

# KEY TO THE GENUS DIPLOSTEPHIUM, WITH DESCRIPTIONS OF NEW SPECIES.

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## INTRODUCTION.

The genus *Diplostephium*, described by Kunth in 1820, was based on the single species *D. lavandulifolium*, from the mountains of Ecuador. It was distinguished from *Aster* by its distinctly double pappus, the outer squamellate-paleaceous and very short, the inner long and setose. At the hands of the early workers on Asteraceae—Cassini, Nees, and De Candolle—it became a confused medley of unrelated species having little in common beyond a more or less distinctly double pappus. Weddell, in 1857, limited it to a group of Andean shrubs or undershrubs. His concept of the genus was adopted by Bentham and Hooker and by Hoffmann, and his treatment has remained up to the present time the only synopsis of the genus. Weddell described 17 species, many of them new, and included all the species properly belonging to the genus which were known in his day, with the exception of *D. ochraceum*, which for some reason was omitted. His division of the species into groups has been followed with some amplification in the present paper, as it appears to offer the easiest method for the determination of the species. It is possible that the structure of the styles and of the outer pappus may be used for a more natural classification, but the material available in this country is not sufficient for a thorough revision at the present time.

Since Weddell's revision a considerable number of species have been described by Hieronymus and Rusby. Thirteen others are here added, chiefly from the South American collections of Pittier and Rose, bringing the total number of apparently distinct species to 40, with an additional species of doubtful position.

Although the 40 species of *Diplostephium* form a compact group of undoubtedly closely related species, they can not be said to constitute a technically well-defined genus. In a group where characters are so slight and variable as are those in the subtribe Asterinae

(Heterochromeae), and where the number of species is so great, the maintenance of a group of such size—composed of species whose relationship is evident and whose recognition is easy—as a distinct genus is justifiable. The closest relatives of *Diplostephium*, both structurally and geographically, are the genera *Hinterhubera* Schultz Bip. and *Chiliotrichum* Cass. Both are similar in habit to *Diplostephium*; the former is separable by its more or less irregularly three to five-fid ligules, the latter by the copious elongate deciduous receptacular pales, which are much more developed than those sometimes found in *Diplostephium*.

Owing to the fact that material of practically a third of the species here recognized is not available for examination in this country, it has seemed best to limit this revision of the genus to a key, with a list of the species and their synonymy and range. A thorough revision of the genus would require the reexamination of the types of many of the species published by Weddell and Hieronymus. The descriptions of Weddell, while in general excellent, are frequently deficient in measurements, which are of considerable importance in this group. Those of Hieronymus are, as usual, very full and enable his species to be keyed satisfactorily, but do not in any case state the structure of the styles.

The genus is of no importance economically, and I have not found a single native name or use recorded for any of the species. It has its center of distribution in Colombia, where 22 species occur, representing all the groups of the genus. The detailed distribution of the species is as follows: Costa Rica, 1; Colombia 22, of which 3 occur also in Ecuador and 1 doubtfully in Venezuela; Venezuela, 1, plus one doubtful record of a Colombian species; Ecuador, 9, of which 3 occur also in Colombia and 1 doubtfully in Peru; Peru, 8, of which 1 occurs also in Chile, with an additional doubtful record of an Ecuadorian species; Chile, 2,<sup>1</sup> of which 1 occurs also in Peru, while the other is of doubtful identification; Bolivia, 1 (Weddell's record of an additional species, *D. haenkei*, probably appertains to *D. sejaense*). Two species, *D. phyllicoides* (H. B. K.) Wedd. and *D. ochraceum* (H. B. K.) Nees, are of uncertain habitat, doubtless Colombian or Ecuadorian.

The most interesting feature in the morphology of *Diplostephium* is found in the variation exhibited by the styles of the disk flowers.

<sup>1</sup>The identity of one of the two species recorded by Reiche from Chile, *D. lavandulifolium*, is open to doubt. See remarks under this species, p. 74. *D. tacorense* Hieron. was described from near Tacora, Peru, but this locality is apparently now included within the limits of Chile. In any case, the species occurs so near Chile that it is likely to be found in that country. It is not accredited to Chile in this enumeration.

In some species the branches of the style are very short, papillose, and only slightly divergent. This type of style is well shown in Weddell's figure (*pl. 36, f. B, 7*) of *D. floribundum*. The opposite extreme, of long and attenuate hispid style branches, is shown in the same plate (*f. A, 3, 4*) in *D. lavandulifolium*, and the intermediate stage found in *D. anactinotum* is also figured by Weddell (*pl. 35, f. B, 6*). Although not described by Hieronymus in any of his species, the characters of the style are known in practically all the other species, and these may be listed as follows:

1. Style more or less clavate, merely bifid or even subentire, the branches very short, ovate, usually obtuse, merely papillose: *D. rosmarinifolium*, *D. baccharideum*, *D. revolutum* (all of the Series *Rosmarinifolia*); *D. rupestre*, *D. eriphorum*, *D. phyllicoides*, *D. pleistogynum*, *D. costaricense*, *D. cochense*, *D. schultzei* (Series *Rupestria*); *D. floribundum* (Series *Floribunda*); *D. ochraceum?* (Series *Denticulata*).

2. Style branches of medium length, oblong, oblong-linear, or lanceolate, acute, merely papillose (so far as known): *D. anactinotum*, *D. parvifolium* (Series *Lavandulifolia*); *D. cyparissias* (*Rosmarinifolia*); *D. weddellii* (*Rupestria*). An intermediate form between this type and the next, with linear, acute, papillose-hispidulous branches of medium length, is found in *D. umbelliferum* (*Rupestria*), and a similar form with somewhat longer style branches in *D. tacorense* (*Lavandulifolia*); another intermediate form, with lanceolate, acuminate, hispidulous branches, occurs in *D. denticulatum* (*Denticulata*).

3. Style branches elongate, linear-subulate, acuminate, hispidulous or hispid, or rarely scarcely more than papillose dorsally: *D. meyenii*, *D. adenachaenium*, *D. empetrifolium*, *D. lavandulifolium*, *D. hartwegii*, *D. macrocephalum*, *D. spinulosum*, *D. cicatricosum*, *D. oblanceolatum* (*Lavandulifolia*); *D. carabayense* (*Rosmarinifolia*); *D. sejaense*, *D. lechleri* (*Rupestria*); *D. haenkei* (*Floribunda*); *D. bicolor* (*Denticulata*). In *D. pycnophyllum* (*Lavandulifolia*) the form of the style branches is the same, but they are merely papillose, not obviously hispidulous.

The primitive type is probably the second one described, with oblong to lanceolate, acute style branches of medium length, and the other two types are doubtless derived from it. In any case, it is evident that the styles of the type first described, whether derived from the second or the third type, are the result of a process which would have as an end product the production of completely sterile disk flowers with an undivided style. Such a process, working in another tribe of Asteraceae (*Heliantheae*), has resulted in the production of a considerable number of genera now segregated as a sub-

tribe, the Melampodinae; and the members of this subtribe are shown by other characters to be derived from at least two other subtribes of Heliantheae, the Verbesininae and the Coreopsidinae. If now, in the case of *Diplostephium*, the process of sterilization were to go on to its conclusion in those species in which it has begun, and the comparatively small number of species with styles of intermediate character were to die out, or to follow their more advanced relatives, two groups would be left which might readily be taken as of generic value. The significant point is that the new genus thus formed would be in a sense of polyphyletic origin, having been derived from representatives of at least three fairly well distinguished groups of the parent genus.

This revision is based primarily on the material in the United States National Herbarium. In addition, the material in the Gray Herbarium and the herbarium of the New York Botanical Garden has been examined, through the kindness of the curators. The herbaria in which the specimens cited are deposited are indicated by letters (G=Gray Herbarium; N=U. S. National Herbarium; Y=herbarium of the New York Botanical Garden).

### SYSTEMATIC TREATMENT.

#### DIPLOSTEPHIUM H. B. K.

*Diplostephium* H. B. K. Nov. Gen. & Sp. 4: 96. pl. 335. 1820.

*Diplostephium* section *Amphistephium* DC. Prodr. 5: 273. 1836, in part.

*Simblocline* DC. Prodr. 5: 297. 1836.

*Linochilus* Benth. Pl. Hartw. 197. 1845.

Low shrubs, more or less tomentose or lanate; leaves alternate, linear to oval-ovate or oblong, entire or rarely toothed, sessile or petioled, usually coriaceous, more or less revolute-margined, tomentose or lanate at least beneath; heads solitary at tips of branchlets or corymbose-panicled, sessile or usually pedicellate, heterogamous, radiate, many-flowered, the rays white to purple, rarely yellowish (?) or brownish (?), the disk usually, or perhaps always, whitish at first, often changing to purple; involucre campanulate, several-seriate, graduated, of indurated ovate to linear-lanceolate phyllaries with thinner margins, usually strongly recurved-spreading in age; receptacle flat or slightly convex, foveolate, rarely bearing minute paleae toward the center; ray flowers pistillate, fertile, the ligules linear or elliptic, 2 or 3-denticulate, spreading or rarely very short and suberect; disk flowers hermaphrodite, fertile or often sterile, their corollas regular, tubular, with shallowly or deeply 5-fid limb; anthers cordate-sagittate at base, with ovate terminal appendages; style branches variable, now very short, erect, ovate, rounded, and merely papillose, now elongate, linear-subulate, acuminate, hispidulous; achenes of the disk narrow, 3 to 5-ribbed, of the ray more compressed, glabrous, glandular, or hispid; pappus usually copious, more or less distinctly double, the outer of short bristles or squamellate, the inner longer, setose, the bristles scabrous or barbellate, sometimes obscurely dilated toward apex.

Type species, *Diplostephium lavandulifolium* H. B. K.

## KEY TO SERIES.

- Heads solitary at tips of stem and branches..... 1. *Lavandulifolia*.  
 Heads several or many at tips of stem and branches, cymose or cymose-panicled.  
 Leaves strictly linear or slightly spatulate-linear, 2 mm. wide or less (rarely  
 slightly wider in nos. 17 and 20)..... 2. *Rosmarinifolia*.  
 Leaves linear-lanceolate to oblong or obovate, rarely linear, 3 to 30 mm. wide  
 (if rarely narrower, not strictly linear).  
 Leaves entire (rarely with a few irregular teeth in no. 24).  
 Leaves not obviously venose beneath, the veins concealed by the tomen-  
 tum..... 3. *Rupestria*.  
 Leaves evidently venose beneath..... 4. *Floribunda*.  
 Leaves regularly denticulate or dentate..... 5. *Denticulata*.

## KEY TO SPECIES.

1. *Lavandulifolia*.

- Ligules shorter than their styles and the disk; leaves elliptic or obovate, 5 to  
 10 mm. long, 3 to 4 mm. wide; Colombia..... 1. *D. anactinotum*.  
 Ligules with the lamina 3 to 13 mm. long, surpassing the styles and the disk;  
 leaves linear to oblong.  
 Involucre 4 to 8 mm. high.  
 Leaves strictly linear, 8 to 30 mm. long, 1 to 1.5 mm. wide.  
 Leaves 20 to 30 mm. long; Peru..... 2. *D. meyenii*.  
 Leaves 8 to 16 mm. long; Peru..... 3. *D. tacorense*.  
 Leaves linear-lanceolate to oblong, or if linear 8 mm. long or less.  
 Leaves chiefly linear-oblong, distinctly short-petioled; Colombia.  
 4. *D. adenachaenium*.  
 Leaves linear-lanceolate or linear, sessile.  
 Leaves acute or acutish, mucronate or mucronulate; involucre 7 to 8  
 mm. high.  
 Leaves 2.5 to 5 mm. long, 0.8 to 1 mm. wide, strongly impressed-  
 punctate above; pappus rufidulous or purplish; Ecuador,  
 Peru (?)..... 5. *D. empetrifolium*.  
 Leaves 7 to 8 mm. long, 2 mm. wide, not impressed-punctate above (?);  
 pappus fleshy white, the outer bristles yellowish white; Peru.  
 6. *D. jelskii*.  
 Leaves obtuse or acutish, not mucronate; involucre 4 to 6 mm. high.  
 Leaves with a resinous coating above; Colombia... 7. *D. parvifolium*.  
 Leaves without a resinous coat above.  
 Involucre about 6 mm. high.  
 Involucre and leaves beneath densely appressed-tomentose with  
 whitish hairs; Ecuador..... 8. *D. lavandulifolium*.  
 Involucre and leaves beneath loosely cinereous- or ferruginous-  
 tomentose; Colombia, Ecuador..... 9. *D. hartwegii*.  
 Involucre 4 to 5 mm. high.  
 Phyllaries acute, greenish; pappus reddish or violascent, 3.5  
 mm. long; disk corollas 3.5 mm. long; Ecuador.  
 10. *D. artisanense*.  
 Phyllaries acuminate, purplish at tip; pappus whitish, 5.5 mm.  
 long; disk corollas 5 mm. long; Ecuador.  
 11. *D. pycnophyllum*.

Involucre 9 to 14 mm. high.

Leaves glandular-pubescent above, not glandular-tuberculate or impressed-glandular; Peru.....2. *D. meyenii*.

Leaves glandular-tuberculate or strongly impressed-glandular above.

Leaves glandular-tuberculate but not impressed-glandular above; Ecuador.....12. *D. macrocephalum*.

Leaves strongly impressed-glandular above.

margin; Colombia, Ecuador.....13. *D. spinulosum*.

Leaves 6 to 13 mm. long, spatulate-linear, tuberculate-spinulose toward

Leaves 12 to 22 mm. long.

Leaves linear-spatulate or linear, 12 to 19 mm. long, 1.3 to 2 mm. wide, whitish or ochroleucous-tomentose beneath; Colombia.

14. *D. cicatricosum*.

Leaves oblanceolate or spatulate-oblanceolate, 15 to 22 mm. long, 2 to 4.5 mm. wide, sordid-lanate beneath; Ecuador.

15. *D. oblanceolatum*.

### 2. *Rosmarinifolia*.

Leaves viscous-tomentellous or viscidulous above.

Heads sessile; leaves not glabrescent above; involucre glabrous, its phyllaries lanceolate; Colombia.....16. *D. cyparissias*.

Heads pedicellate; leaves glabrous or glabrescent above; involucre not glabrous, its phyllaries ovate to linear-oblong.

Leaves 2.7 to 4.2 cm. long; disk achenes glabrous; pappus rufidulous; Colombia.....17. *D. rosmarinifolium*.

Leaves 1 to 2.5 cm. long; disk achenes sparsely hispid; pappus dull whitish; Colombia.....18. *D. baccharideum*.

Leaves glabrous above, not viscid.

Leaves 9 to 15 mm. long; Colombia.....19. *D. revolutum*.

Leaves 2.5 to 4.2 cm. long.

Leaves 1.5 to 2 (rarely 3) mm. wide; involucre 5 mm. high, its phyllaries oblong-lanceolate, glabrous or slightly ciliate and pubescent; achenes glabrous; Colombia.....17. *D. rosmarinifolium*.

Leaves broader; heads thrice as large; phyllaries linear-acuminate, slightly woolly; achenes hispid; Peru.....20. *D. carabayense*.

### 3. *Rupestria*.

Heads large, the involucre 10 to 12 mm. high.

Leaves linear-lanceolate, linear-spatulate, or elliptic-linear, sessile by a broad base, 3 to 7 mm. wide.

Heads pedicellate; leaves gray-tomentose beneath; Colombia, Ecuador.

21. *D. rupestre*.

Heads sessile; leaves lutescent-tomentose beneath; Colombia.

22. *D. weddellii*.

Leaves lanceolate to elliptic-ovate or oblong-lanceolate, 5 to 24 mm. wide, usually narrowed at base or petioled.

Leaves elliptic-ovate, 1.5 to 2.5 cm. long, 6 to 10 mm. wide, densely lanate-pilose beneath; Colombia.....23. *D. eriophorum*.

Leaves lanceolate or elliptic to oblong-lanceolate, 2.5 to 10 cm. long, 5 to 24 mm. wide, densely ochraceous, ferruginous, or griseous-tomentose beneath; Bolivia.....24. *D. sejaense*.

Heads smaller, the involucre 4.5 to 9 mm. high.

Leaves glabrous or early glabrate above.

Leaves very thick-coriaceous, 5 to 11 mm. long, 1.5 to 3 mm. wide.

Pedicels 2 to 3 mm. long; ligules about 20; inner phyllaries nearly glabrous; Colombia (?)----- 25. *D. phyllicoides*.

Pedicels mostly 5 to 12 mm. long; ligules 8 to 13; phyllaries all tomentose at least at apex; Colombia----- 26. *D. umbelliferum*.

Leaves thin-coriaceous or chartaceous, 1.5 to 6.5 cm. long, 4 to 15 mm. wide.

Leaves argenteous-tomentose beneath with closely appressed hairs; Peru. 27. *D. lechleri*.

Leaves canescent, rufescent, or ochroleucous-tomentose beneath.

Leaves obovate-cuneate or oblanceolate; involucre 7 to 8 mm. high.

Rays 6 to 8; disk flowers about 20; Colombia.

28. *D. rhododendroides*.

Rays about 27; disk flowers 7; Colombia----- 29. *D. pleistogynum*.

Leaves lanceolate; involucre 4.5 mm. high; Colombia.

30. *D. lehmannianum*.

Leaves cinereous-tomentellous above.

Leaves oblong, 5 to 11 mm. long; Colombia----- 26. *D. umbelliferum*.

Leaves obovate-lanceolate to linear-oblanceolate, 2 to 3.5 cm.

Leaves oblanceolate or linear-oblanceolate, 2.5 to 4 cm. long, 1.5 to 6 mm. wide; heads about 57-flowered; Costa Rica-- 31. *D. costaricense*.

Leaves obovate-lanceolate or lanceolate, 5 to 8 mm. wide or more; heads fewer-flowered.

Leaves obovate-lanceolate, 2 cm. long, 5 to 8 mm. wide; heads 12 to 15-flowered; involucre 5 mm. high; Colombia----- 32. *D. cochense*.

Leaves lanceolate, larger; heads larger, with more numerous flowers; Colombia ----- 33. *D. schultzei*.

#### 4. Floribunda.

Heads large, the involucre about 10 mm. high; leaves 3 to 8 cm. long, 8 to 22 mm. wide; Peru----- 34. *D. haenkei*.

Heads smaller, the involucre 5 to 7 mm. high; leaves smaller.

Leaves spatulate-oblanceolate or linear-oblanceolate, 1.5 to 6 mm. wide; Costa Rica----- 31. *D. costaricense*.

Leaves obovate, elliptic, or oblong, 5 to 14 mm. wide.

Leaves rounded or emarginulate at apex, not apiculate; Venezuela.

35. *D. obtusum*.

Leaves acute or obtusish, apiculate.

Leaves quickly glabrate or only slightly tomentellous above; Colombia.

36. *D. floribundum*.

Leaves cinereous-tomentose above; Peru----- 37. *D. incanum*.

#### 5. Denticulata.

Involucre about 10 mm. high----- 24. *D. sejaense*.

Involucre about 5 mm. high.

Leaves pergamentaceous, finely denticulate, prominulous-reticulate beneath.

Leaves lance-oblong, about 8.5 cm. long, 2.5 cm. wide; rays about 5; achenes glabrous; Ecuador?----- 38. *D. ochraceum*.

Leaves elliptic-oblong or elliptic-obovate, 3.5 to 6 cm. long, 1.4 to 2.5 cm. wide; rays about 13; achenes pubescent; Colombia-- 39. *D. denticulatum*.

Leaves coriaceous, rather coarsely crenate-dentate or denticulate, with only the primary veins evident beneath; Colombia----- 40. *D. bicolor*.

1. *Diplostephium anactinotum* Wedd. Chlor. And. 1: 201. pl. 35, f. B. 1857.

TYPE LOCALITY: Sierra Nevada of Santa Marta, Colombia, altitude 3,900 to 4,300 meters. Types collected by Funck (no. 390) and Schlim (no. 808).

SPECIMEN EXAMINED:

COLOMBIA (?): Without definite locality, 1842-43, *Funck & Schlim* 474 (G).

Readily distinguished by its depressed habit, very small and crowded, elliptic or obovate leaves, and short rays no longer than the disk. The flowers are whitish according to Funck, pale yellow according to Schlim. The specimen in the Gray Herbarium is labeled by Klatt as from Venezuela, but is doubtless from Colombia.

2. *Diplostephium meyenii* Wedd. Chlor. And. 1: 201. 1857.

*Limochilus meyenii* Schultz Bip.; Wedd. Chlor. And. 1: 201. 1857, as synonym.

† *Aster* (?) *trachyticus* F. Phil.; Phil. Anal. Mus. Nac. Chile Bot. 1891: 37. 1891.

TYPE LOCALITY: Cordillera of Tacora, altitude 4,000 to 4,500 meters, Department of Tacna, Peru [now Chile?]. Type collected by Meyen.

To be distinguished, among the species with solitary heads, by its linear leaves 2 to 3 cm. long and glandular-pubescent on both sides, branches glandular-pubescent above, and linear-lanceolate, glandular-pubescent, apically ciliate phyllaries. The synonym of Philippi is added on the authority of Reiche.<sup>2</sup> Judging from the original description, the reference is open to doubt. Reiche records *D. meyenii* from the provinces of Tacna and Tarapacá, Chile.

3. *Diplostephium tacorense* Hieron. Bot. Jahrb. Engler 21: 337. 1895.

TYPE LOCALITY: Plain near Tacora, Peru [now Chile?], altitude 4,000 to 4,500 meters. Type collected by Meyen.

SPECIMEN EXAMINED:

PERU: Below Pampa de Arrieros, 1914, *Rose* 18954 (N).

Closely related to *Diplostephium meyenii* Wedd., which comes from the same locality, and perhaps identical with that; the description of *D. meyenii* is not sufficiently detailed to decide the question in the absence of specimens.

4. *Diplostephium adenachaenium* Blake, sp. nov.

Shrub, densely leafy, much branched, 35 cm. high and more; stem densely lanate-tomentose with ochraceous or griseous hairs; leaves alternate; petioles broad but distinct from the blade, 1.5 mm. long; blades spreading or reflexed, elliptic or linear-oblong to spatulate-oblong, 7 to 11 mm. long, 1.5 to 3 mm. wide, obtuse or acutish, callous-apiculate, at base rounded or cuneate-rounded, strongly coriaceous, entire, strongly revolute, above dark green, glabrous, smooth, somewhat shining, beneath densely and griseously lanate-tomentose, the costa impressed above, concealed beneath; heads solitary at tips of the numerous very short branchlets, about 2.7 cm. wide; disk subglobose, 8 to (fruit) 14 mm. high, 10 to (fruit) 15 mm. thick; involucre about 5-seriate, rather slightly graduated, 8 mm. high, the phyllaries lanceolate, acute (outer) to acuminate, densely pilose-tomentose on their exposed portions, not lacerate-ciliate, the innermost sometimes purplish-tinged at tip; rays about 18, purplish (?), sparsely hispidulous at base of limb, the tube 3 mm. long, the lamina linear-elliptic, 12 mm. long, 1.8 mm. wide; disk corollas numerous, purplish at tip, sparsely pilose toward base of throat, 7 mm. long (tube 2.5 mm., throat 3 mm.,

<sup>2</sup> Fl. Chil. 3: 344. 1902.



teeth 1.5 mm.); achenes of ray and disk similar, densely stipitate-glandular, sometimes with a few short hairs above, 1.5 to 2 mm. long; pappus rufidulous tinged with purplish, the squamellae 1 to 1.3 mm. long, the awns 7 to 8 mm. long; style branches long, linear-subulate, hispidulous.

Type in the U. S. National Herbarium, no. 531,603, collected on the Páramo de Moras, between Mozoco and Pitayó, Tierra Adentro, State of Cauca, Colombia, altitude 3,000 to 3,500 meters, February, 1906, by H. Pittier (no. 1408).

Well distinguished by its chiefly linear-oblong, very thick, distinctly short-petioled leaves.

5. *Diplostephium empetrifolium* Blake, sp. nov.

PLATE 21.

Undershrub, up to 27 cm. high or more, much branched; stem stout, denudate below, dull-tomentose, glabrescent; branches densely ochraceous-lanate-tomentose, densely leafy; leaves alternate; blades spreading or deflexed, linear, 2.5 to 5 mm. long, 0.8 to 1 mm. wide, acute or acutish, callous-mucronulate, sessile, thick-coriaceous, entire, revolute-margined, above green, densely impressed-glandular, glabrous or quickly glabrate, beneath densely ochraceous-lanate-tomentose, the costa often prominulous above, concealed beneath; heads solitary at tips of branches, short-peduncled, about 2 cm. wide; disk turbinate-hemispheric, 7 to 8 mm. high, 10 to (fruit) 15 mm. thick; involucre about 5-seriate, graduated, 7 to 8 mm. high, the phyllaries ovate (outer) to lanceolate or linear-lanceolate, acute to acuminate, the outer loosely arachnoid-pilose and lacerate-ciliate, the inner lacerate-ciliate, densely gland-dotted along midline, otherwise nearly glabrous, all whitish with strong costa; rays about 20, bluish (?), essentially glabrous, the tube 1.8 mm. long, the lamina linear-elliptic, 13 mm. long, 2.5 mm. wide; disk corollas numerous, whitish (?) or purplish, essentially glabrous except for the glandular teeth, 5.2 mm. long (tube 1.5 mm., throat 3 mm., teeth 0.7 mm.); achenes of ray and disk similar, hispidulous and densely gland-dotted, 1.3 to 2 mm. long; pappus rufidulous or strongly purplish, the outer bristles 1 mm. long, the inner 5.5 mm. long; style branches long, linear-subulate, hispidulous.

Type in the U. S. National Herbarium, no. 534,769, collected on the Páramo de Laragero, Province of Loxa, Ecuador, September, 1864, by W. Jameson. Duplicate in the herbarium of the New York Botanical Garden.

ADDITIONAL SPECIMENS EXAMINED:

ECUADOR: Between Cuenca and Loxa, altitude 3,660 meters, *Jameson* (G).

Vicinity of Tablón de Oña, 1918, *Rose, Pachano & Rose* 23100 (N, Y).

Loxa, *Seemann* (G).

PERU (?): Without definite locality, *Lobb* 197 (G).

This well-marked species is nearest *D. jelskii* Hieron., of Peru, which has leaves 7 to 8 mm. long and 2 mm. wide, sessile heads, and shorter rays (lamina 8 mm. long). Rose's plant differs from the other collections cited in its bright rosy-purple pappus and somewhat more strongly mucronulate leaves, but is not worthy of distinction.

EXPLANATION OF PLATE 21.—*Diplostephium empetrifolium*. Type specimen. Natural size.

6. *Diplostephium jelskii* Hieron. Bot. Jahrb. Engler 36: 476. 1905.

TYPE LOCALITY: Near Cutervo, Peru. Type collected by Jelski (no. 622).

Apparently nearest *D. empetrifolium* Blake, but distinguished by its larger leaves. Hieronymus does not mention the impressed glands, which are so conspicuous in *D. empetrifolium*; if these are absent, the species can be separated by this character alone. Hieronymus describes the receptacle as provided with minute, obovate, obtuse, dentate-lacerate pales about 0.5 mm. long.

7. *Diplostephium parvifolium* Blake, nom. nov.

*Diplostephium microphyllum* Wedd. Chlor. And. 1: 201. 1957. Not *D. microphyllum* Nees, 1832.

*Linochilus microphyllus* Schultz Bip.; Wedd. Chlor. And. 1: 201. 1857, as synonym.

TYPE LOCALITY: Sierra Nevada of Santa Marta, altitude 3,000 meters, Colombia. Type collected by Funck (no. 388).

To be recognized by its small, acutish, lanceolate leaves (5 mm. long, 2 mm. wide), covered with a resinous layer above, its small heads (only 1 cm. wide in flower), and its short ligules (the lamina 3 mm. long, violet). By some error the locality is given by Weddell as "Venezuela: province de Caracas, dans la Sierra-Nevada de Santa Marta !, h. 3,000 m."

8. *Diplostephium lavandulifolium* H. B. K. Nov. Gen. & Sp. 4: 97. pl. 335. 1820.

*Diplopappus lavandulifolius* Cass. Dict. Sci. Nat. 25: 96. 1822.

*Aster lavandulaceus* Willd.; Nees, Gen. & Sp. Aster. 189. 1832, as synonym.

*Linochilus lavandulifolius* Schultz Bip.; Wedd. Chlor. And. 1: 200. 1857, as synonym.

TYPE LOCALITY: Near Mulalo, altitude 2,930 meters, near the base of Mount Illinissa and Mount Cotopaxi, Ecuador.

ILLUSTRATION: Wedd. Chlor. And. 1: pl. 36, f. A.

Distinguished by its linear or elliptic-linear leaves, 4 to 8 mm. long, 1 to 2.5 mm. wide, sparsely tomentellous above and densely appressed-white-tomentose beneath, and its lanate-tomentose phyllaries. Hieronymus records it from Mount Imbabura and Mount Cayambe, Ecuador, altitude 4,000 meters or more. Reiche<sup>2</sup> records the species from Ecuador, Bolivia, Peru, and the Province of Tacna, Chile, but this requires confirmation.

9. *Diplostephium hartwegii* Hieron. Bot. Jahrb. Engler 21: 337. 1895.

TYPE LOCALITY: Saraguru Mountains, Ecuador. Type collected by Hartweg (no. 763).

## SPECIMENS EXAMINED:

COLOMBIA: Province of Cauca, altitude 3,400 to 3,800 meters, *Lehmann* 4608 (Y).

ECUADOR: Mount Pichincha, altitude 3,660 to 4,575 meters, 1855, *Couthouy* (G, Y).

Closely related to *D. lavandulifolium* H. B. K., but distinguishable by its loosely cinereous or ferruginous-tomentose involucre and lower leaf-surface. Hieronymus records it also from Río Bobo, between Pasto and Laguna Grande de Cocha, Colombia. This species may prove to be the same as *D. lavandulifolium*; the type collection was originally referred to that species by Bentham,<sup>3</sup> with some hesitation, and by Weddell. Bentham states that two varieties, answering from his description to the two species as discriminated by Hieronymus, were included in Hartweg's no. 763.

10. *Diplostephium antisanense* Hieron. Bot. Jahrb. Engler 21: 338. 1895.

TYPE LOCALITY: Near Las Cimarronas, Páramo of Mount Antisana, altitude 4,000 meters, Ecuador. Type collected by Stuebel (no. 235a).

Distinguished from *D. lavandulifolium* by its smaller heads and leaves (5 to 6 mm. long, 2 mm. wide); from *D. pycnophyllum* by the characters noted in the key.

<sup>2</sup> Fl. Chil. 3: 344. 1902.

<sup>3</sup> Pl. Hartw. 136. 1844.

11. *Diplostephium pycnophyllum* Blake, sp. nov.

Shrub, with many short branches; stem stout, densely tomentose with ochraceous hairs, becoming griseous; leaves alternate, very crowded; blades linear or elliptic-linear, 5 to 8 mm. long, 0.8 to 1.5 mm. wide, obtuse, callous-tipped but not mucronulate, sessile, coriaceous, entire, revolute-margined, above light green, glabrous, not at all glandular, beneath densely tomentose with ochraceous or cinereous hairs, the costa impressed above, concealed beneath; heads solitary at tips of the numerous short branchlets, sessile, about 1.5 cm. wide; disk subglobose, 6 to 7 mm. high, 6 to (fruit) 9 mm. thick; involucre about 4-seriate, slightly graduated, 4 to 5 mm. high, the outermost phyllaries lanceolate or linear, densely pilose-tomentose, the middle ones linear-lanceolate, acuminate, pilose-tomentose on their exposed portions, the innermost similar, purplish above, sparsely tomentose toward apex or essentially glabrous; rays about 20, pale (in the dried state), sparsely pubescent toward tip of tube, the tube 2.5 mm. long, the lamina linear-elliptic, 7 mm. long, 1.2 mm. wide; disk flowers about 16, apparently whitish, sparsely pubescent near the base of throat, 5 mm. long (tube 1.5 mm., throat 2.8 mm., teeth 0.7 mm.); achenes of ray and disk (immature) similar, hispidulous, sparsely glandular above, 1.2 to 1.7 mm. long; pappus dull whitish, the outer bristles 1 mm. long, the inner 5.5 mm. long; style branches elongate, linear-subulate, papillose, scarcely hispidulous.

Type in the U. S. National Herbarium, no. 1,023,325, collected on a páramo in the vicinity of Cañar, Ecuador, September 16, 1918, by J. N. Rose and G. Rose (no. 22750). Duplicate in the herbarium of the New York Botanical Garden.

Of the *D. lavandulifolium* group, allied to *D. antisanense* Hieron., which has merely acute greenish phyllaries, reddish or violascent pappus only 3.5 mm. long, smaller disk corollas (3.5 mm. long), and shorter rays (lamina 4.5 mm. long).

12. *Diplostephium macrocephalum* Blake, sp. nov.

PLATE 22.

Shrub, with numerous short branchlets; stem stoutish, griseously pilose-tomentose; leaves alternate; blades oblanceolate or spatulate-oblanceolate, 8 to 13 mm. long, 1.5 to 3 mm. wide, obtuse, obscurely or not at all apiculate, sessile, strongly coriaceous, entire, revolute-margined, above dark green, sordidly pilose-tomentose, glabrescent, tuberculate especially toward margin, not impressed-glandular, beneath densely lanate-tomentose with ochraceous or griseous hairs, the costa impressed above, at length visible beneath; heads solitary at tips of branchlets, sessile, about 3 cm. wide; disk subglobose, about 13 mm. high and thick; involucre about 6-seriate, graduated, 12 to 14 mm. high, the outermost phyllaries ovate, acute, somewhat lanate-pilose, the inner lanceolate, acute or acuminate, glabrous except for the lacerate-ciliate margin; rays 30 or more, sparsely hispidulous toward base of limb, the tube 2 mm. long, the lamina linear-elliptic, 13 mm. long, 2 mm. wide; disk corollas numerous, whitish (?), sparsely hispidulous toward base of throat, glandular on teeth, 7 mm. long (tube 2.2 mm., throat 4 mm., teeth 0.8 mm.); achenes of ray and disk similar, hispid and gland-dotted, 2 mm. long; pappus purplish, the squamellae 0.8 to 1 mm. long, the bristles 7 to 8 mm. long; style branches elongate, linear-subulate, hispidulous.

Type in the U. S. National Herbarium, no. 1,023,357, collected in the vicinity of Nabón, Province of Azuay, between Cuenca and Loxa, Ecuador, September 25, 1918, by J. N. Rose, A. Pachano, and G. Rose (no. 22998).

Distinguished from related large-headed species of its group by having the leaves not impressed-glandular above.

EXPLANATION OF PLATE 22.—*Diplostephium macrocephalum*. Type specimen. Natural size.

13. *Diplostephium spinulosum* Wedd. Chlor. And. 1: 200. 1857.? *Diplostephium glandulosum* Hieron. Bot. Jahrb. Engler 21: 339. 1895.

TYPE LOCALITY: Alpine pastures, Andes of Quito, altitude 4,200 meters, Ecuador. Type collected by Jameson (no. 406 of 1856).

## SPECIMENS EXAMINED:

COLOMBIA: Mount Azufra, southern Cordillera, May 18, 1876, *André* (G).ECUADOR: Cerro de Pillzhum, Province of Azuay, altitude 3,965 meters, *Jameson* (G).

Weddell's description of this species has been amplified by Hieronymus<sup>4</sup> on the basis of specimens collected by Sodiro near Riobamba, Ecuador. On comparing this with the original description of *D. glandulosum*, I am unable to find any differences which seem to be of specific value. The slight differences indicated by the two descriptions are broken down by the two specimens evidently referable to this species which I have examined. Hieronymus records his species from Colombia (*Stuebel* 445b, 253d, 284c) and Ecuador (*Stuebel* 272a, *Lehmann* 589).

14. *Diplostephium cicatricosum* Blake, sp. nov.

PLATE 23.

Undershrub, several-stemmed, about 27 cm. high; stems stout, branched above the middle, densely covered with persistent leaf-bases 1 to 2 mm. long, at first densely lanate-tomentose with whitish hairs, glabrescent, densely leafy above; leaves alternate; blades linear or spatulate-linear, (8) 12 to 19 mm. long, 1.3 to 2 mm. wide, obtuse, callous-apiculate, sessile, revolute-margined, coriaceous, entire, above green, densely impressed-glandular, at first lanate-tomentose, soon glabrate, beneath whitish or ochraceous-tomentose, the costa impressed above, conspicuous beneath; heads solitary at tips of branchlets, about 1.8 cm. wide; disk turbinate-subglobose, 11 mm. high, 9 to 15 mm. thick; involucre about 6-seriate, graduated, 11 to 13 mm. high, the outermost phyllaries lance-ovate, acuminate, more or less pilose-tomentose and lacerate-ciliate, the inner lanceolate, acuminate, lacerate-ciliate, sparsely pilose-tomentose dorsally, all whitish; rays purplish (?), not well seen; disk corollas numerous, purplish, sparsely hispidulous at base of throat, 6.8 mm. long (tube 2.5 mm., throat 3.5 mm., teeth 0.8 mm.); disk achenes hispidulous and densely gland-dotted, 2.5 mm. long; pappus purplish, the squamellae 1 mm. long, the awns 6.5 mm. long; style branches elongate, linear-subulate, hispidulous.

Type in the U. S. National Herbarium, no. 531,325, collected on the Páramo de Buena Vista, Huila group, Central Cordillera, State of Cauca, Colombia, altitude 3,000 to 3,600 meters, January, 1906, by H. Pittier (no. 1128).

Characterized by its low stems, which are denuded of leaves for most of their length and covered by the persistent leaf bases.

EXPLANATION OF PLATE 23.—*Diplostephium cicatricosum*. Type specimen. Natural size.

15. *Diplostephium oblanceolatum* Blake, sp. nov.

PLATE 24.

Shrub; stem stoutish, densely lanate-tomentose with matted brownish hairs; leaves alternate, often with short branchlets bearing reduced leaves in their axils; blades oblanceolate or spatulate-oblanceolate, the larger 15 to 22 mm. long, 3.5 to 4.5 mm. wide, obtuse, callous-mucronulate, gradually narrowed to the sessile base, strongly coriaceous, entire, somewhat revolute-margined, above green, densely impressed-glandular, sparsely tuberculate-setulose toward margin, at first lanate-tomentose, quickly glabrate, beneath densely ochraceous-lanate, the costa pale, evident above, concealed beneath; leaves of the branchlets

<sup>4</sup> Bot. Jahrb. Engler 29: 22. 1900.

similar, 7 to 10 mm. long; heads solitary on leafy branches crowded toward tip of stem, about 2.2 cm. wide; disk campanulate-subglobose, in fruit about 1.3 cm. high, 1.5 cm. thick; involucre about 5-seriate, graduated, 11 to 12 mm. high, the outermost phyllaries ovate, pilose-tomentose dorsally, the inner lanceolate, acute to acuminate, whitish, slightly lacerate on margin, glabrous or essentially so; rays 15 or more, purplish (?), the tube glabrous, 2 mm. long, the lamina narrowly elliptic, 11 mm. long, 2.5 mm. wide, tridenticulate, sparsely hispidulous at base; disk corollas numerous, purplish above, sparsely hispidulous toward base of throat, 6.5 mm. long (tube 1.8 mm., throat 3.6 mm., teeth 1.1 mm.); achenes of ray and disk similar, densely hispid-pilose, 1.8 to 2 mm. long; pappus rufidulous, the outer of about 20 linear or linear-lanceolate squamellae 0.7 to 1 mm. long, the inner of about 45 setae, about 7 mm. long; style branches elongate, linear-subulate, hispidulous.

Type in the Gray Herbarium, collected at Chuquiribamba, Ecuador, altitude 3,000 meters, November, 1876, by Édouard André (no. 1). Photograph and fragments in the U. S. National Herbarium.

Related to *D. cicatricosum* Blake, which has narrower linear or linear-spatulate leaves only 1.3 to 2 mm. wide, less densely lanate stems, and rather densely lacerate-ciliate phyllaries. The type was distributed as *Diplostephium mandoni*, a very different species with corymbose-panicked heads.

EXPLANATION OF PLATE 24.—*Diplostephium oblanceolatum*. Type specimen. Natural size.

16. *Diplostephium cyparissias* Wedd. Chlor. And. 1: 203. 1857.

TYPE LOCALITY: Sierra Nevada of Santa Marta, Colombia, altitude 3,000 meters. Type collected by Funck (no. 387).

Distinguished among the species of its group by its leaves, which are viscos-tomentellous above and yellowish or whitish-tomentose beneath, its sessile heads, and glabrous involucre. As in the case of *D. parvifolium*, the habitat of this species is erroneously given by Weddell as Venezuela, Province of Caracas, Sierra Nevada of Santa Marta.

17. *Diplostephium rosmarinifolium* (Benth.) Wedd. Chlor. And. 1: 202. 1857.

*Linochilus rosmarinifolius* Benth. Pl. Hartw. 197. 1845.

TYPE LOCALITY: Near Bogotá, Colombia.

SPECIMEN EXAMINED:

COLOMBIA: Near Bogotá, *Hartweg* 1092 (type collection; Y, photo and fragm. N).

Closely related to *D. baccharideum*, but distinguished by its much longer leaves, which are rather densely dotted above with sessile glands. The genus *Linochilus* of Bentham was based on this species and placed in the Mutisieae, the anthers being described as very shortly bisetose at base, and the ligules as bilabiate. Examination of the type number shows that the anthers are merely minutely sagittate at base, and that the ligules are not truly bilabiate, but bear inside the tube a couple of exerted linear appendages which probably represent abortive stamens.

18. *Diplostephium baccharideum* Blake, sp. nov.

PLATE 25.

Shrub; stem branched, denudate below, tuberculate with the prominent leaf scars, densely cinereous-tomentose, glabrescent; leaves alternate; blades linear, 10 to 25 mm. long, 1 to 2 mm. wide, acutish, callous-apiculate, sessile, coriaceous, entire, revolute-margined, spreading, above deep green, quickly glabrate, more or less lepidote-glandular, beneath densely ochraceous or cinereous-tomentose, the costa prominulous or impressed above, concealed beneath; heads about 1 cm. wide, in dense cymose panicles 2 to 3.5 cm. wide at tips of branches,

on ochraceous-tomentose pedicels 3 to 7 mm. long; disk 7 mm. high, 5 to (fruit) 8 mm. wide; involucre about 5-seriate, graduated, 5 to 6 mm. high, the outermost phyllaries ovate, obtuse, cinereous-tomentose chiefly along midline, the inner oblong-ovate to linear-oblong, obtuse, ciliolate, somewhat viscid, sparsely tomentose on midline near apex or the innermost nearly glabrous, the costa greenish or sometimes purplish toward apex; rays about 11, the tube pubescent, 3 mm. long, the lamina linear-elliptic, 2.5 mm. long; disk flowers about 10, the corollas glandular-pubescent on throat, 4.8 mm. long (tube 2.2 mm. long, throat 1 mm. long, teeth 1.6 mm. long); ray achenes essentially glabrous, 1.5 mm. long; disk achenes sparsely hispid, 2 to 2.7 mm. long; pappus dull whitish, the outer bristles 0.8 to 1 mm. long, the inner 4 mm. long; style branches very short, elliptic-ovate, papillose.

Type in the U. S. National Herbarium, no. 888,707, collected at Montserrate, vicinity of Bogotá, Colombia, 1917, by Brother Ariste-Joseph (no. B34).

ADDITIONAL SPECIMENS EXAMINED:

COLOMBIA: Moist cañon above Chapinero, Department of Cundinamarca, altitude 2,800 to 2,900 meters, September, 1917, *Pennell* 2008 (N, Y). Bogotá, 1914, *Ariste-Joseph* A50(N). Without definite locality, *Triana* 4(G); *Funk & Schlim* 1286(G); *Ariste-Joseph* A48(N). Shrub zone, below Parama de Chaquiro, Department of Bolívar, altitude 2,900 to 3,100 meters, February, 1918, *Pennell* 4336 (Y).

The specimens of *Triana* and of *Funk* and *Schlim* in the Gray Herbarium are fragments in the Klatt collection of Compositae, where both were labeled *Diplostephium rosmarinifolium*. The *Funk* and *Schlim* sheet was labeled Venezuela, but is doubtless from Colombia. *Weddell* cites *Funk* and *Schlim* 1289, from Colombia (to which collection the Klatt specimen may really appertain), under *D. rosmarinifolium*. *D. rosmarinifolium*, of which I have examined a specimen of the type collection in the herbarium of the New York Botanical Garden, is closely related, but has leaves 2.7 to 4.2 cm. long, glabrous achenes, and rufidulous pappus. The var.  $\beta$  with shorter leaves, mentioned by *Weddell*, may be the same as the new species here described.

EXPLANATION OF PLATE 25.—*Diplostephium baccharideum*. Type specimen. Natural size.

19. *Diplostephium revolutum* Blake, sp. nov.

Low shrub, 25 cm. high or more; stem stout, much branched above, glabrescent, tuberculate with the prominent leaf scars; branchlets somewhat viscid, essentially glabrous, angled, densely leafy; leaves alternate; blades linear or slightly spatulate-linear, 9 to 15 mm. long, 1 to 2.3 mm. wide, acute or acutish, callous-tipped but scarcely apiculate, sessile, coriaceous, entire, strongly revolute, above deep green, glabrous, obscurely punctate, beneath ochraceous or cinereous-tomentose with closely felted hairs, the costa usually impressed above, evident beneath; heads small, about 8 mm. wide, in dense cymose panicles 1 to 2 cm. wide at tips of branches; pedicels nearly glabrous, 1 to 6 mm. long; disk 4 to (fruit) 6 mm. high, 3 to (fruit) 8 mm. thick; involucre about 4-seriate, graduated, 4 to 5.5 mm. high, the outermost phyllaries ovate, acute, ciliolate, somewhat tomentose, the inner lanceolate to linear-lanceolate, acute, arachnoid-ciliolate, somewhat viscid, purplish-tinged toward tip, all whitish and subcoriaceous, with obscure costa; rays about 11, whitish (in the dried state), the tube puberulous with several-celled hairs, 2.5 mm. long, the lamina linear, 3 mm. long, 0.5 mm. wide; disk corollas about 11, whitish (when dry), pubescent on the throat with several-celled hairs, 4.7 mm. long (tube 1.5 mm., throat 1.5 mm., not thicker than the tube, teeth ovate-lanceolate, 1.7 mm.);

ray achenes sparsely glandular, 1.2 mm. long; disk achenes glandular and very sparsely hispidulous, 2 mm. long; pappus dull whitish, the outer bristles 1 to 1.5 mm. long, the inner 4 mm. long; style branches very short, elliptic-ovate, papillose.

Type in the U. S. National Herbarium, no. 888,441, collected at Bogotá, Colombia, 1917, by Brother Ariste-Joseph (no. A233).

ADDITIONAL SPECIMENS EXAMINED:

COLOMBIA: Laguna de Verjón, vicinity of Bogotá, October, 1917, *Ariste-Joseph* A78(N).

Allied to *D. rosmarinifolium* (Benth.) Wedd., which has the branches tomentose, at least when young, and leaves 27 to 42 mm. long.

20. *Diplostephium carabayense* Wedd. Chlor. And. 1: 202. 1857.

TYPE LOCALITY: Alpine region, above San Juan del Oro, Province of Carabaya, Peru. Type collected by Weddell.

Said to be near *D. rosmarinifolium*, but with somewhat broader leaves, heads thrice as large (2 cm. wide in flower), linear acuminate phyllaries slightly woolly outside, and hispid achenes.

21. *Diplostephium rupestre* (H. B. K.) Wedd. Chlor. And. 1: 206. 1857.

*Aster rupestris* H. B. K. Nov. Gen. & Sp. 4: 94. pl. 354. 1820.

*Tetramolopium* ? *rupestre* Nees, Gen. & Sp. Aster 202. 1832.

*Aster pichinchensis* Willd.; Nees, Gen. & Sp. Aster. 203. 1832, as synonym.

TYPE LOCALITY: Mount Pichincha and Mount Antisana, altitude 3,300 meters, Ecuador.

SPECIMENS EXAMINED:

COLOMBIA: Páramo de Ruiz, Department of Tolima, altitude 3,800 to 4,300 meters, 1917, *Pennell* 3036 (N, Y); in 1918, altitude 3,000 to 3,500 meters, *Dawe* 762 (Y). Without definite locality, *Triana* 89 (G).

ECUADOR: Mount Pichincha, altitude 4,115 to 4,575 meters, 1855, *Couthouy* (G, Y). Summit of Mount Pichincha, *Jameson* 13 (G).

22. *Diplostephium weddellii* Blake, nom. nov.

*Diplostephium sessiliflorum* Wedd. Chlor. And. 1: 204. 1857. Not *D. sessiliflorum* Spreng. 1826.

TYPE LOCALITY: Sierra Nevada, altitude 3,800 to 4,300 meters, Province of Río Hacha, Colombia. Type collected by Schlim (no. 806).

Distinguished from its closest ally, *D. rupestre*, by its sessile heads and by its leaves, which are glabrous and shining above and densely lutescent-tomentose beneath. In *D. rupestre* the leaves are usually dull and with some persistent hairs above, and cinereous or in old specimens sometimes slightly yellowish-tomentose beneath. According to Schlim, the flowers of *D. weddellii* are yellow, but it is probable that this statement has reference only to the color of the disk.

23. *Diplostephium eriophorum* Wedd. Chlor. And. 1: 206. pl. 36, f. C. 1857.

TYPE LOCALITY: Mount Tolima, near the limit of perpetual snow, Colombia.

SPECIMENS EXAMINED:

COLOMBIA: Mount Tolima, *Goudot* (type collection; G). Dry open ground. Páramo de Ruiz, Department of Tolima, altitude 3,800 to 4,300 meters, 1917, *Pennell* 3029 (N, Y).

In this species the branchlets are glabrate and denudate below, at apex very densely leafy and densely long-lanate. The flowers, according to Pennell's label, are white. The pappus is comparatively sparse, and the bristles, although very unequal, are sometimes in essentially a single series.

**24. *Diplostephium sejaense* (Kuntze) Blake.***Aster sejaensis* Kuntze, Rev. Gen. Pl. 3<sup>2</sup>: 131. 1898.*Diplostephium mandoni* Rusby, Bull. N. Y. Bot. Gard. 4: 383. 1907.*Diplostephium liabioides* Rusby, Bull. N. Y. Bot. Gard. 4: 384. 1907.*Diplostephium atropurpureum* Rusby, Bull. N. Y. Bot. Gard. 4: 384. 1907.

TYPE LOCALITY: Near La Seja, altitude 300 meters, between Cochabamba and Santa Rosa, Bolivia.

## SPECIMENS EXAMINED:

BOLIVIA: Near Sorata, foot of Mount Illampu, Province Larecaja, March, 1858, *Mandon* 215 (type collection of *D. mandoni*; G, Y, photo. and fragm. N). Unduavi, altitude 2,440 meters, 1885, *Rusby* 1660 (Y); in 1894, *Bang* 2496 (type of *D. liabioides*; Y, photo. N); in 1910, *Buchtien* 3030 (N, Y), 3031 (Y); in 1914, altitude 3,200 meters, *Buchtien* 478 (Y). La Seja, April, 1892, *Kuntze* (types; N, Y). Without definite locality, *Bang* 2030 (type of *D. atropurpureum*; Y, photo. and fragm. N); *Bang* 2895 (Y).

The leaves in this species are narrowly elliptic to lance-elliptic, 2.5 to 10 cm. long, 0.5 to 2.4 cm. wide, green and glabrous above (except for the base of the costa), beneath densely ochroleucous or cinereous-tomentose, with the veins concealed or very obscure. *D. liabioides* was separated chiefly on the strength of its irregularly toothed leaves, and *D. atropurpureum* on the basis of several supposed differences of no real consequence. As to the tothing of the leaves, all the specimens which bear toothed leaves bear also entire ones, and I find one or two toothed leaves in the type number of *D. mandoni*. In the type of *D. atropurpureum* the receptacle, as noted by Rusby, bears toward the center a number of linear-subulate attenuate pales about 1.5 mm. long. These are shown by some but not all of the other collections examined. Both Kuntze and Rusby describe the ray and disk flowers as purplish (or "blue"). In some specimens of this and other species dissected I have found purplish disk flowers in the same head with obviously less mature whitish ones. It is evident that in this genus, as in many other Astericeae, the disk flowers are often, if not always, white at first, becoming purplish in age.

The first name applied to this species was "*Diplostephium mandonii* Schultz Bip."\* This has been used in several occasions, but was first provided with description by Rusby in 1907, some years after the publication of *Aster sejaensis* by Kuntze. It may be noted that Rusby's reference of *Mandon* 219 to *D. mandoni* and *Mandon* 215 to *D. atropurpureum* is based upon an error in the labels, as the only *Diplostephium* distributed by Mandon was his no. 215.

**25. *Diplostephium phyllicoides* (H. B. K.) Wedd. Chlor. And. 1: 205. 1857.***Aster phyllicoides* H. B. K. Nov. Gen. & Sp. 4: 93. 1820.*Tetramolopium* ? *phyllicoides* DC. Prodr. 5: 262. 1836.*Linochilus phyllicoides* Schultz Bip.; Wedd. Chlor. And. 1: 205. 1857, as synonym.

TYPE LOCALITY: "Nova Hispania?" (Colombia?, according to Weddell).

Related to *D. umbelliferum* Blake, but distinguished by its very short pedicels, more numerous rays, and nearly glabrous involucre.**26. *Diplostephium umbelliferum* Blake, sp. nov.**

PLATE 26.

Shrub, 25 cm. high or more; stem stout, branched above, denudate below, ochraceous or fuscous-tomentose, glabrescent below, tuberculate with the conspicuous leaf scars; leaves alternate, spreading or reflexed; blades linear-

\* *Linnaea* 34: 534. 1865-66.



oblong or narrowly elliptic-oblong, 5 to 11 mm. long, 1.8 to 3 mm. wide, obtuse or acutish, usually callous-apiculate, rounded at the sessile base, thick, strongly coriaceous, entire, revolute-margined, above deep green, quickly glabrate, obscurely viscidulous, smooth, not impressed-glandular, beneath densely ochraceous, brownish, or fuscous-tomentose, the costa above usually prominulous toward base, evanescent toward tip, concealed beneath; heads about 1.2 cm. wide, several or numerous in umbelliform cymes 2 to 3.5 cm. wide at tips of branches; pedicels densely tomentose, 3 to 12 mm. long; disk 7 to 9 mm. high, 5 to (fruit) 10 mm. thick; involucre about 5-seriate, graduated, 6 mm. high, the outermost phyllaries ovate, acutish, densely arachnoid-tomentose, the inner lanceolate to linear-lanceolate, acute or acutish, densely or rarely sparsely arachnoid-tomentose toward tip, arachnoid-ciliate, more or less glandular, all firm and purplish or black-purplish on margin and toward tip; rays 8 to 13, "purple blue," sparsely puberulous at apex of tube, the tube 4 mm. long, the lamina linear-elliptic, 5 mm. long, 1.5 mm. wide; disk flowers 6 to 10, their corollas whitish (when dry) or purplish in age, puberulous on throat, 6 mm. long (tube 2 mm., throat 1.6 mm., not thicker than the tube, teeth 2.4 mm.); achenes sparsely glandular, 1.5 to 2.5 mm. long; pappus whitish or ferruginous, the outer bristles few, about 1 mm. long, the inner 4.5 to 5 mm. long; style branches of medium length, linear, acute, papillose-hispidulous.

Type in the U. S. National Herbarium, no. 888,756, collected at Guadalupe, near Bogotá, Colombia, 1917, by Brother Ariste-Joseph (no. A77).

ADDITIONAL SPECIMENS EXAMINED:

COLOMBIA: Montserrate, near Bogotá, 1852, *Holton* 326 (G, Y); in 1909, *Ariste-Joseph* A35(N). Quebrada de la Vieja, near Bogotá, 1909, *Ariste-Joseph* A34(N). Bushy slope, Mount Guadalupe, above Bogotá, alt. 2,800 to 3,000 meters, 1917, *Pennell* 1916 (Y). Without definite locality, *Triana* 1956(Y).

This species is nearest *D. phyllicoides* (H. B. K.) Wedd., which has shorter pedicels (2 to 3 mm. long), more numerous ligules (about 20), and nearly glabrous inner phyllaries. In *D. phyllicoides*, moreover, the style of the disk flowers is described by Weddell as clavate and subentire.

EXPLANATION OF PLATE 26.—*Diplostephium umbelliferum*. Type specimen. Natural size.

27. *Diplostephium lechleri* (Schultz Bip.) Wedd. Chlor. And. 1: 204. 1857. *Liabum* (*Oligactis*) *lechleri* Schultz Bip. Bonplandia 3: 236. 1855.

TYPE LOCALITY: Near Sachapata, Province of Carabaya, Andes of Peru.

SPECIMEN EXAMINED:

PERU: Near Sachapata, Province of Carabaya, August, 1854, *Lechler* 2517 (type collection; G).

This species is well distinguished by its leaves. These are elliptic or elliptic-lanceolate, acutish, at base acute, 2.6 to 6.5 cm. long, 5 to 15 mm. wide, slightly revolute-margined, rather thin-coriaceous, above brownish-green, shining and glabrous except for the puberulous costa, beneath argenteous-tomentose with a very closely appressed tomentum. The lateral veins are about 13 pairs in the larger leaves, like the costa impressed above, obscure or evident but scarcely prominulous beneath. The involucre is 8 to 9 mm. high, of lanceolate to linear-lanceolate acute phyllaries, the outer appressed-tomentose, the inner dark brown and glabrous, with lacerate-ciliate tips.

28. *Diplostephium rhododendroides* Hieron. Bot. Jahrb. Engler 21: 340. 1895.

TYPE LOCALITY: Laguna Verde, near Azufral de Tuqueres, Colombia. Type collected by Stuebel (no. 429).

Distinguished from *D. lechleri* by its obovate-cuneate leaves (2.5 cm. long, 1 cm. wide), densely reddish or rufescent-tomentellous beneath; from *D. lehmannianum* by its larger heads; and from *D. pleistogynum* by the characters noted in the key.

**29. *Diplostephium pleistogynum* Blake, sp. nov.**

Shrub; stem stoutish, branched, ochraceous-tomentose on the younger parts, glabrescent and denudate below, marked with the decurrent leaf scars; leaves alternate, crowded; blades oblanceolate, the larger 13 to 27 mm. long, 4 to 7 mm. wide, acute, callous-apiculate, narrowed to a sessile base, rather thin-coriaceous, entire, the margin scarcely revolute, above deep green, shining, glabrous or obscurely tomentulose along costa, beneath densely canescent-tomentose, at first ochraceous-tinged; heads about 10 in a dense terminal cyme 3.5 cm. wide; pedicels densely tomentose, 5 to 10 mm. long; disk 8 mm. high, 5 to 7 mm. thick; involucre about 5-seriate, graduated, 7 to 8 mm. high, the outer phyllaries ovate, acute, densely tomentose, the inner lanceolate to linear-lanceolate, acuminate, densely pilose-tomentose except on margin, the extreme tips glabrescent, purplish-tinged; rays 27, pale (when dried), the tube sparsely puberulous, 2 mm. long, the lamina linear, 2-toothed, 4 mm. long; disk flowers about 7, their corollas glandular-puberulous toward base of throat, 4.8 mm. long (tube 1.5 mm., throat slightly broader, 1.5 mm., teeth elongated-triangular, 1.8 mm.); achenes (immature) glandular and hispidulous, 1.3 mm. long; pappus purplish-tinged, the outer bristles few, 0.8 to 1.5 mm. long, the inner 5 to 6 mm. long; style branches very short, rounded, papillose.

Type in the U. S. National Herbarium, no. 531,758, collected on the Páramo de Buena Vista, Huila Group, Central Cordillera, Colombia, altitude 3,000 to 3,600 meters, January, 1906, by H. Pittler.

This species is apparently nearest *D. rhododendroides* Hieron., but is easily distinguished by the difference in the number of the flowers. In *D. rhododendroides* the heads are described as having 25 to 30 flowers, only 6 to 8 of which are ligulate.

**30. *Diplostephium lehmannianum* Hieron. Bot. Jahrb. Engler 21: 340. 1895.**

*Diplostephium schultzei* var. *lehmanniana* Hieron. Bot. Jahrb. Engler 19: 48. 1894.

TYPE LOCALITY: Páramo de Guanacas, Province of Popayán, Colombia, altitude 3,000 to 3,500 meters. Type collected by Lehmann (no. 4893).

*Diplostephium lehmannianum* has leaves 1.5 cm. long, 5 to 6 mm. wide, glabrous above and densely canescent-tomentellous or reddish-tomentose beneath, heads 5 mm. high, minutely glandular achenes, and purplish pappus.

**31. *Diplostephium costaricense* Blake, sp. nov.**

PLATE 27.

Branching shrub; stem stoutish, denudate below, marked with decurrent leaf scars, ochraceous- or cinereous-tomentose, glabrescent or glabrate below; leaves alternate, crowded; blades oblanceolate or linear-oblanceolate, 2.5 to 4 cm. long, 1.5 to 6 mm. wide, acutish, callous-apiculate, narrowed to a sessile base, rather thin-coriaceous, entire, strongly revolute-margined, above cinereous- or ochraceous-tomentulose, in age sometimes glabrescent, beneath densely ochraceous- or cinereous-tomentose, the costa impressed above, evident beneath, the lateral veins concealed or sometimes evident beneath; heads 9 to 13 mm. wide, numerous in dense terminal cymose panicles 3 to 5 cm. wide; pedicels densely tomentose, 3 to 10 mm. long; disk campanulate-hemispheric, 6 to (fruit) 9 mm. high, 7 to (fruit) 12 mm. thick; involucre about 5-seriate, graduated, 5 to 7 mm. high, the phyllaries ovate or lance-ovate (outer) to lanceolate or linear-lanceolate, acutish to acuminate, densely cinereous-tomentose on their exposed por-

tions, indurated, brownish white, with obscure costa, the inner purplish-tinged toward apex; rays about 21, pale (when dried), the tube and base of limb puberulous with glanduliform hairs, the tube 3 to 3.5 mm. long, the lamina linear, 4 mm. long, 0.8 mm. wide; disk flowers about 36, the corollas purplish above, glandular on throat, glandular and sparsely hispid-pilose toward tip of teeth, 5.8 mm. long (tube 2.5 mm., throat 1.5 mm., funnelform-campanulate, teeth 1.8 mm.); achenes of ray and disk similar, densely glandular, 1.5 to 2.5 mm. long; pappus ferruginous-purplish, the outer bristles 0.6 to 1.5 mm. long, the inner 5.5 mm. long; style branches very short, ovate, obtuse, papillose.

Type in the U. S. National Herbarium, no. 939,625, collected on the Cerro de la Muerta, Costa Rica, altitude 3,100 meters, January, 1897, by H. Pittier (no. 10459).

ADDITIONAL SPECIMEN EXAMINED:

COSTA RICA: Humid woods, La Palma, altitude 1,500 meters, December, 1888, Pittier 681(N).

Apparently nearest to the Colombian *D. cochense* Hieron., which is said to have obovate-lanceolate leaves, 2 cm. long and 7 to 8 mm. wide, and 12 to 15-flowered heads. Greenman's record<sup>1</sup> of *Diplostephium schultzi* from Costa Rica, based on Pittier 178, from Mount Irazú, and Pittier 14072, doubtless refers to *D. costaricense*.

EXPLANATION OF PLATE 27.—*Diplostephium costaricense*. Specimen of type collection (U. S. Nat. Herb. no. 471,988).

32. *Diplostephium cochense* Hieron. Bot. Jahrb. Engler 21: 341. 1895.

TYPE LOCALITY: Plain near Río Cocha, Colombia. Type collected by Stuebel (no. 353).

SPECIMEN EXAMINED:

COLOMBIA: Without definite locality, Triana 90(G).

This species is closely related to *D. schultzi*, and may not be distinct. The description of that species is incomplete, and the only material available is very fragmentary. The specimen in the Gray Herbarium that I have referred to *D. cochense* seems to agree better with this species than with *D. schultzi*, but the reference is uncertain.

33. *Diplostephium schultzi* Wedd. Chlor. And. 1: 204. 1857.

*Linochilus jodopappus* Schultz Bip.; Wedd. Chlor. And. 1: 204. 1857, as synonym.

TYPE LOCALITY: Volcán Tolima, Province of Mariquita, Colombia, altitude above 4,000 meters.

SPECIMEN EXAMINED:

COLOMBIA: Volcán Tolima, Linden 901 (type collection; fragments, G).

The description of this species is lacking in details enabling it to be distinguished satisfactorily from *D. cochense* Hieron.

34. *Diplostephium haenkei* (DC.) Wedd. Chlor. And. 1: 203. 1857.

*Simblocline haenkei* DC. Prodr. 5: 297. 1836.

TYPE LOCALITY: Peru. Type collected by Haenke.

Distinguished in its group by its comparatively large heads and leaves. Weddell refers to this species specimens from Cuzco, Peru (Gay), and Cochabamba, Bolivia (*D'Orbigny* 1123). He mentions also a variety with leaves unequally serrate. His description of the species is suggestive of *Diplostephium sejaense*, but in that the leaves are not reticulate beneath. It is probable that his Bolivian record of the species relates to *D. sejaense*.

<sup>1</sup> Proc. Amer. Acad. 40: 36. 1904.

**35. *Diplostephium obtusum* Blake, sp. nov.**

Shrub, branched above; stem stoutish, marked with the persistent leaf scars, ochraceous- or cinereous-tomentose, denudate and glabrescent below, the young branches angled; leaves alternate, rather crowded; petioles tomentulose, 3 to 8 mm. long (including the narrowly margined upper portion); blades obovate or elliptic-obovate, 2 to 3.8 cm. long, 6 to 13 mm. wide, rounded or obtuse, usually emarginate, not apiculate, acutely decurrent into the petiole, rather thin-coriaceous, entire, slightly or strongly revolute-margined, above green, arachnoid-tomentulose, in age glabrescent or glabrate, beneath densely ochraceous-tomentose, the costa and the 9 to 13 pairs of lateral veins (spreading essentially at right angles) impressed above, evident beneath; heads (overmature) rather small, 3 to 6 in a terminal cyme 1.5 to 2.8 cm. wide; pedicels densely tomentose, in fruit 6 to 20 mm. long; involucre about 5-seriate, graduated, 5 mm. high, the outer phyllaries ovate, obtuse, densely cinereous-tomentose at least along midline, the inner ovate-lanceolate to narrowly oblong-lanceolate, obtuse to acute, tomentulose and somewhat ciliolate toward tip or glabrescent, somewhat viscidulous along back, all thick, whitish, without evident costa; heads 18 to 21-flowered; rays not seen; disk corollas puberulous on throat, about 4 mm. long (tube 1.4 to 2.2 mm., throat slightly widened above, 1.5 mm., teeth 0.8 to 1 mm.); ray achenes essentially glabrous, 2 mm. long; disk achenes sparsely hispidulous, 2.8 to 3 mm. long; pappus rufidulous, the outer pappus (bristle-form in the ray, more squamellate in the disk) about 1 mm. long, the inner 3.5 mm. long.

Type in the U. S. National Herbarium, no. 602,219, collected on the Páramo del Jabón, State of Trujillo, Venezuela, altitude 3,000 to 3,200 meters, October 2, 1910, by Alfredo Jahn (no. 24a).

## ADDITIONAL SPECIMEN EXAMINED:

VENEZUELA: Páramo de las Rosas, State of Trujillo, altitude 2,800 meters, October 1, 1910, *Jahn* 24.

Allied to *D. incanum* Hieron., of Peru, which is described as having oblong, obtusish, apiculate leaves 4 to 4.5 cm. long, short outer pappus (only 0.3 mm. long), and much broader inner phyllaries (2.5 to 3 mm. wide).

**36. *Diplostephium floribundum* (Benth.) Wedd. Chlor. And. 1: 205. pl. 36, f. B. 1857.**

*Linochilus floribundus* Benth. Pl. Hartw. 203. 1845.

*Linochilus ochraceus* Schultz Bip.; Wedd. Chlor. And. 1: 205. 1857, as synonym.

*Diplostephium ochroleucum* Klatt, Bot. Jahrb. Engler 8: 37. 1886.

*Aster ochroleucus* Kuntze, Rev. Gen. Pl. 3<sup>2</sup>: 131. 1898.

TYPE LOCALITY: Near Tambo de Gabriel López, Páramo de Guanacas, Province of Popayán, Colombia.

## SPECIMENS EXAMINED:

COLOMBIA: Near Tambo de Gabriel López, Páramo de Guanacas, *Hartweg* 1126 (type collection; Y, photo. N). High swampy plain of Paletará, Province of Cauca, altitude 3,000 meters, May 2, 1884, *Lehmann* 3579 (type of *D. ochroleucum*; G, photo. and fragm. N). Páramo de Buena Vista, Hulla Group, Central Cordillera, Department of Cauca, altitude 3,000 to 3,600 meters, 1906, *Pittier* 1174 (N).

Distinguished from *D. haenkei* by its small heads and leaves, and from *D. obtusum* by its apiculate leaves. Lehmann's specimens differ from the type collection of *D. floribundum* only in having the leaves ochroleucous instead of rufidulous beneath, and this difference is shown by other species to be not of specific importance.

**37. *Diplostephium incanum* Hieron. Bot. Jahrb. Engler 21: 340. 1895.**

TYPE LOCALITY: Near Pishen-uñuna, between Pacasmayo and Moyobamba, altitude 3,200 meters, Peru. Type collected by Stuebel (no. 32a).

This species has oblong leaves (4 to 4.5 cm. long, 13 to 14 mm. wide), obtusish at each end, mucronate-apiculate, cinereous-tomentose above and densely rufescent-cinereous-tomentose beneath.

**38. *Diplostephium ochraceum* (H. B. K.) Nees, Gen. & Sp. Aster. 201. 1832.**

*Aster ochraceus* H. B. K. Nov. Gen. & Sp. 4: 94. 1820.

*Tetramolopium ? ochraceum* DC. Prodr. 5: 262. 1836.

TYPE LOCALITY: "In montibus Quitensibus?"

Distinguished from its allies by the characters indicated in the key.

**39. *Diplostephium denticulatum* Blake, Contr. Gray Herb. n. ser. 53: 25. 1918.**

TYPE LOCALITY: Guadalupe, Colombia, altitude 3,000 meters.

SPECIMENS EXAMINED:

COLOMBIA: Guadalupe, altitude 3,000 meters, July, 1911, *Apollinaire & Arthur* 11 (type collection; N).

Apparently closely related to *D. ochraceum*, but distinguished by its smaller leaves, more numerous rays, and pubescent achenes.

**40. *Diplostephium bicolor* Blake, sp. nov.**

PLATE 28.

"Small tree, 2 to 4 meters high"; stem stout, with conspicuous leaf scars, densely ochraceous-tomentose, in age cinereous-tomentose; branchlets angled; leaves alternate, comparatively remote (3 to 6 mm. apart); petioles densely tomentose, 7 to 12 mm. long; blades obovate or oblong-obovate, 4.5 to 8 cm. long, 1.7 to 3 cm. wide, acutish or obtuse, apiculate, at base acutely cuneate, coriaceous, crenate-dentate or denticulate above the entire base with 6 to 12 pairs of low mucronulate teeth, not revolute-margined, above deep green, at first ochraceous-tomentose, quickly glabrate and deep green, smooth, beneath densely ochraceous-tomentose with soft rather loose hairs, the costa impressed above, evident beneath, the 7 to 12 pairs of lateral veins spreading at an angle of about 60°, impressed or obscure above, evident beneath through the tomentum, the secondaries somewhat foveolate-reticulate above, concealed beneath; heads turbinate-campanulate, becoming hemispheric, 8 mm. wide, several or numerous in terminal and subterminal cymose panicles 2.2 to 3.2 cm. wide; peduncles and pedicels densely ochraceous-tomentose, the pedicels 2 to 10 mm. long; disk 6 to 7 mm. high, 4.5 to (fruit) 6 mm. thick; involucre about 5-seriate, graduated, 5 to 6 mm. high, the phyllaries lance-ovate (outer) to linear-lanceolate, obtuse or acutish, the outer densely pilose-tomentose with ochraceous hairs, sometimes denudate along midline and with greenish central portion and fuscous tip, the inner loosely pilose-tomentose, usually denudate along the viscidulous greenish midline and fuscous tip, loosely ciliate; rays 13, "brown," yellowish or ochre-yellow when dried, the tube puberulous with several-celled hairs, the lamina linear-oblongate, 2.5 mm. long, 0.7 mm. wide, 2 or 3-denticulate; disk flowers 14, their corollas whitish (when dry), puberulous with glanduliform hairs on throat, glandular toward tip of teeth, 4 mm. long (tube 0.5 to 0.8 mm., throat tubular-funnel-form, 2.5 mm., teeth 1 mm.); achenes sparsely glandular, or those of the ray sometimes essentially glabrous, 1.3 to 1.6 mm. long; pappus rufidulous, the outer bristles 1 to 1.8 mm. long, the inner 4 to 4.5 mm. long; style branches of medium length, linear-subulate, hispidulous.

Type in the U. S. National Herbarium, no. 531,286, collected on the headwaters of the Río López, Río Palo Basin, Tierra Adentro, State of Cauca, Colombia, altitude 2,500 to 3,000 meters, January, 1906, by H. Pittier (no. 1084).

This well marked species is related to *D. denticulatum* Blake and *D. ochraceum* (H. B. K.) Nees. The former differs in its pergamentaceous leaves with the secondary veins reticulate beneath, its short peduncles (5 to 7 mm. long in *D. denticulatum*, 18 to 25 mm. in *D. bicolor*), its shorter pedicels (4 mm. long or less), and its subglabrate involucre. The latter is described as having glabrous branches and gray-tomentose branchlets, obsolete denticulate leaves, glabrous phyllaries, and about 5 ray flowers.

EXPLANATION OF PLATE 28.—*Diplostephium bicolor*. Type specimen. Natural size.

#### SPECIES OF UNCERTAIN POSITION.

*DIPLOSTEPHIUM AFFINE* Wedd. Chlor. And. 1: 203. 1857.

TYPE LOCALITY: Cordillera of Carabaya, Peru, altitude 3,000 to 3,500 meters. Type collected by Weddell.

Said to be allied to *D. haenkii*, but with leaves only half as large and yellowish-tomentose beneath, heads loosely corymbose, and outer pappus of subpaleaceous setae. The description is insufficient to place the species in the key.

#### EXCLUDED SPECIES.\*

*DIPLOSTEPHIUM CANUM* A. Gray, Proc. Amer. Acad. 11: 75. 1876.

This species, based on a collection made by Edward Palmer in 1875 on Guadalupe Island, off Baja California, is now known also from several of the Santa Barbara Islands off the coast of southern California. It belongs in the genus *Aplopappus*, and should be known as *Aplopappus canus* (A. Gray) Blake. A discussion of its variations, accompanied by synonymy, will be found in Hall's paper<sup>9</sup> on the Compositae of southern California.

*DIPLOSTEPHIUM CORYMBOSUM* Donn. Sm. Bot. Gaz. 23: 8. 1897.

This species was based on *E. W. Nelson* 3639, from Todos Santos, and *Nelson* 3644, from Hacienda de Chancol, both in the Department of Huehuetanango, Guatemala. In habit and character it is very different from true *Diplostephium*. It is evidently related to *Conyza asperifolia* (Benth.) Benth. & Hook. and *Baccharis mucronata* H. B. K., two species which are perplexingly intermediate between *Baccharis* and *Eschenbachia* (*Conyza*). The precise allocation of the species is left for further investigation.

*DIPLOSTEPHIUM FOLIOSUM* Rusby, Bull. N. Y. Bot. Gard. 8: 128. 1912.

This becomes *Gynoxys foliosa* (Rusby) Blake. The species is well distinguished by its obovate or cuneate-obovate, sparsely denticulate, ternate or sometimes opposite or alternate leaves (densely lutescent-tomentose beneath), its about 16-flowered discoid heads, and its essentially glabrous involucre (7 to 8 mm. high). The type, in the herbarium of the New York Botanical Garden, was collected at Cargadira, Bolivia, altitude 2,440 meters, July 29, 1902, by R. S. Williams (no. 1529).

*DIPLOSTEPHIUM PANICULATUM* Donn. Sm. Bot. Gaz. 23: 8. 1897.

In technical characters this species is closely related to *Diplostephium corymbosum* Donn. Sm., and like it is certainly not a *Diplostephium*. Its disposition must be left for further study. The species was based on *E. W. Nelson* 3629, collected between San Martin and Todos Santos, Department of Huehuetanango, Guatemala.

\* This list includes only species which are not disposed of in the Index Kewensis.

<sup>9</sup> Univ. Calif. Publ. Bot. 3: 65. 1907.



DIPLOSTEPHIUM EMPETRIFOLIUM BLAKE.



DIPLOSTEPHIUM MACROCEPHALUM BLAKE.





DIPLOSTEPHIUM CICATRICOSUM BLAKE.



DIPLOSTEPHIUM OBLANCEOLATUM BLAKE.



DIPLOSTEPHIUM BACCHARIDEUM BLAKE.



DIPLOSTEPHIUM UMBELLIFERUM BLAKE.



DIPLOSTEPHIUM COSTARICENSE BLAKE.



DIPLOSTEPHIUM BICOLOR BLAKE.