

THE COMPOSITAE OF THE GUIANAS, I: HELIANTHEAE
(HELIANTHEAE, TAGETEAE, COREOPSIDEAE)

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ABSTRACT

Approximately 200 species in the family Compositae have been collected in the Guianas (Guyana, Suriname, French Guiana), South America. Members of the tribe Heliantheae *s.l.* collected in the Guianas or expected there are listed, and a key to the genera is provided.

Key Words: floristics, Heliantheae, Compositae, Asteraceae, Guyana, Suriname, French Guiana, Guianas, South America

The *Flora of the Guianas* is a multinational effort by a consortium of the following botanical institutions: Botanischer Garten und Botanisches Museum Berlin-Dahlem, Berlin, Germany; Herbier, Centre O.R.S.T.O.M., Cayenne, French Guiana; Guyana National Herbarium, University of Guyana, Georgetown, Guyana; New York Botanical Garden, Bronx, New York, U.S.A.; National Museum of Suriname, University of Suriname, Paramaribo, Suriname; Museum National d'Histoire Naturelle, Laboratoire de Phanerogamie, Paris, France; Institute of Systematic Botany, Utrecht, The Netherlands (coordinator); U.S. National Herbarium, National Museum of Natural History, Smithsonian Institution, Washington, D.C., U.S.A. The goal of this international group, which began in 1983, is to produce a written account of the vegetation of Guyana, Suriname and French Guiana over a period of 20 years. Over 200 specialists are working on treatments of the seed plants, ferns, algae, bryophytes, and lichens. Several family treatments have been published, including the Chrysobalanaceae (Prance, 1986), Bromeliaceae-Tillandsioideae (Gouda, 1987), Verbenaceae (Jansen-Jacobs, 1988) and Burmanniaceae (Maas and Maas-van de Kamer, 1989) and others are in press, including the Poaceae (Judziewicz, in press) and Melastomataceae (Wurdack, in press).

Treatment of the Compositae is being coordinated out of the U.S. National Herbarium, under the auspices of the Smithsonian's "Biological Diversity of the Guianas Program." A preliminary list of species for the family has been assembled. While compiling this list several things became apparent: first, that there are far fewer composite species in the Guianas than in most other

areas in the neotropics; second, in general, those Compositae in the Guianas are represented by few plant collections; third, many of the species expected in the Guianas have never been collected there, including many common species that have been collected from Venezuela, Trinidad, and/or northern Brazil. Finally, it will be many years before the various Compositae treatments are assembled and ready for publication. In order to facilitate studies of the flora, a list of the species and a key to the genera were deemed a good idea. Because of the size of the family, the list has been divided into tribes and will be published in three papers. The Heliantheae (to include the Heliantheae, Tageteae and Coreopsideae) with 35 genera and ca. 70 species and varieties are covered in this paper. The tribes Anthemideae, Astereae, Chicorieae, Cynareae, Mutisieae and Senecioneae will be included in the second paper and the Vernonieae and Eupatorieae in the third.

I have examined specimens from BRG, CAY, K, NY, P, U, and US (acronyms according to Holmgren et al., 1981). Most of the specimens in BRG, housed at the University of Guyana, were collected by G. S. Jenman, government botanist, Georgetown, Guyana, 1879–1902. The most complete set of Jenman collections, outside of BRG, are housed at NY and K, with less complete sets at a variety of other institutions. However, Jenman also collected many specimens of cultivated plants and most of these are found only at BRG.

Most members of the tribe Heliantheae that are found in the Guianas are weedy and are widespread in the neotropics. However, a few, such as *Ichthyothere granvillei* H. Robinson, *Ambrosia microcephala* DC., *Calea caleoides* (DC.) H. Robinson, and the species of *Reincourtia*, are found primarily in the Guianas. Most genera have one to three native species, the exceptions being *Acmella* (5 taxa), *Bidens* (4), *Calea* (7), and *Oyedaea* (4). The most commonly collected genus in the Heliantheae is *Clibadium*.

ARTIFICIAL KEY TO THE GENERA OF THE HELIANTHEAE OF THE GUIANAS

1. Leaves mostly alternate 2
2. Leaves small and lobed, at least the lower ones deeply so, often finely dissected; heads less than 3 mm across . . 3
3. Synflorescence a spike; pistillate and staminate florets

- in separate heads, pistillate florets without corolla;
achene tightly enclosed in an involucre bract
..... *Ambrosia*
3. Synflorescence a much-branched panicle; pistillate and
staminate florets in same head, pistillate florets with
corolla; achene forming a disarticulating complex with
two infertile disc florets and an involucre bract . . .
..... *Parthenium*
2. Leaves large, sometimes lobed but never finely dissected;
heads more than 3 mm across 4
4. Receptacle with spine-like setae; pappus of 5–10 squa-
mellae; achenes wholly or partially covered with long
stiff white hairs *Gaillardia*
4. Receptacle with bract-like pales; pappus of bristles, awns
or absent; achenes without long stiff white hairs . . 5
5. Ray florets neuter and sterile; heads large, more than
2 cm in diameter 6
6. Peduncle fistulose; inner involucre bracts not
cupping achene of ray floret; receptacle convex;
pappus of 2 awns or absent; disc florets yellow
..... *Tithonia*
6. Peduncle not fistulose; inner involucre bracts
forming partial cup around achene of ray floret;
receptacle distinctly conical; pappus a short
crown or absent; disc florets purplish
..... *Rudbeckia*
5. Ray florets pistillate and fertile, or absent; heads me-
dium to small, less than 2 cm in diameter . . . 7
7. Pappus of 2 awns; mature achenes broadly winged
..... *Verbesina*
7. Pappus of 1–2 rows of numerous capillary bristles;
mature achenes not winged *Neurolaena*
1. Leaves mostly opposite (at least below) 8
8. Involucre bracts uniseriate and equal; leaves with raised
oil glands 9
9. Involucre bracts united into a tube or cup . . . *Tagetes*
9. Involucre bracts free or nearly so 10
10. Heads discoid; leaves petiolate, blades broadly ovate
..... *Porophyllum*
10. Heads radiate; leaves sessile, blades linear or nar-
rowly oblanceolate *Pectis*

8. Involucral bracts not uniseriate and equal; leaves without raised oil glands 11
11. Differentiated peripheral florets neuter and sterile, or absent 12
12. Heads eradiate 13
 13. Pappus absent or apex of achene abruptly contracted, appearing peg-like; florets fewer than 25 per head 14
 14. Apex of achene abruptly contracted, appearing peg-like; florets 2–6 per head; individual florets subtended but not surrounded by receptacular bracts; florets arranged in normal capitula; achene pericarp buff-colored or white *Eleutheranthera*
 14. Pappus absent; florets 8–25 per head; individual florets surrounded by herbaceous bracts resembling an involucre; florets aggregated in dense clusters resembling secondary heads; achene pericarp dark *Lagascea*
 13. Pappus of awns or bristles; numerous florets per head 15
 15. Pappus of retrorsely barbed awns *Bidens pilosa*
 15. Pappus of bristles, broad scales or smooth awns 16
 16. Receptacle clearly conical 17
 17. Shrub; leaves petiolate *Salmea*
 17. Herb; leaves sessile *Spilanthes*
 16. Receptacle convex 18
 18. Florets yellow; achene with pappus of few to many persistent subulate scales *Calea*
 18. Florets white; achene apex with a few easily deciduous bristles *Melanthera*
12. Heads radiate 19

19. Leaves compound, deeply lobed or finely dissected; pales flat 20
20. Achenes elliptic in outline, 2-winged with pappus of 2 glabrate or antrorsely barbed awns *Coreopsis*
20. Achenes linear in outline, wingless, with or without 1–6 retrorsely barbed awns 21
21. Achenes apically contracted with thickened cap; heads large, the involucre more than 2 cm across; pappus absent or rudimentary ... *Dahlia*
21. Achenes without thickened cap; heads smaller, the involucre mostly less than 2 cm across; pappus awns 1–6, well-developed or absent 22
22. Achenes without a beak, the pappus of 1–6 retrorsely barbed awns; filaments glabrous; florets white or yellow *Bidens*
22. Achenes with a long narrow beak, the pappus of 1–3 retrorsely barbed awns or absent; filaments hirsute; florets a variety of colors *Cosmos*
19. Leaves simple, if lobed, not deeply so; pales conduplicate, enfolding or strongly cupping the achene 23
23. Ray florets white; pappus absent; pales of fruiting heads greatly exceeding the length of the achene and sometimes spinose at tip *Montanoa*
23. Ray florets yellow or orange; pappus present; pales never greatly expanded at fruiting and without spinose tip ... 24
24. Achenes dimorphic, the ray florets

- with pappus of 3–4 awns and the disc florets with 2 awns; involucre bracts in several distinctly graded series *Oyedaea*
24. Achenes monomorphic, the pappus of 1–2 deciduous awns, or absent; involucre bracts in 2–3 subequal series 25
25. Woody vine or clambering shrub; pales thickened at apex; leaves opposite; achenes round in cross-section, fleshy at maturity; pappus absent *Wulffia*
25. Annual or perennial herbs; pales not thickened; leaves usually alternate above and opposite below; achenes elliptical in cross-section, indurate; pappus of 2 deciduous awns *Helianthus*
11. Differentiated peripheral florets pistillate and fertile 26
26. Disc florets functionally male; pappus very reduced or absent 27
27. Peripheral florets tubular, not forming well-developed ligules, 4-lobed 28
28. Shrubs; ray florets 3–10; disc florets 8–12; involucre bracts 8–10 *Clibadium*
28. Herbs; ray florets 1; disc florets 8–9; involucre bracts 4–6 *Riencourtia*
27. Peripheral florets forming well-developed ligules, apically rounded to 3-lobed 29
29. Ray florets apically rounded, flared at base into an annular disc; achenes ovoid, notched at base *Unxia*
29. Ray florets apically dentate to emarginate, without a basal annular disc; achenes obovoid, without notch at base 30

- 30. Inner involucre bracts closely enveloping the ray achenes and bearing spines, ridges, or lobes . . . 31
- 31. Achenes cuneate or oblong-fusiform, enclosing bract indurate, covered with long hooked spines; ray florets 5–8; disc florets 3–30, yellow
 *Acanthospermum*
- 31. Achene ovoid, enclosing bracts becoming leathery, without spines; disc florets 3–5, green
 *Milleria*
- 30. Inner involucre bracts not enveloping the ray achenes and without spines, ridges or lobes 32
- 32. Heads sessile; pappus absent; ray corollas with 3–4 lobes; achenes obovoid, never winged, plump, smooth or costate, glabrous
 *Ichthyothere*
- 32. Heads pedicellate; pappus a crown of tissue or collar of short awns; ray corollas emarginate; achenes triquetrous, sometimes winged, flattened, smooth to tuberculate, puberulent
 *Baltimora*
- 26. Disc florets functionally hermaphroditic; pappus of scales, bristles or awns, or pappus absent . .
 33
- 33. Pales flat, hair-like or lacking, sometimes subtending but not enclosing the achene . . 34
- 34. Pales hair-like, fimbriate (easy to miss), not necessarily subtending disc florets
 *Eclipta*
- 34. Pales flat and subtending disc achenes, or lacking 35
- 35. Involucre of 3–4 series of imbricate

- bracts; pappus of many subulate awns; shrubs *Calea*
35. Involucre bi-seriate; pappus of two stiff awns or a few fimbriate scales or ca. 20 lanceolate scales or absent; herbs 36
36. Achenes dimorphic, disc achenes with 2–3 awns and ray achenes with prominent dentate lateral wings; heads inconspicuous, sessile in leaf axils *Synedrella*
36. Achenes monomorphic, without awns or wings; heads conspicuous, in loose or congested clusters *Galinsoga*
33. Pales loosely cupping, enveloping, or partially enclosing the disc achenes 37
37. Involucral bracts with dark band along margin; ray corolla persistent on the achene *Zinnia*
37. Involucral bracts without dark band; ray corolla deciduous from the achene 38
38. Flowering branches covered with obvious, erect, multi-cellular, gland-tipped hairs .. *Sigesbeckia*
38. Flowering branches without obvious gland-tipped hairs 39
39. Pappus of plumose bristles; involucral bracts markedly graduate *Tridax*
39. Pappus of scales or non-plumose bristles, or absent; involucral bracts subequal 40
40. Annual herbs; receptacle clearly conical; achene apex with or without shoulders, the pappus of 1–10 soft bristles or absent *Acmella*

40. Perennial herbs or shrubs;
receptacle flat or slightly
convex; achene apex
contracted, the pappus of
minute fused scales
sometimes with one or
two short awns
..... *Wedelia*

Species List

Compositae: Tribe Heliantheae

Acanthospermum

- A. hispidum* DC.
A. australe (Loefl.) Kuntze

Acmella

- A. brachyglossa* Cass.
A. ciliata (H.B.K.) Cass.
A. oppositifolia (Lam.) R. K. Jansen var. *oppositifolia*
***A. radicans* var. *debilis* (H.B.K.) R. K. Jansen
A. uliginosa (Sw.) Cass.

Ambrosia

- **A. crithmifolia* DC. [Hort!]
***A. cumanensis* H.B.K.
A. microcephala DC.

Baltimora

- B. geminata* (Brandgee) Stuessy

Bidens

- B. alba* (L.) DC. var. *radiata* (Schultz Bip.) Ballard
B. cynapiifolia H.B.K.
B. pilosa L.
B. riparia H.B.K. var. *refracta* (Brandgee) O. E. Schultz

Calea

- ***C. berteriana* DC.
C. caleoides (DC.) H. Robinson
C. lucidivenia Gleason & Blake var. *lucidivenia*
var. *cardonae* Maguire & Wurdack
C. oliverii B. L. Robinson & Greenm.

C. prunifolia H.B.K.

C. solidaginea H.B.K. var. *deltophylla* (Cowan) Pruski & Urbatsch

Clibadium

C. armani Schultz Bip. ex Baker

C. surinamense L.

C. sylvestre (Aubl.) Baill.

Coreopsis

**C. drummondii* Torrey & Gray [Hort!]

Cosmos

**C. bipinnatus* Cav. [Hort!]

C. caudatus H.B.K.

**C. parviflorus* Pers. [Hort!]

C. sulphureus Cav.

Dahlia

**D. sp.* [Hort!]

Eclipta

E. prostrata (L.) L.

Eleutheranthera

E. ruderalis (Sw.) Schultz Bip.

Gaillardia

**G. pulchella* Foug. var. *lorenziana* Voss [Hort!]

Helianthus

H. annuus L. [Hort!]

**H. argyrophyllus* Torrey & Gray [Hort!]

Ichthyothere

I. davidsei H. Robinson

I. granvillei H. Robinson

I. terminalis (Sprague) Blake

Lagascea

***L. mollis* Cav.

Melanthera

**M. nivea* (L.) Small

Milleria

***M. quinqueflora* L.

Montanoa

**M. bipinnatifida* (Kunth) K. Koch [Hort!]

Neuroleana

N. lobata (L.) R. Br.

Oyedaea

O. rusbyi Blake

O. scaberrima (Benth.) Blake

***O. tepuiana* (Badillo) Pruski in ed.

***O. verbesinoides* DC.

Parthenium

P. hysterophorus L.

Pectis

P. elongata H.B.K. var. *elongata*
var. *floribunda* (A. Rich.) Keil

P. humifusa Sw.

***P. linifolia* L.

Porophyllum

P. ruderae (Jacq.) Cass.

Riencourtia

R. glomerata Cass.

R. pittieri Blake

Salmea

***S. scandens* DC.

Sigesbeckia

**S. orientalis* L. [Hort!]

Spilanthes

***S. urens* Jacq.

Synedrella

S. nodiflora (L.) Gaertn.

Tagetes

T. erecta L.

Tithonia

**T. diversifolia* (Hemsl.) A. Gray [Hort!]

Tridax

T. procumbens L.

Unxia

U. camphorata L. f.

Verbesina

***V. alata* L.

V. schomburgkii Schultz Bip.

Wedelia

W. calycina L. C. Rich in Pers. (or *W. caracasana* DC.)

W. fruticosa Jacq.

W. trilobata (L.) Hitchc.

Wulffia

W. baccata (L. f.) Kuntze

W. rubens Alexander

Zinnia

Z. elegans Jacq.

**Z. haageana* Regel. [Hort!]

* = No specimen present at US or NY. Specimen in BRG labeled with this name or a synonym.

** = Unknown from the Guianas but documented from neighboring regions, hence to be expected in the Guianas.

[Hort!] = specimen label contains information that collection was horticultural.

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