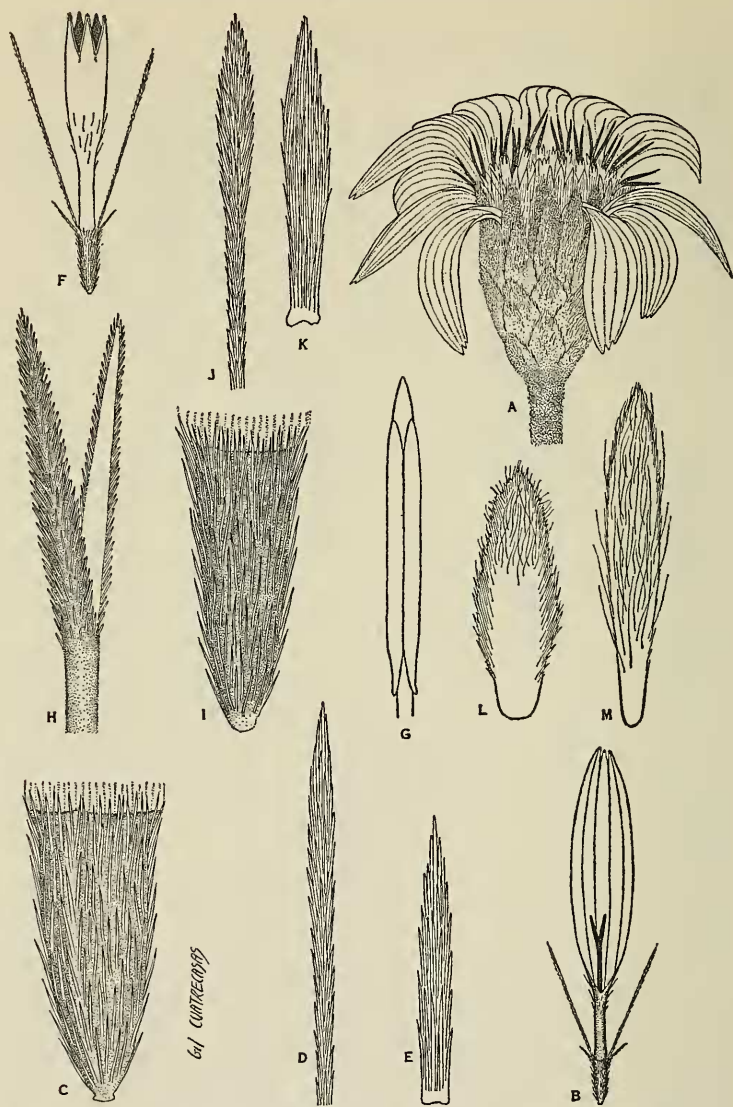


FIG. 4. *Diplostephium wurdackii*. A, head,  $\times 4$ ; B, ray flower,  $\times 4$ ; C, ovary of ray flower,  $\times 24$ ; D, end of the inner pappus bristle,  $\times 48$ ; E, outer bristle of ray flower,  $\times 80$ ; F, disc flower,  $\times 7.5$ ; G, anther,  $\times 20$ ; H, styler branches of disc flower,  $\times 32$ ; I, ovary of disc flower,  $\times 30$ ; J, end of inner pappus bristle of disc flower,  $\times 48$ ; K, outer pappus bristle of disc flower,  $\times 80$ ; L, medium-outer phyllary,  $\times 8.5$ ; M, inner phyllary,  $\times 8.5$ . (Wurdack 1672).

lanceolati brunnescenti-rubrescentibus margine incrassati minute papilloso-stigmatiferi; ovarium 1.5 mm longum parce triquetrum subcompressum; pappus rubescens 4–4.5 mm longus setis strigulosis extremo dilatatis biseriatis exterioribus brevibus 0.5–1 mm longis. Flores disci hermaphroditi 9–15; corolla lutea glabra tubulo 1.8 mm longo limbo tubuloso sursum gradatim ampliato deorsum sparse piloso dentibus 0.8 mm longis basi triangularibus apicem versus angustato-linearibus subacutis margine incrassatis apice papilloso; antherae 1.8 mm longae basi obtusae; rami styli purpurascens subulati robustiusculi circa 1.4 mm longi extus marginibusque dense longeque papilloso-hispidi; ovarium lineare leviter 3–5 nervatum villosulo-hispidum circa 1 mm longum fertile vel sterile; pappus 4–4.5 mm longum rubescens setis minute strigulosis sursum ampliatis inaequalibus biseriatis exterioribus 0.5–1 mm longis. Receptaculum subplanum circa 2 mm diametente marginibus alveolorum argute dentatis.

*Type:* Peru, Dept. Amazonas, Prov. Chachapoyas: Upper slopes and summit of Cerro Yama-uma above Taulia, 12–15 km SSE (145°) of Molinopampa, 3200–3450 m alt.; shrub 1–2.5 m, occasional; rays pale purple; disc yellow; 11 August 1962, J. J. Wurdack 1672. Holotypus, US (2373692).

*Diplostephium wurdackii* belongs to the Section *Bifidum* Cuatr. and Series *Denticulata* Blake. It is a striking species, differing from the most closely related species, *D. bicolor* Bl., and all others of the same series, in its spreading, large, broad, very showy, violaceous ray flowers. Furthermore, it differs from *D. bicolor* Bl. and *D. ochraceum* (HBK.) Nees in its thicker, smaller, more obtuse leaves, in the thicker, ochraceous, lanate tomentum, and in the densely villous ovaries. From *D. haenkei* (DC.) Wedd. and related species, it differs in its larger inflorescences, smaller heads, obtuse phyllaries, longer petioles, and larger, broader, obtuse leaves.

#### **Oritrophium aciculifolium** Cuatr., sp. nov.

Herba humilissima caespitoso-rosulata seu fasciculata scapifera rhizomate crassiusculo molli ramulis apice fasciculum cylindricum compactum vaginis foliorum imbricatorum ferentibus. Radices fibrosae. Folia omnia basalia rosulato-fasciculata 7–15 cm longa, lamina aciculata pallide viridi glabra coriacea rigida stricte lineari crassiuscule subtereti dorsiventraliter paulo compressa tantum nervo medio subtiliter impresso utrinque conspicuo (siccitate utrinque 3–4 striata) superficie visu laevi sed epidermi minutissime glanduloso-punctata, apice attenuato-acutata 3–12 cm longa 1–1.5 mm lata basi in amplam vaginam villosam amplectentem dilatata. Vagina hialino-carnosa circa 10-sulcato-striata (in sicco subscariosa) supra praecipue basim versus marginibusque densissime longissimeque fibroso-villosa, 2–3 cm longa basim versus sensim sine sensu ampliata ad basim circa 1 cm lata. Vaginae foliorum omnium spisse amplectentes basim foliorum fasciculos formantes.

Scapi 1-3 per fasciculum virides vel purpurascentes teneri subcapillares teretes sed levissime striolati fistulosi 0.6-1 mm diametentes 10-24 cm longi erecti recti vel leviter flexuosi deorsum glaberrimum sursum parcissimis pilis tenuibus flexuosis gradatim densiusculis extremo laxo villosulo-lanuginosi inferiore parte nudi cetera bracteati bracteis linearibus vel superne lineari-lanceolatis viridibus glabris vel supremis ciliatis quam internodiis brevioribus et sursum gradatim minoribus 12-4 mm longis basi ampliata ad 1.5 mm lata.

Capitula heterogama radiata 1.5 cm diametentia. Involucrum campanulatum basi subrotundatum laete viride 8-9 mm altum 7-8 mm diametente, phyllariis circa 5 seriatis interioribus linearibus acutis pallide-viridibus vel apice purpurascenti dorso glabro margine scariosis ciliatisque 7-8.5 mm longis 1-1.5 mm latis, mediis exterioribusque gradatim brevioribus subacutis dorso plus minusve brunnescentibus glabris margine bene ciliatis externis 4-5 mm longis 1 mm latis. Flores radii feminei ligulati 1-2-seriati 20-27; corolla alba 8-9.5 mm longa tubulo 3-3.5 mm longo villosulo lamina lineari-oblonga obscure 3-nervata minute tridentata glabra 1-1.2 mm lata; rami styli subulati 1 mm longi marginibus incrassatis minute papilloso-stigmatici; ovarium obovato-oblongum basim angustatum dense hispidum; achenia circa 3 mm longa levissime compressa obscure 5-nervata dense albeque hispida; pappus 4 mm longus stramineus setis subuniseriatis inaequilongis rigidulis acutis minute strigulosus. Flores disci hermaphroditi 23-37; corolla lutea 4-4.5 mm longa tubulo circa 2 mm longo crassiusculis pilis munito limbo tubuloso sursum gradatim ampliata basi paulo pilosulo cetero glabro dentibus 5 oblongis subacutis 1 mm longis margine incrassatis subapicem extus breviter papilloso-pilosis apice minute papillosulo; antherae 1.4 mm longae acutiuscule auriculatae; rami styli subulati 1.2 mm longi extus margineque papilloso-hispiduli; ovarium lineatum 3-3.5 mm longum obscure 5-nervatum densiuscule hispidum sterile; pappus 4-4.5 mm longus subuniseriatis setis rigidulis minute scabrosus acutis inaequilongis parvis minimis 0.3-1 mm longis quam longioribus intermixtis. Receptaculum 2-2.5 mm diametente minute alveolatis marginibus alveolorum longe dentatis.

*Type:* Peru, Dept. Amazonas, Prov. Chachapoyas: Middle eastern Calla-Calla slopes, near Kms. 416-419 of Leimebamba-Balsas road, 2900-3100 m alt., locally frequent; rays white, disc yellow; 9 July 1962, J. J. Wurdack 1275. Holotypus US (2373650).

*Oritrophium aciculifolium* differs from all known species of the genus in its acicular leaves similar in aspect to a long leaf of pine; they are subcylindrical, slightly compressed, smooth but with an impressed fine midrib. In the nature of its scapes and heads it approaches *O. repens* (HBK.) Cuatr., which differs in having coriaceous, oblong-elliptic leaves.

***Baccharis chachapoyasensis* Cuatr., sp. nov.**

Frutex usque ad 2 m alta ramis ascendenti-divaricatis resinosis glabris viridibus angulatis cicatricibus foliorum elapsorum tuberculato-eminenti-



bus ramulis foliosis crassiusculis viridibus internodiis cum foliis satis copiosis valde brevioribus. Partes juveniles valde viscoso-resinosae.

Folia alterna glabra integerrima breviter petiolata crassa in sicco flavescenti-viridia. Lamina oblongo-obovata apice obtusissima vel rotundata basim versus gradatim in brevem petiolum attenuata superficie utrinque minute copioseque glanduloso-granulata glandulis resinosis subimmersis, costa supra paulo subtus magis eminenti nervis lateralibus 5-6 utroque latere valde angulato-ascendentibus prope marginem arcuato-anastomosatis subtus saepe prominulis supra plerumque obsolete 2-5 cm longa 9-25 mm lata. Petiolus 2-5 mm longus basi valde ampliata incrassato-vaginata tuberculato-persistenti.

Capitula solitaria axillaria sessilia; mascula campanulata 8-9 mm alta 6-7 mm diametentia, basi bibracteata bracteis oppositis limbo patulo brevi crasso viridi ovato subobtusum 2 mm longo 2.5 mm crasso in vaginam crasso-scariosam amplectentem 3-4 mm longam 3 mm latam ampliatis. Involucrum circa 6-7 mm altum 24-30 phyllariis 4-5 seriatis pallide brunneo-viridibus 24-32 exterioribus crassiusculis subscariosis ovato-oblongis apice attenuatis obtusis resinosis 4-5.5 mm longis 3-2 mm latis, intimis scariosis linearibus 5-6 mm longis 0.8-0.6 mm latis ad apicem subacutum eroso-ciliatis ceteris glabris. Flores masculi 32-41 in capitulo; corolla 5.4-6 mm longa tubulo 3.8-4 mm longo sursum minute glanduloso-pilosulo limbo in 5 lobos 1.6-2 mm longos 0.5-0.6 mm latos lineares acutos apice papillosos inciso. Antherae 1.6 mm longae basi obtusae. Stylus crassus apice subpistillato breviterque acutato emarginatoque minute papilloso-piloso. Ovarium brevem glanduloso-granulatum sterile. Pappus albidus circa 20 setis 5.5-6 mm longis sursum dilatatis pennato-ciliatisque saepe setis brevioribus simplicibus circa 1 mm longis munitus. Receptaculum 2.2-2.4 mm diametens convexum alveolatum marginibus alveolorum tenuiter acutaeque dentatis.

Capitula feminea cum mascula similiter disposita bibracteata involucro circa 6 mm alta phyllariis circa 33 exterioribus  $5 \times 2-3$  mm, interioribus 5.2 mm longis 0.6-1 mm latis. Flores feminei 50-54; corolla capillari circa 3.5 mm longa apice angustissimo 5 lobulis linearibus acutis circa 0.4 mm longis coniventibus basim versus gradatim dilatata pilis minutis sparsis munita. Stylus 1.5-2 mm corollam excedens, ramulis 0.7-0.8 mm longis linearibus subacutis marginibus incrassatis dense stigmato-papillosis. Ovarium 1.7 mm longum glabrum 10-costatum ellipsoideo-oblongum leviter compressum. Pappus albus 4 mm longus setis inaequilongis biserialis sericeis minute strigillosis apice haud ampliatis acutis.

*Type:* Peru, Dept. Amazonas, Prov. Chachapoyas: Rocky slopes of Caño Santa Lucía just E of Chachapoyas, 2000-2400 m alt.; shrub 0.7-2 m, male, flowers white; frequent; 28 May 1962, J. J. Wurdack 597. Holotypus, US (2373562). Same date, female specimen, Wurdack 598, paratypus US (2373563).

*Baccharis tricuneata* (L. f.) Pers.,  
fma. *callaensis* Cuatr. fma. nov.

Frutex erectus usque ad 1.5 m altus ramulis valde foliosis viscoso-glandulosisque. Folia viridia glanduloso-punctata chartacea plana breviter petiolata; lamina obovato-oblongo-cuneata obtuse vel subacute tridentata interdum integra 7–13 mm longa 3.5–7 mm lata. Capitula mascula solitaria subsessilia axillaria pauca saepe unum duave ad extremos ramulorum, circa 8 mm longa 4 mm lata. Flores masculi circa 16 corolla circa 6 mm longa tubulo circa 4 mm sursum paulo pilosulo limbo laciniis lanceolato-linearibus 1.5 mm longis. Ovarium brevissimum glabrum. Pappus albidus 4–4.5 mm longus setis apicem dilatatis. Involucrum circa 28 phyllariis scariosis, externis ovatis acutiusculis circa 2.5 mm longis 1.5 mm latis internis lineari-lanceolatis acutis margine ad apicem eroso ciliatis circa 5.5 mm longis 0.7–1.1 mm latis.

*Type:* Peru, Dept. Amazonas, Prov. Chachapoyas: Uppermost slopes and summit of Cerros de Calla-Calla, near Kms. 403–407 of Balsas Leimebamba road, elev. 3400–3550 m; shrub 1.5 m, male, flowers white; occasional; 18 August 1962, J. J. Wurdack 1706. Holotypus US (2373700).

The plant of Calla-Calla is a very leafy and typical páramo form of this widely distributed high Andean species. It is distinguished by its obovate-oblong, broadly cuneate leaves and by its solitary heads sparsely borne near the end of the branchlets. This form is closely related to *B. tolimensis* Hieron. from the Central Andes of Colombia and to *B. variifolia* Hieron. from Ecuador, both also merely forms of *B. tricuneata*.

*Psilactis brevilingulata* Sch. Bip. ex Hemsl.,  
fma. *andina* Cuatr. fma. nov.

Herba annua parce ramosa circa 30 cm alta caule ramisque tenuibus erectis viridi-purpureis pubescentibus pilis albis tenuibus subadpressis et glandulis globosis stipitatis copiosis munitis. Radix simplex verticalis 3.5 cm longa.

Folia lineari vel lineari-lanceolata sessilia basi amplectentia apicem versus gradatim attenuata acuta calloso-mucronulata margine integra utrinque praecipue subtus sparse stipitato-glandulosa triplinervia 3–10 mm longa 0.5–2 mm lata nervis supra impressis subtus prominulis.

Capitula heterogama radiata perparva hemisphaerica 3–4 mm longa et lata solitaria ad ramusculos ultimos erectos plus minusve paniculatos terminalia. Ramusculi seu pedunculi 1–3 cm longi capillares stipitato-glandulosi sparse pilosuli bracteati bracteis cum foliis linearibus acutatis calloso-mucronulatis glandulosi 4–3 mm longis circa 0.5–1 mm latis. Involucrum rotundato-campanulatum 3.5–4 mm altum phyllariis biseriatis lineari-lanceolatis dorso margineque sursum viridulis glandulosi basim margine scariosis, intimis acute acuminatis acumine rubescenti margine eroso-ciliato 4 mm longis 0.3–0.4 mm latis, exterioribus margine glanduloso 3–2.5 mm longis 0.5–0.8 mm latis. Flores radii feminei ligulatae

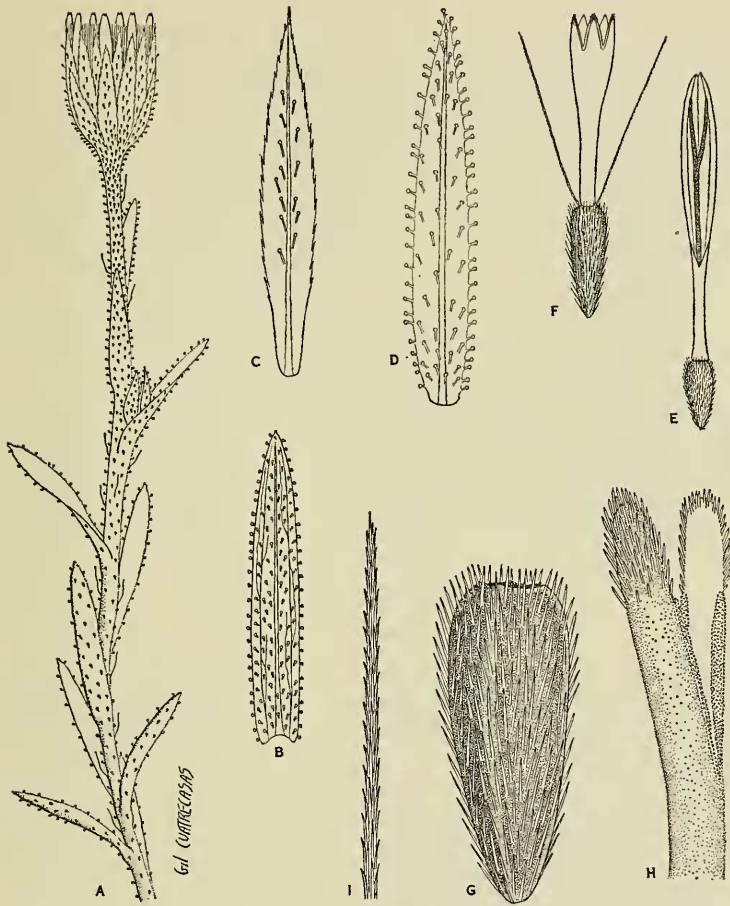


FIG. 5. *Psilactis brevingulata* fma. *andina*. A, flowering branchlet,  $\times 5$ ; B, outer phyllary,  $\times 17$ ; C, inner phyllary,  $\times 12$ ; E, ray flower,  $\times 12$ ; F, disc flower,  $\times 12$ ; G, achene,  $\times 30$ ; H, stylar branches of disc flower,  $\times 90$ ; I, end of pappus bristle,  $\times 90$ . (Ellenberg 1919).

involucrum paulo excedentes biseriati 18–20; corolla alba glabra 3–3.2 mm longa tubo capillari 1–1.2 mm longi lamina lineari inaequaliter bidentata 3-nervata 2–2.2 mm longa 0.5–0.6 mm lata; ovarium obovato-oblongum triquetrum dense strigoso-sericeum; stylus 1 mm tubum excedens ramis 6 mm longis anguste linearibus margine incrassato papilloso-stigmatico; pappus nullus; achaenia oblongo-obovata inaequilatera obsolete 5-nervata apice rotundata basi acutata dense sericea. Flores

disci hermaphroditi circa 12, corolla flava glabra 2-2.2 mm longa tubulo 0.9 mm longo limbo infundibuliformi-tubuloso dentibus triangularibus acutis marginibus incrassatis minute papillosisque; antherae 0.6 mm longae basi obtusae apice appendiculatae; rami styli 0.4-0.5 mm longi complanati lineares margine papilloso-stigmatico apice elongato-triangulari papilloso-piloso; ovarium obovato-oblongum leviter compressum dense sericeum; achaenia obovato-oblonga basi acuta levissime compressa obsolete 5-nervata dense sericea 1.5 mm longa; pappus stramineus 2 mm longus setis rigidulis acutis minute strigosis uniseriatis basi breviter coalitis. Receptaculum 1.2 mm latum alveolatum marginibus alveolorum elevato-dentatis.

*Type*: Peru, Cajamarca: 10-15° SW of Chidén, below Sunchubamba, 2800 m alt.; shady prairie; rainy season, 10 June 1957, H. Ellenberg 1919. Holotypus, U.

The genus *Psilactis* has been mentioned in the literature only as from North America (California, Texas, Mexico). This Ellenberg specimen differs from the descriptions of all known forms and is the first record for the genus from Peru. Several years ago I studied specimens of *Psilactis* from Colombia, which I attributed temporarily to *Psilactis brevilingulata* Sch. Bip. ex Hemsl., but that material was not at hand when I studied the Ellenberg collection. I plan to report on it later.

**Ellenbergia** Cuatr., gen. nov. Compositarum  
(Eupatorieae-Piquerinae)

Capitula homogama discoidea parva. Involucrum campanulatum phyllariis paucis (8) aequalibus biseriatis membranaceis. Receptaculum planum foveolatum nudum. Flores omnes hermaphroditi. Corollae campanulatae subite in angustum tubum brevem constrictae 5-dentatae dentibus deltoideis. Antherae oblongae basi integrae apice exappendiculato truncato-emarginato. Filamenta brevissima. Styli rami arcuati longe crasseque clavati obtusissimi papilloso-pilosi marginibus deorsum dimidia inferiori parte stigmatiferis. Achaenia nigra prismatica argutissime 5-angulato-costata faciebus scrobiculatis nitidis. Pappus squamis angustis lanceolatis margine strigoso-ciliatis basi in cupulam connatis.

*Species typica*: *Ellenbergia glandulata* Cuatr.

*Ellenbergia* belongs to the subtribe *Piquerinae* Hoffm., being closely related to the genus *Phania*. From this and the other related genera it differs chiefly in the structure of the pappus; its scales, usually about 20, are rigid, lanceolate-subulate, and united at the base into a cupular piece easily separable from the achene.

**Ellenbergia glandulata** Cuatr., sp. nov.

Herba annua tener 20-35 cm alta caule simplice 1.5-2 mm diametente erecto pauce laxaque ramoso ramulis tenuibus patulis ad 8 cm longis oppositis supremis alternis caule ramisque pubescenti-hirtulis copiosis



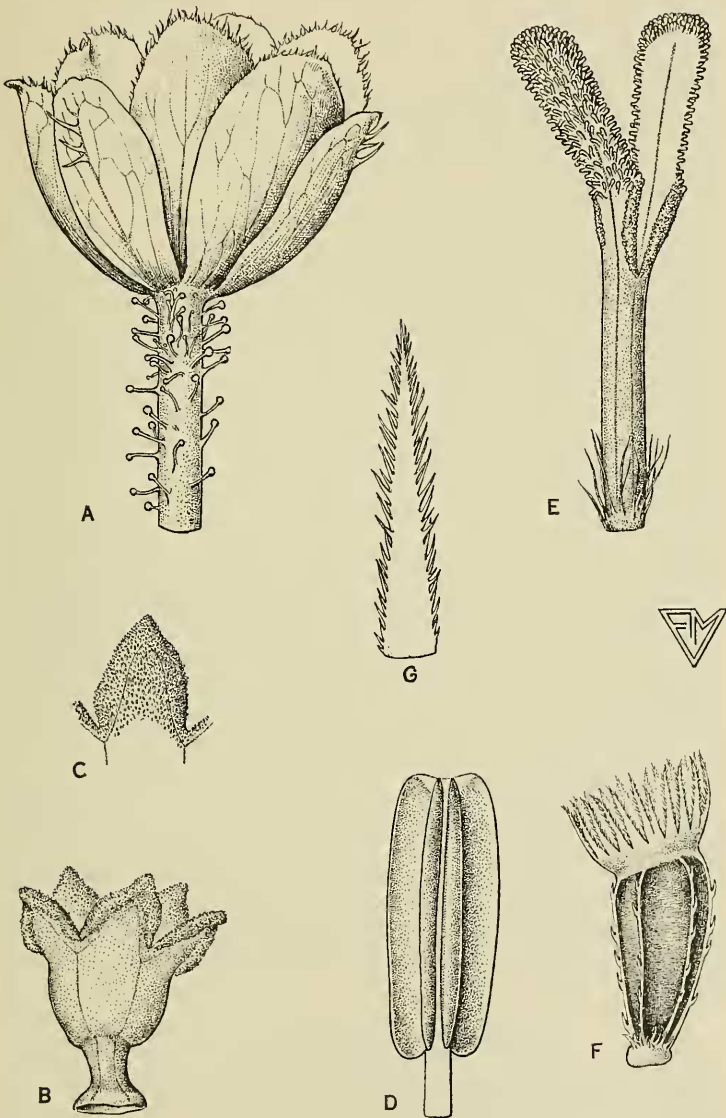


FIG. 6. *Ellenbergia glandulata*. A, involucre and pedicel,  $\times 12$ ; B, corolla,  $\times 15$ ; C, lobe of corolla,  $\times 15$ ; D, anther,  $\times 60$ ; E, style,  $\times 35$ ; F, achene,  $\times 20$ ; G, scale of pappus,  $\times 60$ . (Ellenberg 982).

pilis patulis circa 1 mm longis (usque ad 2 mm) pluricellularibus rectis vel parce flexuosis acutis apice globoso-glanduliferis instructis.

Folia opposita membranacea viridia, petiolo tenui 2–12-mm longi hirtuli, lamina ovata vel ovato-elliptica grosse crenato-dentata obtusiuscula vel subacuta basi obtuse cuneata vel subtruncata 1–2.5 cm longa 0.6–2 cm lata, utrinque sparse pilosa pilis glanduliferis vel eglandulosis costa conspicua nervis lateralibus 2–3 utroque latere conspicuis patulo-ascendentibus sursum curvato anastomosatis venulis reticulum laxum plus minusve conspicuum formantibus.

Inflorescentiae paniculis laxis paucifloris (6–8 capitulis perparvis) ramulis ultimis tenuibus flexuosis instructae.

Pedicelli capillares 5–10 mm longi copiose piloso-glandulosi (glandulis globosis stipitatis). Capitula discoidea minuta 2.5–3 mm longa et ampla in panicula terminali alternifoliata laxa pauciflora instructa.

Involucrum pallide viride phyllariis 8 subaequalibus biseriatis lateraliter imbricatis membranaceis oblongo-ellipticis vel obovato-ellipticis obtusis 2.5–3 mm longis 1.2–1.6 mm latis nervo medio bene conspicuo 2–3 nervis lateralibus tenuibus superne arcuato-anastomosatis glabris sed margine apice obtuso eroso-ciliatis.

Flores omnes hermaphroditi 11–12; corolla 1.7–2 mm longa crassiuscula alba (?) tubulo valde constricto 0.5–0.6 mm longo basi dilatato sparsis glandulis munito limbo late campanulato 1–1.3 mm longo 0.7–0.8 mm diametente parce glanduloso dentibus triangularibus acutis deinde recurvatis marginibus crassiusculis minute papillois; antherae oblongae apice obtusae emarginato-subtruncatae calloso-incrassatae exappendiculatae basi obtusae 0.6 mm longae; filamenta brevissima; stylus crassiusculus 1.2 mm longus in 2 ramos 1 mm longos recurvatos crassos late oblongo-clavatos dense crasseque papilloso-pilosos marginibus dimidia parte inferiora opacis stigmatiferis productus; achaenia nigra 1.2–1.3 mm longa 0.6 mm lata prismatica basi attenuata argute 5-angulato-costata, costis eminentibus setis ochraceis uniseriatis adpressis instructis faciebus glaberrima nitidissima scrobiculata; pappus 20 squamis circa 0.7 mm longis rigidis lanceolato-subulatis strigoso ciliatis basi in cupulam 0.5–0.6 mm amplam coalitis; receptaculum planum sparse foveolatum nudum.

*Type:* Peru, Dept. Cuzco, Prov. Urubamba: Mandor below Machupicchu, 80° NW. "Nebelwälder der Ostanden, Regenzeit; feuchte Bromeliaceen-Felswand," 13 April 1957, H. Ellenberg 982. Holotypus, U.

***Helianthus lodicatus* Cuatr., sp. nov.**

Frutex ramosus ramis foliosis densissime crasseque albo-lanatis.

Folia alterna coriacea lanceolato-ovata basi rotundata vel obtuse cuneata apice subacuta margine integra vel leviter sinuata revoluta 15–26 mm longa 7–15 mm lata; supra viridi-cinerea dense strigosa pilis rigidulis acutis albidis basi calloso-tuberculatis subadpressis nervis tribus vel tantum costa filiformi albida impressa notatis venulis reticulatis

et superficie rugosa fere obsoletis; subtus flavescenti-alba crassissime denseque lanata, costa nervis lateralibus paucis leviter conspicuis. Petiolus 3–5 mm longus basi ampliatio-vaginatus dense lanatus.

Capitula heterogama radiata solitaria terminalia pedunculata radii expansis 4–5 cm lata disco 1.5 cm diametenti. Pedunculi 1.5–4 cm longi crasse denseque ochroleuco-lanati 2–3 mm diametentes. Involucrum campanulatum circa 15 mm altum 2 cm diametente lanuginosum. Phyllaria 5-seriata lineari-oblonga herbacea basi incrassata apice acutata intima 15–16 mm longa 3–4 mm lata sursum extus lanuginosa, intermedia 11–13 mm longa inferne magis callosa superne herbacea lanata apice reflexo, externa similia gradatim breviora 8–9 mm longa 3–4 mm lata margine revoluta extus dense lanata. Flores radii ligulati steriles; corolla lutea lamina lineari-oblonga 23–26 mm longa circa 5 mm lata 12-venosa apice bidentata extus pubescenti-sericea basi tubulo 1 mm longo; ovarium lineare triquetrum 2–3 mm longum glabrum sterile, pappo 1 aristam subulatum margine eroso-strigosam deciduam reducto. Flores disci hermaphroditi crebri; corolla lutea circa 7 mm longa 1 mm diametenti deorsum minute strigulosa basi in tubum circa 1 mm longum angustata apice dentibus quinque oblongo-deltaideis acutis margine incrassatis papillosisque circa 1 mm longis; antherae 3.2 mm longae oblongae nigrae basi obtusae apice ovato-appendiculatae; rami styli 1.4 mm longi oblongi prope apicem paulo incrassati subite acutati extremo papilloso-pilosi; achaenia nigra plus minusve sordide maculata nitida obovato-oblonga paulo compressa faciebus laevibus circa 3 mm longa 1.4 mm lata; pappus aristis duobus lanceolatis acutissimis margine eroso-ciliatis valde deciduis 2–2.3 mm longis instructus. Receptaculum convexum paleaceum foveolatum. Paleae rigide scariosae stramineae brunnescenti-nervatae ovato-lanceolatae acutaeque parcissime ciliatae naviculares flosculos involventes circa 8 mm longae 3–3.5 mm latae.

*Type:* Peru, Dept. Cajamarca: Sunchubamba on the way to Huallabamba, upper Chicama valley, 3000–3700 m alt., "Waldstufen und Paramos der westlichen Anden Nordperu. Buschige Viehweiden," 3 June 1957, H. Ellenberg 1756. Holotypus, U.

The interesting high Andean *Helianthus lodicatus* belongs to the relationship of *H. lanatus* Heiser but differs essentially from it in the very thick, compact, lemon-colored indument which covers branches and the under surface of the leaves. It also differs in the thicker, smaller, alternate, and crowded leaves, in the longer rays, and in its almost glabrous pales.

The looser texture of the indument, the opposite, broader, cordate, larger leaves which have another type of strigae above readily distinguish *H. jelskii* Hier. from the new species. *H. microphyllus* HBK. has narrower, linear or oblong leaves and smaller heads and flowers. *Helianthus Stuebelii* Hier. has larger ovate-lanceolate leaves, with looser tomentum beneath, and less crowded and much larger strigose-tuberculate hairs on the upper surface of the leaves. I have examined a fragmentary

specimen of Weberbauer (number 4241, US), which could be considered the neotype of *H. Stuebelii* if the type (*Stuebel 34e*), formerly in Berlin, really is destroyed.

***Viguiera ellenbergii* Cuatr., sp. nov.**

Suffrutex caule erecto ramis subteretibus striolatis purpureis asperulis hispidulis pilis pluricellularibus rigidulis acutissimis basi dilatato-tuberculata plus minusve persistenti.

Folia alterna rigidule coriacea discolora subsessilia. Petiolus 1–2.5 mm longus planus cum ramo adpressus subvaginatus extus purpurascens hipidulusque. Lamina ovato-lanceolata basi rotundata seu subcordata apice acuta margine dentibus minimis et obsolete revoluta 4–10 cm longa 1.5–4.5 cm lata; supra viridi-purpurascens nitidula valde bullata rugosa aspera copiosis pilis acutis rigidis basi calloso-tuberculatis munita triplinervia costa duobusque nervis lateralibus ascendentibus valde impresso-conspicuis superne 1–2 nervis secundariis brevioribus utroque latere ascendentibus notatis, reticulum venulorum obcurum impressum; subtus viridi-cinerea dense lanata costa duobusque nervis lateralibus principalibus et parvis nervis secundariis eminentibus densiuscule tuberculato-hispidis, venulis minoribus reticulum elevatum rubellum cum tomento tectum formantibus.

Capitula heterogama radiata longe pedunculata solitaria terminalia expansa 5–6 cm diametentia sed disco 2 cm diametro. Pedunculi robusti erecti striolato densiuscule hispidulo nudo 3–12 cm longo. Involucrum hemisphaericum 4-seriatum. Phyllaria valde imbricata squarrosa crasse herbacea purpurascencia inferne angustiora calloso-incrassata pallidaque limbo oblongo-obovato subobtusum utrinque dense strigoso recurvato, intima 9–10 mm longa 4–5 mm lata intermedia et exteriora 8–7.5 mm longa, 3–4 mm lata. Receptaculum 1 cm diametente convexum paleaceum. Paleae scariosae rigidulae venosae plus minusve rubescentes elliptico-oblongae naviculares apice obtuso minute mucronulato, 7–8 mm longae ad 4 mm latae, flosculos involventes. Flores radii ligulati steriles circa 15; corolla lutea lineari-oblonga obtusiuscula bidentata 12–15-rubronervata 18–22 mm longa 4–5 mm lata extus sparsissime hirtula intus dense minuteque velutino-papillosa basi tubo 0.5–1 mm longo; stylus absens; ovarium oblongum basim versus gradatim angustatum 3 nervatum compressum glaberrimum sterile circa 4 mm longum 1.4 mm latum; pappus squamis scariosis laceratis circa 0.3 mm longis plus minusve in coronam adherentibus. Flores disci hermaphroditi numerosi (circa 200) cum paleis involuti; corolla lutea circa 5–6 mm longa basi tubulo (0.7–1 mm longo) brevi subite contracta limbo tubuloso campanulato sparse basim versus dense striguloso dentibus deltoideis acutis circa 0.9 mm longis margine incrassatis intus minute papillosis nervis commissuralibus dentibusque rubescentibus; antherae 3 mm longae oblongae basi breviter auriculatae apice scarioso-appendiculatae; rami styli 1.6–1.8 mm longi recurvati crassiusculi obtusiusculi extus sursum papilloso-pilosi. Achaenia



immatura nigra obovoideo-oblonga basim versus paulo angustata 4 mm longa 1.5 mm lata leviter compressa obtuseque angulata faciebus crassiusculis levissime elevato-angulatis basi breviter callosa sparse setulosa; pappus 2-aristatus squamulosusque; aristis utroque latere 2-4 mm longis acutis ciliato-strigosis, squamis intermediis 0.5-1 mm longis ovalis inaequalibus lacerato-ciliatis basi brevissime coalitis.

*Type:* Peru, Dept. Cuzco, Prov. Urubamba: Eastern slope of Machupicchu, Andean forest 2400 m alt., rainy season, 6 April 1956, H. Ellenberg 719. Holotypus, U.

*Viguiera ellenbergii* is a well-defined Peruvian species belonging to the Series *Aureae* Blake. From the other species of this group, it can be distinguished by its sessile, ovate-lanceolate, rigid, subcoriaceous leaves which are strongly rugose, rough and dark above and lanuginose-tomentose, greenish-cinereous beneath. Furthermore, this species differs in its hemispheric and firm 4-seriate involucre, in its obovate, subobtuse, hard, and squarrose phyllaries, in its long rays, and in the size of all these parts.

***Viguiera lepidostephana* Cuatr., sp. nov.**

Herba annua circa 40 cm alta caule tenui erecto striato hirtulo, pilis tenuibus patulis acutis basi dilatatis circa 0.5 (-1) mm longis, sparse folioso parce dichotomo-ramoso ramis patulis 1-3 ramulos graciles monocephalos ferentibus.

Folia alterna membranacea petiolo tenui 3-8 mm longo hirtulo. Lamina ovata vel ovato-lanceolata basi rotundata apice angustata acutaque margine serrata 4-8 cm longa 1.8-3 cm lata utrinque viridis strigulosa copiosis pilis tenuibus sed rigidis acutissimis basi tuberculati subadpressis instructa, nervis tribus (costa unoque nervo secundario utroque latere) valde conspicuis supra filiformibus subtus prominentibus nervulis transversis et venulis minoribus laxe reticulatis supra plus minusve conspicuis subtus prominulis.

Pedunculi erecti capillares striolulati densiuscule hirtuli ebracteati. Capitula radiata primum campanulata 5-6 mm diametentia 6 mm alta deinde semiglobosa ad 9 mm lata. Involucrum phyllariis 2-seriatis lineari-lanceolatis acutis viridibus 3-5 nervatis basi paulo induratis pallidioribusque dorso marginibusque pubescenti-hirtulis, 2.5-3 mm longis 0.5-0.8 mm latis. Receptaculum hemisphaericum foveolatum paleatum 2 mm diametente. Paleae obovatae breviter acuminatae scariosae brunneo-costatae plus minusve venoso-striolatae margine translucidae flosculos involventes juveniles circa 4 mm longae 2 mm latae vetustae rigidiores usque ad 5 mm longae 3 mm latae, praecipue ad costam marginibusque minute ciliatae. Flores radii ligulati steriles circa 6; corolla flava lamina obovata vel elliptica basi cuneata tenuiter 4-nervata margine integra tantum extus apiceque parcissimis pilis 5 mm longa 4 mm lata tubulo obsoleto, ovario lineari striolato piloso sterile, pappo nullo. Flores disci hermaphroditi 25-30; corolla lutea (?) 3-3.2 mm

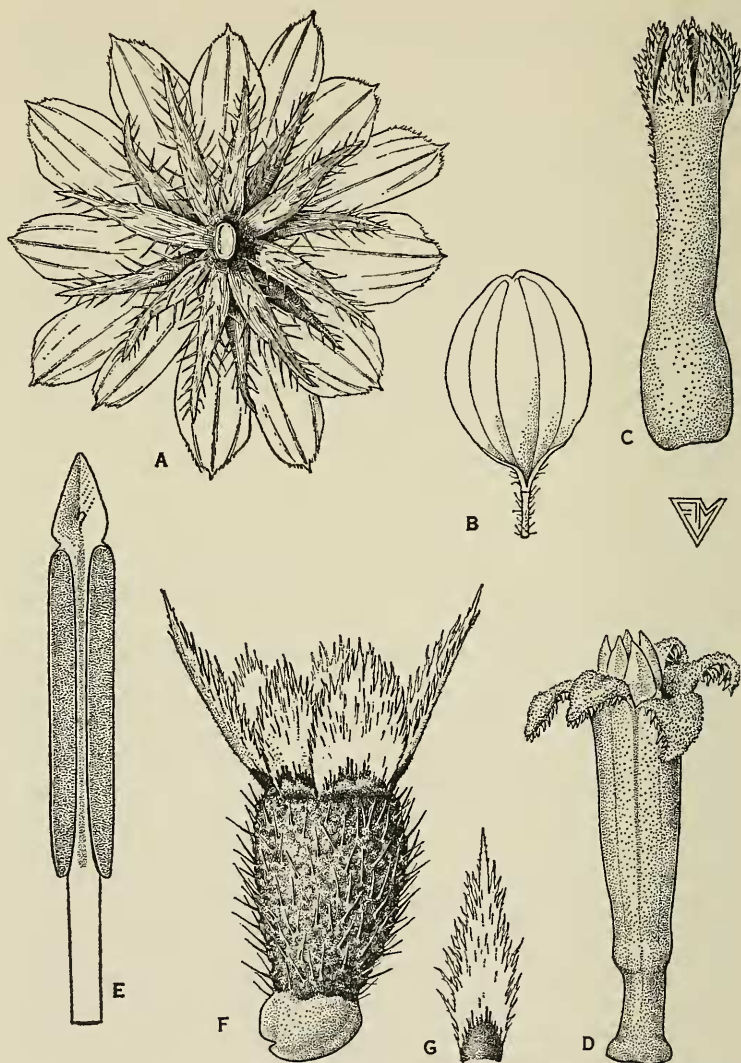


FIG. 7. *Viguiera lepidostephana*. A, involucre,  $\times 7$ ; B, ray corolla,  $\times 5$ ; C, unopened disc corolla; D, ripe disc corolla,  $\times 20$ ; E, anther,  $\times 30$ ; F, achene,  $\times 15$ ; G, scale of pappus,  $\times 15$ . (Ellenberg 1423).

longa subglabra (sparsis pilis papillosis acutis) tubulo stricto 0.6 mm longo limbo tubuloso sursum leviter sine sensu ampliato dentibus deltoideo-oblongis marginibus incrassatis papillosulis circa 0.8 mm longis; antherae circa 2 mm longae saccis linearibus aatribus 1.5 mm longis basi acutiusculis apice appendice scarioso ovato 0.5 mm longo. Stylus ramis 1 mm longis crassiusculis marginibus incrassatis stigmatiferis apice subite acutato papilloso-piloso; ovarium oblongum lateraliter 3 costato-angulatum dilute adpresseque sericeo-villosum; pappus 6 squamis scariosis translucidis duobus oppositis 5 mm longis late lanceolatis acutis, quatuor ovatis vel ellipticis obtusis 1 mm longis, omnibus profunde lacerato-ciliatis; achaenia nigra levissime compressa biangulataque minute tuberculata copiose setifera circa 2 mm longa 1 mm lata basi carpopodium crasso-callosum pallidum circa 0.3 mm longum producta; pappus squamis rigidis chartaceis basi incrassatis et nigro-maculatis sursum sparse atrolineatis, duabus lateralibus late lanceolatis acutis lacerato-ciliatis circa 2 mm longis quatuor intermediis ovatis seu ellipticis obtusiusculis margine laceratis 1.2–1.3 mm longis 0.7–0.9 mm latis.

*Type:* Peru, Dept. Tumbes: 7° WSW Cienago, S of Zorritos, 430 m alt., subdesertic coastal zone, 17 May 1957. H. Ellenberg 1423. Holotypus, U.

*Viguiera lepidostephana* belongs to section *Paradosa* series *Aureae* subseries *Pusillae* Blake. It is similar in habit and most closely related to *V. pusilla* (Gray) Blake, from which it differs in its smaller heads, flowers, and fruits, in the shape of the ligules, and chiefly in the structure of the pappus. In *V. lepidostephana* the two lateral bristles actually are scales of the same texture and character but only narrower and longer than the other four scales. This kind of pappus is not typical for the genus, bringing the new species to a marginal position in *Viguiera*.

#### ***Senecio aclydiphyllus* Cuatr., sp. nov.**

Frutex ad 1 m altus caule robusto basi saepe plus minusve prostrato radicanti extremo erectissimo plerumque simplice vel 2–4 ramis instructo, tantum sursum foliato dense crasseque albo-lanato, deorsum exfoliato cicatricoso vaginis foliorum delapsorum persistentibus crebris et indumento arachnoideo-lanuginoso vestito.

Folia alterna crasse coriacea breviter petiolata confertissima. Petiolus 5–10 mm longus dimida parte inferiori in vaginam amplectentem ad 4–5 mm latam dilatatus dense adpresseque albo-lanatus. Lamina lanceolata basi rotundata vel subcordata apice acuta vel subacuta mucronulataque margine revoluta integra vel levissime sinuata, 2.5–6 cm longa 0.8–1.6 cm lata, supra viridis valde juvenilis arachnoidea mox glabrata costa impressa plus minusve albo-lanata excepta, nervis secundariis congestis bene conspicuis patentibus impressis circa 1 mm inter se distantibus nervulis minoribus parallelis et transversis etiam plus minusve conspicuis; subtus omnia albo lanata costa crassa tantum conspicua cetera cum indumento crassissimo intricato adpresso tecta.

Inflorescentia terminalis paniculata 5–10 cm ampla folia suprema

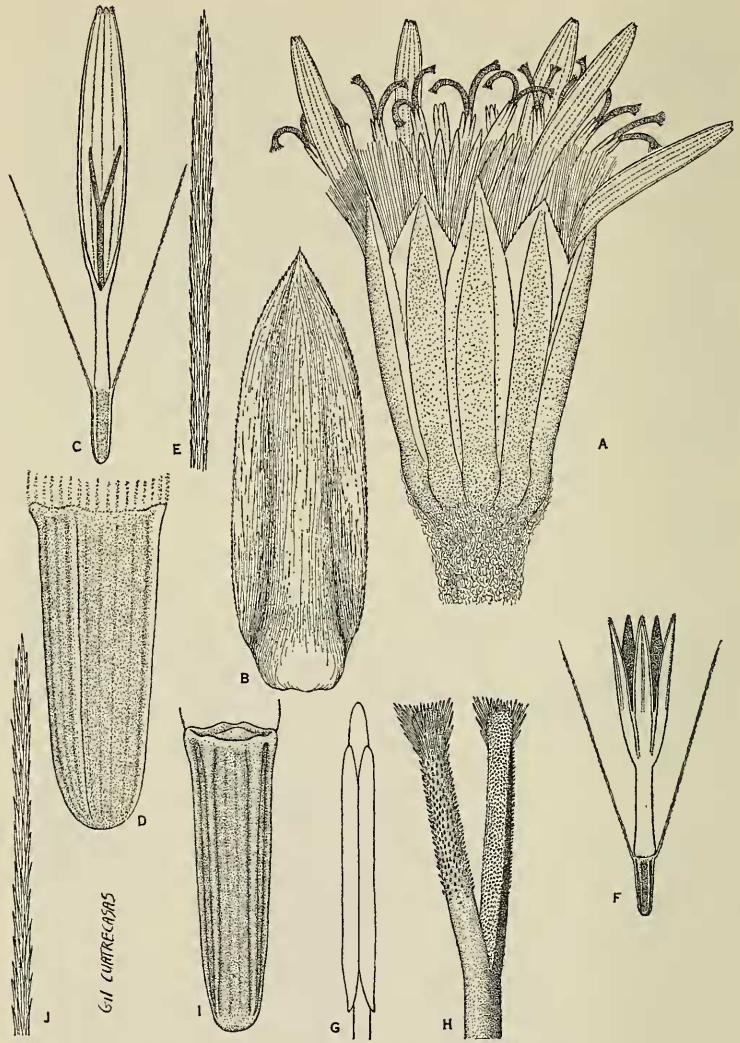


FIG. 8. *Senecio aclydiphyllus*. A, head,  $\times 5$ ; B, inner phyllary,  $\times 7.5$ ; C, ray flower,  $\times 5$ ; D, ovary of ray flower,  $\times 25$ ; E, end of pappus bristle,  $\times 60$ ; F, disc flower,  $\times 4$ ; G, anther,  $\times 17$ ; H, styler branches of disc flower,  $\times 20$ ; I, ovary of disc flower,  $\times 23$ ; J, end of pappus bristle,  $\times 60$ . (Wurdack 1196).



excedens basi foliata axi ramisque erectis angulatis dense albo-lanatis bracteis subtendentibus membranaceis flexuosis lanceolatis vel lanceolato-linearibus acutis integris 15–12 mm longis 8–2 mm latis subtus albolantibus. Pedicelli crassiusculi 2–15 mm longi angulati albo-lanati apice incrassati sursum 3–4 bracteis membranaceis flexuosis 7–12 mm longis 1 mm latis lineari-oblongis acutis uninervis extus lanuginosis ad modum calyculi. Involucrum campanulatum 7–8 mm altum circa 6 mm diametente, phyllariis 8–9 viridibus rigidulis elliptico-oblongis vel oblongis apice attenuato subite acutato margine integro sursum minute ciliato ceteris glabris vel sparsissime araneosis dorso tenuiter obsoleteque nervatis basi valde incrassatis, 6.5–8.5 mm longis exterioribus 1.6–2 mm latis interioribus margine scariosis 2.6–3 mm latis. Receptaculum circa 2.5 mm diametente alveolatum marginibus alveolorum argute dentatis. Flores radii feminei ligulati plerumque 5; corolla lutea glabra 10–14 mm longa tubulo usque ad 2.5 mm longo sed plerumque usque ad basim fisso, lamina lineari-oblonga 1.5–2 mm lata apice minute 2–3-dentata; rami styli lineares circa 2 mm longi marginibus incrassatis papilloso-stigmaticis apice attenuato subtruncato breviter papilloso-laciniato; ovarium glabrum oblongum leviter striatum 2 mm longum; pappus pallide stramineus circa 7 mm longus setis subbiseratis rigidulis strigulosis. Flores disci hermaphroditi 12–19; corolla lutea tubulosa glabra 7.5–8 mm longa tubulo 3–4 mm longo angustiusculo limbo tubuloso-campanulato profunde dentato laciniis oblongo-linearibus acutatis 3-nervatis apice minute papilloso 2.5–3 mm longis; antherae 2.5 mm longae basi breviter auriculatae; rami styli rigidi 2 mm longi marginibus supra incrassatis late papilloso-stigmatiferis apice convexo papilloso-piloso; ovarium et pappus cum in feminis similes.

*Type:* Peru, Dept. Amazonas, Prov. Chachapoyas: open cold swamp on summit of Cerros de Calla-Calla, between Leimebamba-Balsas road pass and the "camino de herradura" (2 hours walk south), 3500–3750 m alt.; wandlike shrub 0.4–1 m; occasional; rays and disc yellow; 8 July 1962, J. J. Wurdack 1196. Holotypus, US.

*Senecio aclydiphyllus* is closely related to the páramo or subpáramo species of the section *Granata* from Colombia and Ecuador. From all these species it is strikingly different in being radiate and in the unique shape of its leaves combined with their indument.

***Senecio callacallensis* Cuatr., sp. nov.**

Herba caule rhizomatoso radicefero extremo rosulam foliorum scapiferam ferenti.

Folia omnia rosulata crasse herbacea rigidula longe petiolata glabra. Petiolus 3–15 cm longus striolatus supra sulcatus glaber vel sparsissimis minutis pilis supra interdum munitus purpureus vel viridi lilacinis basi ampliato-vaginatibus subamplectens. Lamina laete viridis vel subtus purpurascens nitida ovata vel ovato-elliptica basi truncata vel cordata apice obtusa in 5–6 lobos obtuse dentatos circa 1 cm profunde incisa,

dentibus late triangularibus breviter calloso-submucronulatis vel subrotundatis 3–5 mm altis, costa lata supra plana subtus crassa nervis secundariis 5–7 utroque latere divaricatis paulo ramosis vel furcatis vix prominulis, margine subtus incrassata plerumque purpurea, utrinque glabra vel sparsis minutis pilis ad costam supra munita.

Scapi floriferi 1–3 axillares foliorum rosularum, erecti rigidi striati lilacini vel purpurascetes glabri copiose bracteolati 15–45 cm longi capitulum singulum radiatum (usque ad 6 cm diametri) erectum ferentes. Bracteolae subulatae acutae obsolete 1–3 venosae parum minuteque ciliolatae erectae vel flexuosae 15–5 mm longae 0.8–0.4 mm latae. Superne versus apicem scaporum bracteolis similibus magis numerosis ascendentibus subimbricatis 9–10 mm longis 1–1.2 mm latis basi capituli ad modum calyculi instructis. Involucrum campanulatum 14–15 mm altum plerumque purpurascete phyllariis 16–25 crassis lanceolato-oblongis acutis obsolete striato-nervatis apice minute ciliolatis ceteris glabris nitidisque, 13–14 mm longis exterioribus 1.5–1.7 mm latis interioribus 3–3.2 mm latis. Flores radii feminei ligulati circa 22; corolla lutea tubulo circa 7 mm longo glabro, lamina 20–25 mm longa 4–5 mm lata obsolete 4–5-nervata basi dorso parce pilosula reliqua glaberrima apice minute 2–3 dentata; rami styli crassiusculi complanati apice obtuse conici apiculato-penicillati. Flores disci creberrimi (circa 250) hermaproditii; corolla lutea 10–11 mm longa glabra tubulo 6–6.5 mm longo limbo basi angusto lobis linearibus profundis acutis 1-nervatis 2.2–2.5 mm longis 0.6 mm latis; antherae basi obtusae 2 mm longae; styli rami 1.8 mm longi crassi complanati apice obtuse conici apiculato-penicillati (pilis centralibus longioribus). Ovarium circa 3 mm longum breviter villosum pilis crassiusculis copiosis. Pappus albus sericeus 6 mm longus pilis minute strigulosus. Achaenia prismatico-oblonga 5-costata minute copioseque hispidula circa 4.5 mm longa 1.2 mm crassa. Receptaculum conicum circa 7 mm latum minute foveolatum.

*Type:* Peru, Dept. Amazonas, Prov. Chachapoyas: middle eastern Calla-Calla slopes, near Kms. 416–419 of Leimebamba-Balsas road, elev. 2900–3100 m; in sphagnum seepage, infrequent; petioles and peduncle basally lavender; phyllaries dull purple; rays and disc yellow; 9 July 1962, J. J. Wurdack 1277. Holotypus, US.

*Senecio callacallensis* is very closely related to *S. pimpinellifolius* HBK. and its allies, but it differs from them mainly in the form of its leaves.

#### ***Senecio jalcanus* Cuatr., sp. nov.**

Frutex scandens ramis terminalibus flexuosis viridi-brunnescentibus striatis pubescentibus araneosisque pilis pluricellularibus crassiusculis patulis acutis rectis vel paulo flexuosis circa 0.5 mm longis copiosis et pilis arachnoideis plus minusve floccosis instructis.

Folia alterna chartacea laeteviridia. Petiolus circa 10 mm longus supra sulcatus basi ampliatus rectus vel flexuosus pubescens. Lamina ovata basi rotundata vel obtusa apicem paulo angustata valde acuta

marginē repando denticulata dentibus minutis calloso-mucronulatis circa 5 mm distantibus et anguste revoluta (integra simulans) 4–7 cm longa 2.4–4 cm lata; supra juvenilis sparse pilosa araneosaque deinde glabrata sed minute granulata costa filiformi impressa pilosulaque nervis secundariis impressis paulo conspicuis minoribus obsoletis; subtus patulo-pubescentia costa valde eminenti nervis secundariis bene prominentibus 9–11 utroque latere patulis prope marginem arcuato-anastomosatis nervulis reticulum laxum prominentem et reticulum minutum leviter prominulum formantibus.

Inflorescentiae terminales composite thyrsideo-paniculatae tantum basi foliosae 10–20 cm longa, axi ramisque patulis striatis densiuscule pubescentibus araneosisque, bracteis inferioribus foliaceis sed brevibus mediis superioribusque lanceolatis vel subulatis 8–2 mm longis 2–0.5 mm latis. Ramusculi ultimi 2–8 mm longi capitula glomerata sessilia vel subsessilia congesta ferentes. Pedicelli nulli vel brevissimi (ad 0.2 mm longi), bracteolis 3–5 lanceolatis acutis 1–2 mm longis 0.3–0.6 mm latis ciliolatis calyculum formantibus. Capitula discoidea circa 4 mm longa 2 mm diametentia. Involucrum campanulatum viride phyllariis 8 oblongis apicem attenuatis subacutis sursum minute papilloso-glandulosis pilosisque margine apiceque ciliatis ceteris glabris, 2.5–2.8 mm longis. Flores omnes tubulosi hermaphroditi 9–12. Corolla 3–3.2 mm longa eburnea glabra tubulo circa 2 mm longo dentibus 0.8 mm obtusiusculis superne apiceque dense papilloso-granulatis. Antherae 1.2 mm longae basi sagittatae. Styli rami circa 1 mm longi crassiusculi complanati apice subtruncato convexo breviter papilloso-piloso-coronato. Ovarium glabrum. Pappus albus 2.3–2.4 mm longus. Receptaculum 0.8 mm diametente alveolatum.

*Type:* Peru, Dept. Amazonas, Prov. Chachapoyas: *jalca* zone 1–5 Km W of Molinopampa, 2400–2450 m alt.; vine 1.5–4 m; frequent; corollas cream; 18 July 1962; J. J. Wurdack 1375. Holotypus, US.

*Senecio jalcanus* belongs to the group of climbing *Senecios* with small heads and strongly nerved leaves. It is distinguished from closely related species (*S. subglomerosus* Green., *S. lorentensis* Cuatr., *S. urubambensis* Cabr., etc.) by its sessile heads, short involucre (2.5–2.8 mm long) with 8 phyllaries, small corollas (3–3.2 mm long), pubescent branchlets and inflorescences, and by its leaves being rather smooth above and pubescent and prominently nerved beneath.

#### ***Senecio wurdackii* Cuatr., sp. nov.**

Frutex scandens 3 m longus ramis flexuosis mediocribus glabris peridermato subochraceo papyraceo-solubili.

Folia opposita interdum alterna laete viridia glabra crassa in sicco chartacea. Petiolus 5–10 mm longus flexuosus basi dilatatus in pulvinulum articulatum incrassatus. Lamina ovata vel oblongo-ovata basi rotundata vel obtusa apice paulo attenuata obtusiuscula interdum rotundata margine angustissime subrevoluta leviter crenata dentibus brevissime calloso-

mucronulatis, utrinque laevis costa supra filiformi impressa subtus crassiuscula nervis lateralibus 5-6 utroque latere adscendentibus prope margine furcatis subtus valde tenuibus supra plerumque obsoletis.

Inflorescentiae terminales paniculatae 5-9 cm amplae folia superantes tantum basi foliosa. Rami ramulique oppositi (interdum alterni) leviter striati puberuli pilis simplicibus flexuosisque sparsis muniti. Bracteis subtendentibus infimis foliis similibus sed brevibus alteris lanceolatis acutis parce puberulis 6-3 mm longis 2-1 mm latis. Pedicelli 2-12 mm longi puberuli recti vel flexuosi bracteolis 3-5 alternis subulatis 2-3 mm longis 0.1 mm latis instructi, ad apicem tantum 1-3 bracteolis lanceolatis 3-5 mm longis ad 1 mm latis vix calyculum formantibus. Capitula discoidea homogama. Involucrum cylindricum 9-9.5 mm longum circa 4 mm diametente. Phyllaria 8 crasse herbacea viridia lineari-subulata basi incrassata apice acuto ciliato marginibus sursum breviter ciliatis reliqua glabra, 8-9 mm longa exterioribus circa 1.5 mm latis interioribus margine scarioso 2 mm latis. Flores omnes hermaphroditi 13 in capitulo; corolla viridi-lutea glabra 8-9.5 mm longa tubulo luteo-iridi 4-5 mm longo limbo tubuloso dentibus oblongis acutiusculis marginibus sursum apiceque intus minute papillosis circa 1.2 mm longis. Antherae 2.3 mm longae basi auriculatae. Rami styli crassiusculi subcomplanati circa 1.4 mm longi apice truncati penicillati. Ovarium oblongum 2.5-3 mm longum leviter nervatum glabrum. Pappus albus sericeus 5-6 mm longus pilis minute strigulosis basi coalitis. Receptaculum 2 mm diametente alveolatum marginibus alveolorum dentato-fimbriatis.

*Type:* Peru, Dept. Amazonas, Prov. Chachapoyas: approaches to Cerro Campanario NNE of Diosán, 3200-3500 m alt.; vine climbing 3 m in shrubs; corollas greenish yellow; 3 August 1962, J. J. Wurdack 1599. Holotypus, US.

*Senecio wurdackii* belongs to the group of Andean *Senecio*-climbers with rather carnose and smooth, green leaves and cylindrical, discoid heads. From all of these, the Wurdack plant differs in its unique slightly crenate blades and in its usually opposite leaves.

#### ***Senecio pleniauritus* Cuatr., sp. nov.**

Frutex vel arbuscula ad 3 m alta, ramis ultimis tortuosis, arcuato-ascendentibusque costato-striatis cicatricoso-nodosis internodiis brevibus (3-10 mm longis) nodis cum paribus auriculis rotundatis amplectentibus reflexisque satis persistentibus ornatis, extremo foliosis dilute minuteque albo-lanatis denique glabratibus.

Folia alterna simplicia coriacea petiolata. Lamina oblanceolata vel elliptico-oblanceolata apice attenuata acuta mucronulata basim versus cuneato-attenuata margine anguste revoluta dentata dentibus callosomucronatis patulis, 4-10 cm longa 1.2-2.6 cm lata; supra valde juvenilis lanuginoso arachnoidea mox glabra sed interdum nervo medio immerso lanuginoso, nervis secundariis tenuibus impressis reliquis obsoletis; subtus ochroleuca crasse denseque tomentoso-lanata costa bene elevata nervis



secundariis patulis crebris (1–2.5 mm inter se distantibus) prominulis venulis velatis. Petiolus 3–6 mm longus crassiusculus supra planus extus teres basi longe decurrens lateraliter amplectente dilatatus et biauriculatus, auriculis rotundato-cordatis cochlearis reflexis amplectentibus supra araneosis subtus tomentosolanas circa 4–8 mm longis latisque, persistentibus.

Inflorescentiae terminales corymboso-paniculatae folia excedentes 10–26 capitulis, ramis ramisque erectis striatis ochroleuco-lanuginosis bracteis subtendentibus inferioribus foliis similibus sed brevioribus sessilibusque intermediis supremisque bracteiformibus membranaceis venosis obovatis vel subovato-oblongis supra basim attenuatis basi subamplectenti exauriculatis apice acutiusculis 12–7 mm longis 8–2 mm latis supra glabris extus lanuginosis. Pedicelli erecti 5–15 mm longi striati lanuginosi sursum 1–3 bracteolis lanceolato-oblongis 6–7 mm longis 2–2.5 mm latis.

Capitula erecta heterogama radiata expansa ad 2.5 cm diametentia. Calyculus involucrium excedens vel aequilongus plerumque 4 bracteis oblongo-lanceolatis basim angustatis acutis margine integris membranaceis tenuibus subflexuosis intus glabris nervatisque extus lanuginosis 8–9 mm longis 2–3 mm latis. Involucrium campanulatum 6–8 mm altum 5–6 mm latum phyllariis 8–10 herbaceis basi incrassatis oblongis subite acutatis apice ciliatis margine integris dorso laxe lanuginosis 6–7.5 mm longis exterioribus 1.8–2.6 mm latis interioribus margine scarioso 2.8–3 mm latis. Receptaculum 2.5 diametente alveolatum marginibus alveolorum membranaceis argute dentatis. Flores radii feminei ligulati 7–9; corolla lutea 13–16 mm longa glabra tubulo 3.5–4.5 mm longo, lamina oblonga 11–13 mm longa 2.6–3.2 mm lata apice minute tridentata 5 nervis valde notatis 4 nervis intermediis tenuibus plus minusve conspicuis; styli rami 1–1.5 mm longi supra ad margines late incrassati papilloso-stigmatiferi apice subite attenuato obtusiusculo. Flores disci hermaphroditi 10–22; corolla lutea 6.5–7.5 mm longa glabra tubulo 2.5–3.2 mm longo limbo tubuloso-campanulato lobis triangulari-oblongis acutis trinervis (duobus marginalibus) 2–2.5 mm longis; antheris 2.5 mm longis basi breviter auriculatis apice appendice acutiusculo callosolancrassato. Styli rami crassiusculi 1–1.3 mm longi intus stigmatiferi extus papilloso apice breviter conico minute papilloso et papilloso-piloso-coronato. Ovarium 2 mm longum glabrum leviter nervatum. Pappus 5–6 mm longus stramineus setis uniseriatis minutissime strigulosus.

*Type:* Peru, Dept. Amazonas, Prov. Chachapoyas: upper slopes and summit of Cerro Yama-uma above Taulia, 12–15 Km SSE (145°) of Molinopampa, 3200–3450 m alt.; shrub 1.5–3 m; occasional; rays and disc yellow; 11 August 1962, J. J. Wurdack 1669. Holotypus, US.

*Senecio pleniauritus* is a striking species which lies between *Senecio* and *Gynoxys*. It is related to the *Senecios* of section *Granata* with leaf-blades like those of *S. colombianus* Cuatr. and *S. tolimensis* Sch. Bip., but it differs from all species of that section in its extraordinary auricular leaf-appendages.

*Hypochoeris mucida* Domke, var. **integrifolia** Cuatr., var. nov.

Cryptofruticuletum rosulis parvis compactis pulvinulos densos formantibus. Lamina foliorum lineari-lanceolata vel linearia integerrima vel sinuata obtusiuscula vel acutiuscula margine revoluta 5–10 mm longa 2–3.5 mm lata. Achaenia lineari-subfusiformia circa 4 mm longa basi acuta sulcato-striata minutissime tuberculato-strigosa scaberrima. Pappus albus 6 mm longus. Phyllariae interiores 10 mm longae. Palleae receptaculi 10 mm longae dimidia inferiore parte lanceolatae superiore capilari-subulatae.

*Type:* Peru, Puno: WSW of Checayani, NE of Azangaro, 4150 m alt., rainy season, 29 March 1957, H. Ellenberg 495; Holotypus, U. 1–2° NW Point 4526 ENE of Checayani, 4500 m alt., 2 April 1957, H. Ellenberg 638; Paratypus, U.