

STUDIES IN THE EUPATORIEAE (ASTERACEAE). CXXVII.

ADDITIONS TO THE AMERICAN AND PACIFIC ADENOSTEMMATINAE.

ADENOSTEMMA, GYMNOCORONIS AND SCIADOCEPHALA.

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The tribe Eupatorieae has been divided into four subtribes by B. L. Robinson (1913). The groups were largely artificial and have only nomenclatural significance at present. The Adenostemmatinae, however, represented, with the exclusion of the genus Hartwrightia, a natural group and one of the most distinctive elements in the tribe. No taxonomic study of the American or Pacific members of the group seems to have been undertaken in this Century and the present work is an effort to correct the various errors and omissions in the established generic and specific concepts.

The subtribe Adenostemmatinae has been rather accurately circumscribed in the past in spite of the lack of any one obvious unifying character. Most members of the group have the distinctive stout gland-tipped arms of the pappus but these are lacking in Gymnocoronis. The latter genus and Adenostemma share the usually greatly expanded soft style branches but these are lacking in Sciadocephala. Distinctive features of the subtribe that are common to all genera but are less obvious are in the structure of the receptacle. This is shown partially in the broad and rather indefinite bases of the involucre bracts. More definite is the persistence of soft tissue between the areolae allowing the latter to shift in position. In other Eupatorieae the cells of the ridges between the areolae are sclerified and sometimes highly ornamented.

The three genera of the Adenostemmatinae can be distinguished by the following key.

1. Pappus lacking; style glabrous . . . . . Gymnocoronis
1. Pappus with 2-5 distinct gland-tipped knobs . . . . . 2
2. Anther appendages longer than wide; style glabrous, with firm narrow branches . . . . . Sciadocephala
2. Anther appendages not as long as wide; style often with numerous hairs on shaft, with soft usually expanded branches . . . . . Adenostemma

The generic concepts are reenforced by additional characters. Adenostemma has anther collars more swollen in the lower part with few to many distinct subquadrate basal cells, while the other genera have only oblong basal cells with transverse annulations. Gymnocoronis has five ribbed achenes where the ribs expand more at maturity. Sciadocephala has the pappus knobs proportionately longer with the glandular tips short and sharply demarcated basally. In Adenostemma the glandular surfaces extend downward on the outer side of the knobs. Gymnocoronis has the anther appendages mostly recessed between the anther sacs and very emarginate at the tip while Adenostemma has appendages simply truncate. Some Old World species of Adenostemma may have less swollen anther collars or glabrous styles but do not otherwise depart from the overall generic pattern.

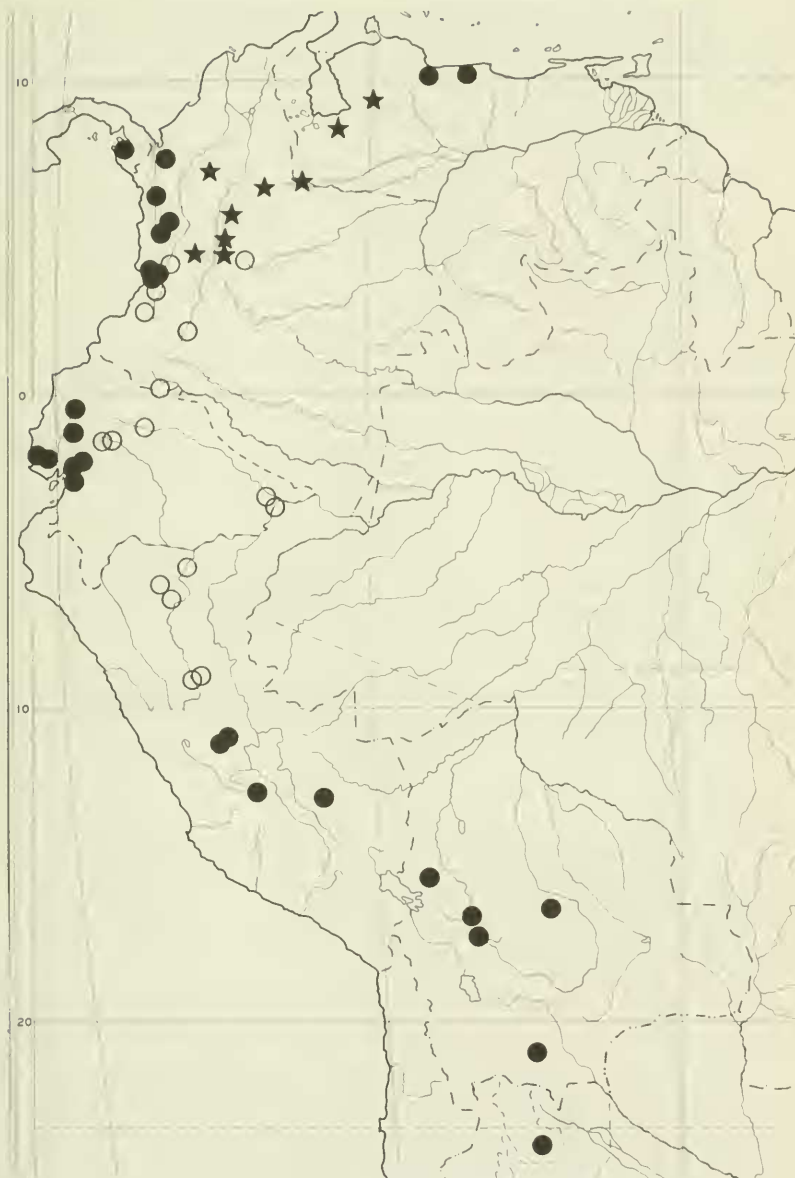
The evolution of the Adenostemmatinae most likely involves an ancestral form closer to Sciadocephala which has the firmer less expanded style branches and the longer ovate anther appendages. Such forms are the ones common in the rest of the Eupatorieae. Gymnocoronis seems less specialized than Adenostemma, but has more modified styles and anthers than Sciadocephala. Gymnocoronis retains traces of the pappus knobs in one species, G. nutans, where the knobs are very vestigial and have no specialized glandular tips. The genus Adenostemma has the greatest concentration of specialized features, including the setiferous styles and reduced anther appendages as well as the reduction to three angles or knobs on the achenes in most species.

Each of the genera of the subtribe has proven to need considerable revision.

#### ADENOSTEMMA

The genus as circumscribed here excludes two species, A. nutans is a Gymnocoronis and A. pakaraimae is a Sciadocephala. The remaining element of the genus Adenostemma still retains the great majority of the species in the subtribe and includes all the species that have reached the Eastern Hemisphere.

Although Sciadocephala also has gland-tipped pappus knobs, it is Adenostemma in which these structures seem to have functioned most successfully. The glandular part of the knobs produces a very sticky substance when mature and some achenes are still sticky after many years in the herbarium. It seems obvious that animals are common agents in the distribution of these achenes and birds have probably introduced the genus into the Eastern Hemisphere more than once. The genus is the most highly speciated member of the tribe in the African and Asiatic region. These Old World species are not well known though a recent study of those from Ceylon (Grierson, 1972) is very helpful. The distribution by animals seems to be successful only within limits and long range dispersal over larger areas of water is rare enough that most of the results have achieved species distinction.



Distribution of three Andean species of *Adenostemma*, dots *A. platyphyllum*, circles *A. fosbergii*, stars *A. cuatrecasii*.

The reinterpretation of A. lavenia (L.) O.Kuntze shows that its elements are not conspecific as often assumed, and not even the West Indian and South American elements are the same. The South American A. brasilianum has also been interpreted too broadly. The species occurs naturally only in eastern South America. West Indian material under the latter name is A. berterii DC. and a single specimen from Nicaragua (Flint 1868 US) probably represents a recent introduction.

The direct effects of animals seem evident in the distributions of three species of Adenostemma in western South America. One of these species, A. platyphyllum Cass., ranges from the coast of Venezuela and Colombia with one station in Panama southward in Ecuador west of the Andes. The species reaches intermontane valleys in central Peru and occurs east of the Andes in Bolivia and northernmost Argentina. The species occurs mostly at low elevations. The second species, A. fosbergii, occurs on the average at slightly higher elevations beginning in the north in the Western Cordillera and first intermontane valley of the Cauca and Valle regions of Colombia. The species occurs in the second intermontane valley slightly farther south in Dept. Huila in Colombia. Elsewhere in Colombia and in Ecuador and northern Peru the species occurs only on the eastern slope of the Andes. The third species, A. cuatrecasasii, occurs at distinctly higher elevations in central and northern Colombia and in adjacent Venezuela. It seems remarkable that the three species would have such closely adjacent and extensive rather parallel distributions without any actual overlap. Two of the species have extended their ranges quite far north and south, each crossing the main ranges of the Andes at different places. It seems likely that there are distinctive bird migration patterns that would explain these distributions.

The distribution of Adenostemma in Central America seems unexpectedly limited. There is one species known from Guatemala, A. hirtiflorum Benth., which is quite distinctive in many features including the characteristic five knobs of the pappus. There are two species in the Greater Antilles, A. berterii DC., an erect growing plant and A. verbesina (L.) O.Kuntze, a mostly creeping plant. There are seven species in South America, including three that are undescribed. The seven species can be distinguished by the following key.

1. Leaves mostly elliptical, entire to subserrulate . . . . .  
A. suffruticosum
1. Leaves ovate or triangular, usually distinctly serrate or  
 crenate . . . . . 2
2. Plants mostly creeping, erect only near tips . A. verbesina
2. Plants mostly erect, procumbent only at base . . . . . 3

3. Mature corollas not or scarcely exerted beyond the long involucre bracts; plants of higher elevations, above 1000 m in Colombia and Venezuela . . . . A. cuatrecasatii
3. Mature corollas distinctly exerted beyond involucre bracts; plants mostly of lower elevations . . . . . 4
4. Leaves triangular with angulate lateral margins; plants of eastern South America . . . . . 5
4. Leaves ovate without angulate lateral margins; plants of western South America to Bolivia and northern Argentina . . . . . 6
5. Leaf blades longer than wide; involucre with prominent scarious margins; limb of corolla short and mostly hirsute . . . . . A. involucreatum
5. Leaf blades about as wide as long; involucre bracts with only slight scarious margins; limb of corolla cylindrical and glabrous in lower part . . . . . A. brasilianum
6. Corolla limb very short and densely hirsute; style branches not broadened distally . . . . . A. fosbergii
6. Corolla limb cylindrical and glabrous in lower part; style branches greatly enlarged distally . . . . A. platyphyllum

Adenostemma verbesina (L.) O.Kuntze is rather widely distributed in South America, A. suffruticosum Gardn. is known only from eastern Brasil. The following three species from South America and one species from Fiji are previously undescribed.

Adenostemma cuatrecasatii R.M.King & H.Robinson, sp. nov.

Plantae erectae aliquantum grosse herbaceae usque ad 2 m altae annuae vel subperennes. Folia opposita, petiolis 2-11 cm longis superne sensim distincte alatis sub medio teretibus; laminae late ovatae vel subtriangulares usque ad 18 cm longae et 16 cm latae base rotundatae vel truncatae vel subcordatae abrupte late decurrentes margine valde serratae vel sunintegrae ad apicem obtuse acutae supra et subtus persparsim puberulae prope basem valde trinervatae, nervis secundariis sensim valde ascendentibus. Inflorescentiae laxae profuse cymosae, pedicellis 5-18 mm longis dense glandulo-puberulis. Capitula 5-7 mm alta 5-10 mm lata; squamae involucri ca. 15-25 eximbricatae irregulariter biseriatae anguste oblongae subacutae vix vel non scariosae 4-5 mm longae base breviter connatae extus saepe glanduliferae. Flores ca. 15-55. Corollae albae 2.5-3.5 mm longae anguste infundibulares, tubis vix angustioribus, limbis elongatis extus pauca

glanduliferis, lobis base paucè vel dense setiferis; filamenta antherarum in parte superiore base dilatata 150-200  $\mu$  longis, cellulis plerumque subquadratis; thecae ca. 1 mm longae; scapi stylorum distincte setiferi, appendicibus grosse elongate clavatis usque ad 4 mm exsertis. Achaenia ca. 2.0-2.5 mm longa leniter curvata subtrigona plerumque dense glandulo-tuberculata; carpodia distincte obliqua; clavulae pappi plerumque 3 ca. 0.5-0.7 mm longae. Grana pollinis 18-20  $\mu$  diam.

Type: COLOMBIA: Cundinamarca: entre El Salto y El Colegio, 1680 m, March 10, 1940, Cuatrecasas 8237 (Holotype US). Paratypes COLOMBIA: Antioquia: Rio Anorí between Cruces and Madreseca, 800 m, Core 679 (US); Boyaca: extreme western part, region of Mt. Chapon, 3000 ft., Lawrance 178 (US); Cundinamarca: La Vega, 1300 m, Arbeláez & Cuatrecasas 5352 (US); Sasaima, vereda San Bernardo; La Mariá entre las quebradas La Mariá y La Victoria, 1850-1940 m, García-Barriga 12600 (US); Norte de Santander: Región de Sarare, entre el Alto del Loro y el Alto de Santa Inés, 1800-2200 m, Cuatrecasas, Schultes & E. Smith 12487 (US); Santander: Jordan, 10 k sse Landazuri, ca. 2300 m, Ewan 15671 (US); Tolima: Quindío, Triana 1160 (US); VENEZUELA: Mérida: Tabay 1800-2000 m, Gehriger 365 (US); Trujillo: entre Boconó y El Batatal, 1800 m, Steyermark & Rabe 97367 (US).

The new species is most closely related to A. platyphyllum Cass. but it can be distinguished rather easily by its somewhat larger size, by its more cordate or subcordate main leaves and by the higher elevations where it occurs. The most distinctive difference of the new species is the length of the involucre bracts which are pointed and mostly reach the level of the corolla lobes. The bracts of A. platyphyllum are particularly short and rounded at the tip in contrast. The new species has some variation with the Venezuelan specimens tending to have larger heads with more densely glanduliferous involucre bracts and less serrate leaf margins.

Adenostemma fosbergii R.M.King & H.Robinson, sp. nov.

Plantae erectae herbaceae usque ad 1 m altae subperennes. Folia opposita, petiolis 1-7 cm longis superne sensim alatis sub medio teretibus; laminae late ovatae non angulatae usque ad 13 cm longae et 10 cm latae base rotundatae abrupte late decurrentes margine subintegrae vel subcrenatae ad apicem breviter acutae supra et subtus sparsim minute puberulae prope basem valde trinervatae, nervis secundariis valde ascendentibus. Inflorescentiae laxae cymosae, pedicellis 7-21 mm longis dense minute puberulis non glanduliferis. Capitula ca. 3.5 mm alta ca. 4.0-4.5 mm lata; squamae involucri ca. 15-20 eximbricatae plerumque biseriatae oblongae vel ovoides ad apicem rotundatae anguste scariosae ca. 2.5 mm longae base breviter connatae extus subglabrae. Flores ca. 15-20. Corollae albae 1.3-1.5 mm longae, tubis distinctis ca. 0.5 mm longis paucè glanduliferis, limbis brevibus late campanulatis ca. 0.5 mm

longis extus dense setiferis; lobis 4-5; filamenta antherarum in parte superiore base dilatata ca. 150  $\mu$  longis, cellulis plerumque subquadratis; thecae ca. 0.5 mm longae, appendicibus subtriangularibus ca. 75  $\mu$  longis et 125  $\mu$  latis; scapi stylorum distincte setiferi, appendicibus late linearibus usque ad 1 mm exsertis. Achaenia ca. 2 mm longa leniter curvata subtrigona plerumque dense glandulo-tuberculata; carpodia aliquantum obliqua; clavulae pappi plerumque 3 ca. 0.5 mm longae. Grana pollinis ca. 18  $\mu$  diam.

Type: COLOMBIA: Huila: 12 km ese of Garzón below Finca la Estrella on Quebrada Cucaracha, one of headwaters of Quebrada Damas, 2000 m, Fosberg 19918 (Holotype US). Paratypes COLOMBIA: Cauca: Micay Valley, "La Gallera", 1400-1500 m, Killip 7679 (US); Cundinamarca: "Susumuco" southeast of Quetame, 1200-1400 m, Pennell 1737 (US); Putumayo: rio San Miquel, en el afluyente izquierda Quebrada de la Hormiga, 290 m, Cuatrecasas 11089 (US); Valle: hoya de Río Anchicayá, Quebrada del Dunubio, 300-350 m, Cuatrecasas 13721 (US); Valle: Cauca Valley, east of Zarzal, Quebrada Nueva to Cuchilla, 1100-1300 m, Pennell, Killip & Hazen 8487 (US); ECUADOR: Napo: at Río Suno, 3 km w of Río Napo, 400 m, Holm-Nielsen & Jeppesen 908 (AAU); Pastaza, vicinity of Puyo, 750-1000 m, Skutch 4546 (US); Tungurahua: Valley of Pastaza River, between Baños and Cashurco, 1300-1800 m, Hitchcock 21794 (US); PERU: Huanuco: Tingo María, 625-1100 m, Allard 20609 (US); Loreto: Divisoria, 59 km from Tingo María on highway to Pucallpa, ca. 1600 m, Allard 21804 (US); Loreto: Gamitanacocho, Río Mazán, 100-125 m, Schunke 262 (US); Loreto: lower Río Huallaga, 155-210 m, Williams 5164 (US); Loreto: Mishuyacu, near Iquitos, 100 m, Klug 222 (US); San Martín: Prov. de Lamas Trocha, Desquite-Cuñumbuqui, camino Sisa-Tarapoto, 1000-1200 m, Ferreira 7991 (US); Zepelacio, near Moyobamba, 1100-1200 m, Klug 3379 (US).

Adenostemma fosbergii is distributed along the eastern side of the Andes in Peru and Ecuador and crosses over to the Western Cordillera in Colombia. The species is very distinct by the short and densely hirsute corolla limbs and by the rather slender style branches. The heads are generally smaller than those of A. platyphyllum which is vegetatively similar. The new species also seems to occur at slightly higher elevations on the average than the related species. The short corolla and small style branches are most like A. viscosum Forst. of the Indian and Pacific Oceans and A. perrottetii DC. of Africa. Both the latter species differ primarily by the more pubescent leaves and involucre and by the lack of hairs on the style.

Adenostemma involucratum R.M.King & H.Robinson, sp. nov.

Plantae erectae herbaceae usque ad 1 m altae subperennes. Folia opposita, petiolis usque ad 10 cm longis superne sensim alatis sub medio teretibus; laminae ovato-triangulares vel hastatae usque ad 14 cm longae et 12 cm latae distincte longiores quam latiores base late cuneatae vel truncatae et abrupte longe

decurentes margine subintegrae vel partim argute dentatae ad apicem argute acutae vel breviter acuminatae supra et subtus sparsim minute puberulae prope basem valde trinervatae, nervis secundariis valde ascendentibus. Inflorescentiae laxae profuse cymosae, pedicellis 5-26 mm longis dense minute puberulis non glandiferis. Capitula 4-5 mm alta et 5-7 mm lata; squamae involucri ca. 15-20 eximbricatae extus subglabrae aliquantum regulariter biseriatae exteriores anguste oblongae ca. 2.0-3.0 mm longae interiores late obovatae ca. 2.5-3.5 mm longae ad apicem late rotundatae late scariosae. Flores ca. 15-25. Corollae albae 2.0-2.3 mm longae, tubis distinctis ca. 0.6 mm longis, limbis anguste campanulatis ca. 1 mm longis extus pauca glanduliferis; lobis 5 extus pauca setiferis; filamenta antherarum in parte superiore base dilatata ca. 100  $\mu$  longis, cellulis plerumque subquadratis; thecae ca. 1 mm longae, appendicibus truncatis ca. 80  $\mu$  longis et 300  $\mu$  latis; scapi stylorum distincte setiferi, appendicibus grosse elongate clavatis usque ad 3.0 mm exsertis. Achaenia ca. 2.0-2.5 mm longa leniter curvata subtrigona glandulifera vix tuberculata; carpodia distincte obliqua; clavulae pappi plerumque 3 ca. 0.5 mm longae. Grana pollinis ca. 23  $\mu$  diam.

Type: BRASIL: São Paulo: Ubatuba, Est. Exp., March 14, 1939, Killip 3498 (Holotype US). Paratypes: BRASIL: without precise locality, Gardner (US 1066363); Minas Gerais: Viçosa, State Agricultural School, Irwin 2700 (US); Parana: Morretes, entre Cabrestante e Pilão de Pedra, Hatschbach 14059 (US); Rio de Janeiro: Corcovado, Brook Trail between Sylvestre and Paineiras, 200-469 m, L.B. Smith & Vieira 1377 (US); Parque Nacional de Itatiaia, Barth 1117 (US); Itatiaia, Porto 2861 (US); Porte R. Doce, Esp. Santo - Matas do R. São Gabriel, Vieira 33 (US); Santa Catarina: Mina Velha, Garuva, S. Francisco do Sul, 10 m, Reitz & Klein 6259 (US).

The new species has triangular leaves similar to A. brasilianum (Pers.) Cass. which occurs in the same areas of eastern South America. The distinctions of the species include the leaf blades being longer than wide and more broadly cuneate at base, the involucre being more regular in its structure with more scarious margins on the inner bracts, the pedicels being essentially without glands, and the limbs of the corollas being shorter and more hirsute. The structure of the involucre is the most patterned that has been seen in the genus but the regularity is often broken by two or more scarious inner bracts or more rarely two narrower outer bracts occurring together.

Material of this species (Irwin 2700) is the source of a chromosome report of  $n = 5$ .

Adenostemma vitiense H. Robinson, sp. nov.

Plantae erectae herbaceae usque ad 1-2 m altae annuae vel subperennes. Folia opposita, petiolis 2-5 cm longis superne sensim distincte alatis sub medio teretibus; laminae late ovatae



usque ad 14 cm longae et 9.5 cm latae base late rotundatae abrupte decurrentes margine serratae ad apicem argute acutae supra perpaucis minute piliferae subtus distincte sparse minute glandulo-punctatae prope basem valde trinervatae, nervis secundariis sensim valde ascendentibus. Inflorescentiae laxae corymboso-paniculatae, pedicellis 6-25 mm longis hirtellis. Capitula 6-7 mm alta 8-10 mm lata; squamae involucri ca. 16-20 eximbricatae irregulariter biseriatae oblongae vel obovatae subacutae margine et apice plerumque anguste vel distincte scariosae 4.0-4.5 mm longae base breviter connatae extus distincte sparse puberulae. Flores ca. 20-30. Corollae albae ca. 2 mm longae anguste infundibulares extus multo glanduliferae, tubis subdistinctis usque ad 1 mm longis, limbis anguste infundibularibus extus hirsutis, lobis latioribus quam longioribus; filamenta antherarum in parte superiore base aliquantum dilatata 300-350  $\mu$  longa, cellulis plerumque subquadratis; thecae ca. 0.7 mm longae, appendicibus ca. 100  $\mu$  longis 250  $\mu$  latis; scapi stylorum glabri, appendicibus distincte leniter clavatis usque ad 2-3 mm exsertis. Achaenia ca. 3 mm longa leniter curvata biconvexa vel trigona sparse glandulifera non tuberculata; carpodia distincte obliqua; clavulae pappi 2-3 ca. 0.7 mm longae. Grana pollinis 23-25  $\mu$  diam.

Type: FIJI: Viti Levu: Mba (formerly Tholo North), western slopes of Mt. Nanggara-nambuluta (Lomalangi), east of Nandarivatu, 1000-1100 m, A.C. Smith 4799 Holotype US). Paratype: FIJI: Nania, Wilkes s.n. (US).

Adenostemma vitiense seems unique in the glandular punctate lower surfaces of the leaves and it is one of the few species with nontuberculate achenes. The other species that has been seen from Fiji is A. viscosum Forst., described from the Society Islands and distributed from Hawaii to Ceylon. This latter species has short narrow style branches and a very short corolla limb in addition to tuberculate achenes. The Forster species seems to be the same as A. parvifolium (Bl.) DC. originally described from Java. A third species, A. lanceolatum Miq., occurring in the Pacific and perhaps occurring in Fiji, has long exserted style branches, usually less sharply pointed leaves and tuberculate achenes. Glabrous styles are apparently characteristic of all the Pacific species of Adenostemma.

#### GYMNOCORONIS

The species of the genus are characteristically marsh plants occurring in two widely separated areas of Latin America.

The genus is represented in South America by a single species, G. spilanthis (D. Don.) DC. Blake (1923) thought it necessary to revert to the later name G. attenuata DC. for this species, but what Blake interpreted as a homonym for G. spilanthis should be treated simply as a miscitation of author.

The species is known primarily from Paraguay, Uruguay and adjacent Argentina with one collection from Bolivia. A still more northward extension of the natural range is now known from extreme western Brazil: Terr. do Acre: Sumpfpflanze am Ufer des Rio Mamoré bei Guajaramirim, Jan. 1965, St. Vogel 369 (US). A collection from the coast of North Carolina dating from 1888 seems to represent a short-lived introduction.

The genus Gymnocoronis in Mexico seems more complex and the number of collections is less than adequate. The present study has arrived at only limited conclusions that should be carefully rechecked against future collections. The specimens include one with densely glanduliferous corollas. All other specimens have corollas with few or no glands. The strictly alternate branches of the inflorescence are an additional but perhaps unreliable distinction of the more glanduliferous material described below as a new species. Among the less distinctive members of the genus in Mexico the oldest name is G. latifolia Hook. & Arn., described originally from Jalisco. On the basis of a Blake photograph of the type and an additional specimen from the southern coast of Chiapas the species seems to have rather narrow bases on most of its leaves and seems to be restricted to the Pacific Coast of Mexico. The remaining specimens from along the Gulf Coast of Mexico with opposite basal branches of the inflorescence and generally broader leaf bases include G. nutans, originally described as an Adenostemma, and perhaps a second species, G. sessilis Blake. The Blake species was separated from G. latifolia by the obviously sessile leaves but the relationship to the previously described Adenostemma nutans was not recognized. The latter species had been placed in Adenostemma because of the vestigial knobs at the top of the Achene. The knobs are so vestigial that they are probably of more significance for phyletic interpretation than for taxonomy. Still, such knobs have not yet been seen in any other specimens and the involucre bracts of the type specimen are more broadly rounded than the bracts of any other specimen. It would be premature to reduce G. sessilis to synonymy, but a new combination is required for G. nutans in any case.

Gymnocoronis nutans (Greenman) R.M.King & H.Robinson, comb. nov.  
Adenostemma nutans Greenman, Field Mus. Bot. 2: 344. 1912.

Gymnocoronis matudae R.M.King & H.Robinson, sp. nov.

Plantae erectae herbaceae minimum 40 cm altae non ramosae. Caules castanei hexagoni striati glabri. Folia plerumque opposita sessilia oblonge elliptico-lanceolata usque ad 13 cm longa et 4 cm lata base cuneata et vix amplexicaulia margine crenulato-serrulata apice anguste acuta supra et subtus glabra, nervis secundariis paucis subpinnatis ascendentibus. Inflorescentiae corymboso-paniculatae, ramis alternatis glabris vel pauca minute glanduliferis, pedicellis 7-13 mm longis saepe

cernuis. Capitula 4-6 mm alta et 4-6 mm lata; squamae involucri ca. 20 eximbricatae plerumque biseriatae anguste oblongae 3.5-4.5 mm longae apice obtusae vel anguste rotundatae interdum lanceolatae non scariosae extus sparse glanduliferae. Flores ca. 50. Corollae ca. 3.2 mm longae extus multo glanduliferae, tubis basilaribus brevibus ca. 0.7 mm longis, limbis cylindricis, lobis 5 triangularibus 300-400 μ longis ca. 400 μ latis; filamenta antherarum in parte superiore crassa ca. 350-400 μ longis; thecae ca. 1 mm longae; rami stylorum valde incrassati. Achaenia ca. 3 mm longa 5-costata intercostate dense glandulifera; pappus nullus. Grana pollinis 18-20 μ diam.

Type: MEXICO: Campeche: Palizada, July 25-28, 1939, Matuda 3844 (Holotype US).

The species is distinguished by the densely glanduliferous corollas and the strictly alternate branches of the inflorescence.

SCIADOCEPHALA

The genus is known only from northern South America and has previously had only one recognized species. The original description by Mattfeld (1938) and another collection from near the type locality in coastal Ecuador have provided a clear concept of the type species. It has been rather surprising to find that a more recent collection from the interior of Colombia that has been placed under the name is a totally distinct species. This second species is of further interest because of the form of its nectary which seems unique in the family. A final surprise is the existence of a third species from British Guiana which has been described as an Adenostemma. At present the three species are separated in the three main isolated areas of moist tropical low lands in northern South America, the Pacific Coastal, the Amazonian, and the Guianian. The three species can be distinguished by the following key.

- 1. Plants creeping; leaves broadly ovate with rounded to truncate bases . . . . . S. pakaraimae
- 1. Plants erect; leaves elliptical to ovate-lanceolate with cuneate bases . . . . . 2
  - 2. Leaves entire, with secondary veins pinnate in 4-5 pairs . . . . . S. amazonica
  - 2. Leaves serrate-dentate, with few secondary veins, lower veins prominently trinervate . . . S. schultze-rhnhofiae

The three species of Sciadocephala are as follows:

Sciadocephala schultze-rhnhofiae Mattf., Notizbl. Bot. Gart.  
Berlin 14: 42. 1938.

Sciadocephala pakaraimae (Maguire & Wurdack) R.M.King & H.Robinson, comb. nov. Adenostemma pakaraimae Maguire & Wurdack, Mem. New York Bot. Gard. 9: 366. 1957.

Sciadocephala amazonica R.M.King & H.Robinson, sp. nov.

Plantae erectae herbaceae usque ad 40 cm altae perennes. Caulis base decumbentes superne evanescentiter breviter rufohirsuti anguste fistulosi. Folia opposita, petiolis 5-15 mm longis; laminae ellipticae vel anguste obovatae 5-9 cm longae et 2-4 cm latae base cuneatae margine integrae ad apicem obtusae vel breviter acutae supra et subtus sparsim minute puberulae, nervis pinnatis, paribus secundariis ca. 5 valde ascendentibus. Inflorescentiae subcymosae pauce capitatae, pedicellis ca. 1-2 cm longis puberulis. Capitula ca. 1 cm alta ca. 3-4 mm lata; squamae involucri ca. 10 plerumque uniseriatae plerumque 5-7 mm longae lineari-lanceolatae extus sparsim puberulae ad apicem anguste obtusae base vix connatae. Flores ca. 9. Corollae albae 6-7 mm longae anguste infundibulares extus sparsim puberulae, tubis indistinctis, lobis triangularibus ca. 0.8 mm longis et 0.5 mm latis; filamenta antherarum in parte superiore ca. 0.6 mm longa; thecae ca. 1.8 mm longae, appendicibus ovatis ca. 300  $\mu$  longis et 250  $\mu$  latis; nectaria ad apicem setifera; styli glabri, appendicibus linearibus. Achaenia 6-8 mm longa sparsim puberula; carpodia leniter asymmetrica; clavulae pappi 4-6 plerumque 3 ca. 3.5 mm longae, partibus glanduliferis discretis ca. 0.3 mm longis. Grana pollinis argute spinosa ca. 30  $\mu$  diam.

Type: COLOMBIA: Amazonas: Loretoyacu River, 100 m, Oct. 1945, Schultes 6674 (Holotype US).

The new species differs from S. schultze-rhnhofiae Mattf. most noticeably in the leaves which are entire with many pairs of secondary veins pinnately arranged. In the Mattfeld species the leaves are prominently serrate and there are only two remote pairs of secondaries with the lower pair forming a trinervate base of the lamina. The new species is also distinct in the feature that seems unique in the entire family, the presence of hairs on the tip of the nectary. Other Asteraceae have nectaries of various shapes and with variously positioned stomata but none have previously been seen with any kind of pubescence.

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*Adenostemma cuatrecasatii* R.M.King & H.Robinson, Holotype,  
United States National Herbarium. Photos by Victor E. Krantz,  
Staff Photographer, National Museum of Natural History.



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Adenostemma fosbergii R.M.King & H.Robinson, Holotype, United States National Herbarium.



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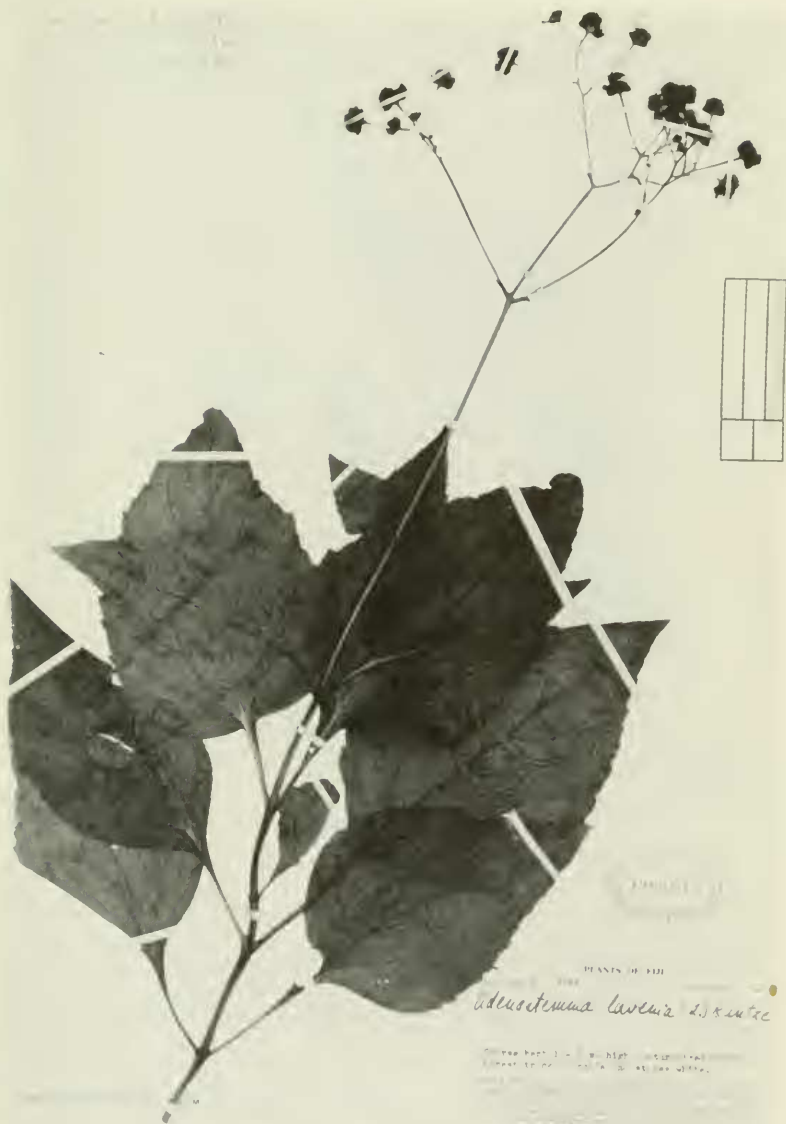
FAM  
GEN  
ESP  
VAN  
CHR

*Adenostemma*  
(Pres. King)

Collected by  
Det. by  
Examined by

*Adenostemma involucreatum* R.M.King & H.Robinson, Holotype, United States National Herbarium.





Adenostemma vitense H. Robinson, Holotype, United States National Herbarium.



*Gymnocoronis matudae*

21340

FLORA MEXICANA  
Matuda Herbarium

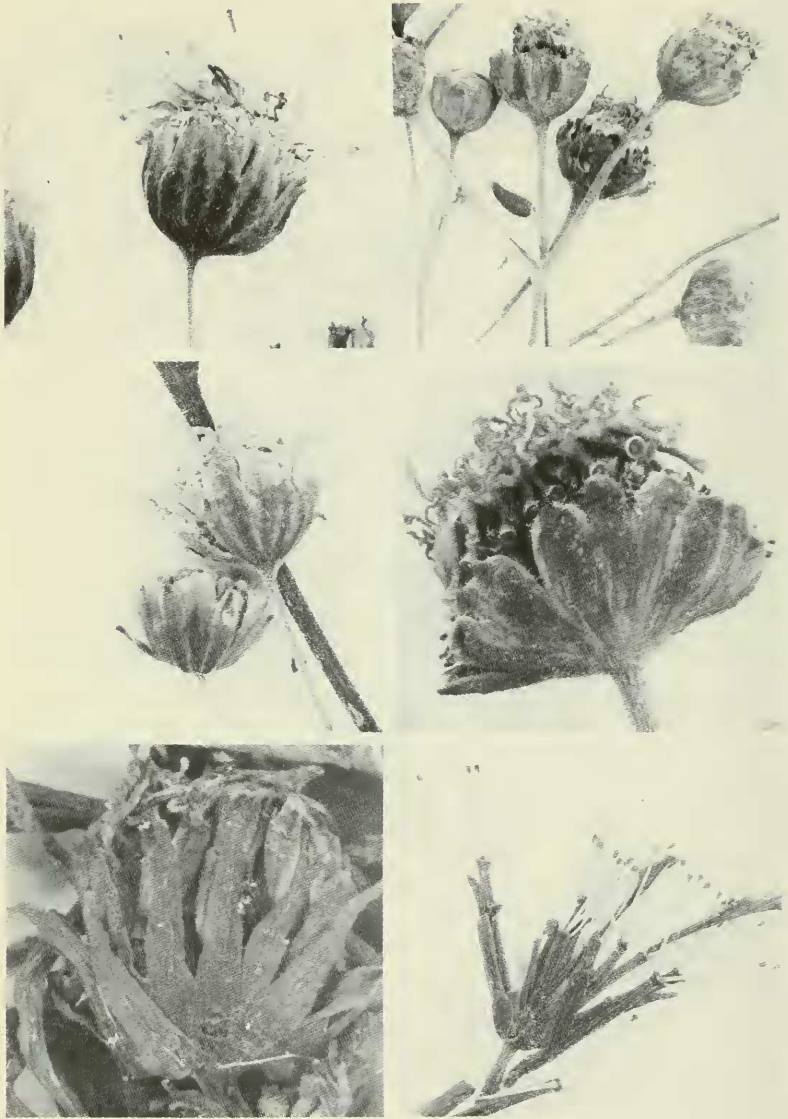
*Gymnocoronis matudae* R.M. King & H. Robinson

*Gymnocoronis matudae* R.M. King & H. Robinson, Holotype, United States National Herbarium.



PLANTAL COLOMBIANAI  
AMAZONIA

*Sciadocephala amazonica* R.M.King & H.Robinson, Holotype,  
United States National Herbarium.



Enlargements of heads of Adenostemmatinae. Top left; Adenostemma cuatrecasatii. Top right; A. fosbergii. Middle left; A. involucratum. Middle right; A. vitiense. Bottom left; Gymnocoronis matudae. Bottom right; Sciadocephala amazonica.