

STUDIES IN THE EUPATORIEAE (ASTERACEAE). CLXVIII.

ADDITIONS TO THE GENUS AGERATINA.

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The genus Ageratina was ressurected by the authors in 1970 to include nearly 200 species including many that had been among the most poorly understood taxonomically in the older broad concept of Eupatorium. Since that time a number of species have been described by other authors (Adams, 1971; McVaugh, 1972 and Turner, 1977) and these have been transferred and numerous others described in various papers in this series (King & Robinson, 1972, 1974, 1975, 1977a, 1977b). During the last few years the related group of genera including Ageratina has become clear. Recent efforts to identify material from various collectors and to prepare for floristic treatments has resulted in the recognition of a number of new species. The present paper is intended to establish the group of genera including Ageratina as a new subtribe, to describe two new subgenera within Ageratina, to report new synonymy and range extentions and to describe 12 new species.

Oxylobinae R. M. King & H. Robinson, subtribus nov.

Plantae herbaceae perennes vel frutescentes; folia opposita; squamae involucris eximbricatae vel leniter subimbricatae; corollae in tubis plerumque elongatae, lobis intus plerumque papilloso extus laevibus et subcarnosis, nervis in lobis fere ad marginem; filamenta in parte superiore elongatae, cellularis inferioribus quadratis numerosis, parietibus leniter vel non annulate ornatis; basi stylorum plerumque nodulosi; rami stylorum papilloso; achaenia prismatica vel fusiformia; carpodia plerumque distincta, parietibus cellularum subtenuibus firmis; setae pappi saepe facile deciduae interdum breves aut squamiformes. Chromosomata numerus $X = 16-17, 20$.

Type genus Oxylobus (Moc. ex DC) A. Gray.

The subtribe contains 7 genera but excludes MacVaughia which was associated by King & Robinson (1970) but which proves a close relative of Stevia instead.

Key to the genera of the subtribe Oxylobinae

1. Leaves trifoliolate . . . Standleyanthus K. & R. 1 sp.
1. Leaf blades simple 2
 2. Stems thick with fleshy cortex; leaves absent at anthesis Pachythamnus K. & R. 1 sp.
 2. Stems not thickened; not seasonally defoliated. .3
3. Heads with paleae Jaliscoa Watson 3 spp.
3. Heads without paleae. 4
 4. Corolla lobes papillose on outer surface; styles not enlarged near base
Spaniopappus B. L. Robinson 5 spp.
 4. Corolla lobes smooth on outer surface; styles usually with basal node 5
5. Pappus reduced to short scales
Oxylobus (Moc. ex DC.) Gray 5 spp.
5. Pappus of capillary bristles, often fragile. . . 6
 6. Carpopodium differentiated with sclerified cells, sometimes long-cylindrical; corolla lobes never completely smooth on inner surface
Ageratina Spach 242 spp.
 6. Carpopodium not differentiated; corolla lobes sometimes completely smooth on inner surface.
Piptothrix Gray 6 spp.

Ageratina Spach subgenus Andinia R. M. King & H. Robinson, subgenus nov. Plantae frutescentes; folia coriacea, nervis plerumque pinnatae; squamae involucri eximbricatae vel leniter subimbricatae; corollae extus glanduliferae vel glabrae, tubis non tenuibus, lobis brevioribus quam faucis intus dense papillosis; basi stylorum leniter nodulosi, rami stylorum valde papilloosi; achaenia glandulifera interdum breviter setifera; carpopodia breviter rotundatae, cellulis plerumque quadratis; setae pappi subpersistens. Chromosomatum numerus basicum $X = 20$.

Type species Eupatorium exerto-venosum Klatt

Distribution: Northern Andes from Colombia and Venezuela south to Bolivia. The subgenus contains the following 38 species.

<u>Ageratina</u>	<u>ampla</u>	Colombia
<u>Ageratina</u>	<u>angustifolia</u>	Colombia
<u>Ageratina</u>	<u>arbutifolia</u>	Colombia
<u>Ageratina</u>	<u>aristei</u>	Colombia
<u>Ageratina</u>	<u>baccharoides</u>	Colombia
<u>Ageratina</u>	<u>boyacensis</u>	Colombia
<u>Ageratina</u>	<u>chachapoyensis</u>	Peru
<u>Ageratina</u>	<u>crassiceps</u>	Colombia
<u>Ageratina</u>	<u>cuatrecasasii</u>	Colombia
<u>Ageratina</u>	<u>dendroides</u>	Ecuador
<u>Ageratina</u>	<u>elegans</u>	Colombia
<u>Ageratina</u>	<u>exerto-venosa</u>	Ecuador, Peru
<u>Ageratina</u>	<u>fastigiata</u>	Colombia
<u>Ageratina</u>	<u>flaviseta</u>	Colombia
<u>Ageratina</u>	<u>gloeclada</u>	Bolivia
<u>Ageratina</u>	<u>glyptophlebia</u>	Colombia
<u>Ageratina</u>	<u>gynoxides</u>	Colombia
<u>Ageratina</u>	<u>humboldtii</u>	Colombia
<u>Ageratina</u>	<u>jahnii</u>	Venezuela
<u>Ageratina</u>	<u>lopez-mirandae</u>	Peru
<u>Ageratina</u>	<u>macbridei</u>	Peru
<u>Ageratina</u>	<u>mutiscuensis</u>	Colombia
<u>Ageratina</u>	<u>nerifolia</u>	Venezuela
<u>Ageratina</u>	<u>ocanensis</u>	Colombia
<u>Ageratina</u>	<u>paramensis</u>	Venezuela
<u>Ageratina</u>	<u>piurae</u>	Peru
<u>Ageratina</u>	<u>pomaderrifolia</u>	Colombia
<u>Ageratina</u>	<u>popayanensis</u>	Colombia
<u>Ageratina</u>	<u>prunifolia</u>	Ecuador
<u>Ageratina</u>	<u>pseudochilca</u>	Ecuador
<u>Ageratina</u>	<u>stevioides</u>	Venezuela
<u>Ageratina</u>	<u>subferruginea</u>	Peru
<u>Ageratina</u>	<u>theaefolia</u>	Venezuela, Colombia
<u>Ageratina</u>	<u>tinifolia</u>	Venezuela, Colombia
<u>Ageratina</u>	<u>vacinniaefolia</u>	Colombia
<u>Ageratina</u>	<u>viscosa</u>	Ecuador
<u>Ageratina</u>	<u>wurdackii</u>	Peru
<u>Ageratina</u>	<u>latipes</u>	Colombia

Ageratina Spach subgenus Apoda R. M. King & H. Robinson, subgenus nov. Plantae suffrutescentes; folia herbacea, trinervata; squamae involucris leniter subimbricatae; corollae extus glanduliferae, tubis non tenuibus; lobis brevioribus quam faucibus intus leniter papillosis; basi stylorum non nodulosi; rami stylorum brevior papilloso; achaenia glandulifera; carpodia

breviter rotundatae, cellulis plerumque quadratis; setae pappi subpersistens. Chromosomatum numerus ignotum.

Type species Eupatorium pentlandianum DC.

Distribution: Peru and Bolivia. The subgenus contains the following 5 species.

Ageratina cuzcoensis Peru

Ageratina dombeyana Peru

Ageratina pentlandiana Peru, Bolivia

Ageratina simulans Peru

Ageratina stictophylla Peru

Three species of Ageratina have been found to have notable range extensions. Ageratina atrocordata (B.L. Robinson) K. & R. of Chiapas is identical in all essential features with the more recently described Ageratina fosbergii K. & R. found in adjacent Guatemala. Ageratina carmonis (Stand. & Steyer.) K. & R. of Guatemala has been found in Mexico in Oaxaca, Trip to Zempoaltepetl, Cañon of the Rio Tlahuitoltepec, Feb. 19-27, 1937. Camp 2723 (NY,US). The species is notable for its extremely long petioles. Ageratina (Neogreenella) ovilla (Stand. & Steyer.) K. & R. of Guatemala has now been seen from Mexico: Oaxaca: La Esperanza, ca. 5,000', Comaltepec, Ixtlan. 1 March 1970. MacDougall s.n. (NY); Oaxaca: On Mexico 175 heading north to Valle Nacional, 38.8 miles north of Ixtlan de Juarez, 1 Feb. 1971. Stone & Broome 2800 (DUKE). An additional specimen of interest has been seen from Guatemala: Santa Elena, Dept. Chimaltenango, alt. 2,400-2,700 m., March 25, 1933. Skutch 334 (US). The latter was determined by B. L. Robinson as Eupatorium glabratum HBK a species of central Mexico. Ageratina ovilla is actually most closely related to A. reticulifera (Stand. & L. O. Williams) K. & R. of Costa Rica, which has the small vine like habit with regularly squarrosely spreading branches.

Ageratina almedae R. M. King & H. Robinson, sp. nov.

Plantae suffrutescentes vel frutescentes ca. 1 m altae. Caules fulvescentes teretes dense hirtelli. Folia opposita, petiolis 10-35 mm longis; laminae ovatae 4-8 cm longae 2-5 cm latae base breviter obtusae margine serratae vel duplo-serratae apice breviter anguste acuminatae supra et subtus sparse puberulae in nervis et nervulis minute hirtellae fere ad basem distincte trinervatae. Inflorescentiae late multistratosae corymbosae, ramis ultimis plerumque 5-10 mm longis dense hirtellis. Capitula 5-6 mm alta et 3-5 mm lata; squamae involucris eximbricatae ca. 16 ca. 2-seriatae lineari-lanceolatae plerumque 4 mm longae 0.5-0.7 mm latae margine anguste scariosae apice peranguste acutae squamae exteriores extus distincte bicostatae hirtellae.

Flores ca. 20-25 in capitulo; corollae albae ca. 3 mm longae, tubis 1.5 mm longis paucae vel non piliferis tenuibus superne non latioribus, limbis late campanulatis, faucis ca. 1 mm longis sparse piliferis inferne abrupte constrictis, lobis triangularibus ca. 0.6 mm longis et 0.5 mm latis extus dense piliferis; filamenta in parte inferiore ca. 0.4 mm longa in parte superiore ca. 0.3 mm longa; thecae ca. 0.6 mm longae; appendices antherarum oblongo-ovatae ca. 0.2 mm longae et 0.15 mm latae; basi stylorum distincte nodulosi; rami stylorum intus in parte superiore interstigmatice et in parte inferiore appendicis paucae glanduliferis; achaenia ca. 1.7 mm longa aliquantum fusiformia in costis breviter setifera; setae pappi ca. 26 plerumque 2.5-2.8 mm longae superne vix latiores, setae exteriores paucae 0.1-0.2 mm longae. Grana pollinis ca. 22 μ in diametro.

TYPE: COSTA RICA: SAN JOSE: along route 216, ca. 2-3 kms N of Nubes. Elevation ca. 5,200 ft. Several plants $\frac{1}{2}$ meter tall, partial shade, flowers white. June 13, 1974. Robert M. King 6777 (Holotype US). Additional specimens seen: COSTA RICA: SAN JOSE: Along route 216, ca. 8 kms generally N of Nubes. Elevation ca. 4,900 ft. HEREDIA: Costa Rica #113 road to Angeles Cerro Redondo (La Cruz). Abandoned footpath at road terminus- wooded slopes adjoined by areas of second growth vegetation. Altitude 1,800-1,900 m 17 April 1971, F. Almeda 452 (DUKE, US). HEREDIA: Volcan Barba, Cerro Chompipe nr. Ermita Sta. Cruz. Collections from boggy marsh at 2,000 m. January 30, 1965, K. Lems 650130-01 (NY).

Ageratina almedae is among the Costa Rican species with obtuse to acute bases of the leaf blades but is distinctive in the trinervate venation and the densely hirtellous stems and pedicels. The new species is also rather distinctive in the comparatively short throat of the corolla.

Ageratina davidsei R. M. King & H. Robinson, sp. nov.

Plantae frutescentes 1 m altae. Caules rubrescentes tandem fulvescentes teretes dense puberuli. Folia opposita, petiolis plerumque 5-10 mm longis; laminae ovatae 3.0-4.5 cm longae et 1.2-2.0 cm latae base rotundatae vel breviter acuminatae margine argute serratae apice breviter anguste acuminatae supra sparse pilosulae subtus pallidiores in nervis et nervulis puberulae, laminae 3-10 mm supra basem distincte trinervatae, nervis secundariis paucis basilioribus tenuioribus. Inflorescentiae laxae corymbosae, ramis ultimis 5-12 mm longis dense puberulis. Capitula 5-6 mm

alta et 4-5 mm lata; squamae involucris eximbricatae ca. 10 ca. 2-seriatae oblanceolatae plerumque 2.5-3.0 mm longae et superne 1 mm latae margine et apice subscariosae apice acutae extus distincte bicostatae sparse puberulae. Flores ca. 30 in capitulo; corollae albae ca. 4 mm longae, tubis 1.5-1.8 mm longis glabris tenuibus superne non latioribus, limbis anguste campanulatis, faucis ca. 1.5 mm longis plerumque glabris inferne abrupte constrictis, lobis triangularibus ca. 0.7 mm longis et 0.55 mm latis extus piliferis; filamenta in parte superiore ca. 0.2 mm longa; thecae ca. 0.7 mm longae; appendices antherarum oblongo-ovatae ca. 0.22 mm longae et 0.15 mm latae; basi stylorum leniter nodulosi; rami stylorum intus in parte superiore interstigmaticae et in parte inferiore appendicis paucis glanduliferis achaenia ca. 1.7 mm longa aliquantum fusiformia in costis setifera; setae pappi ca. 18 plerumque 3 mm longae superne leniter latiores, seriebus exterioribus nullis vel subnullis. Grana pollinis ca. 23μ in diametro.

TYPE: COLOMBIA: Caqueta: Cordillera Oriental; 29 km SE of Guadalupe along road to Florencia, near divide of mountains, just across HUILA border; cloud forest; elev. 2,300 m. flowers white, shrub 1 m. January 9, 1974. G. Davidse 5622 (HOLOTYPE US, ISOTYPE MO).

Ageratina davidsei is a member of the subgenus Ageratina and has some resemblance to the Colombian A. psilodora (B. L. Robinson) K. & R. The latter differs most obviously by the glabrous stems and the herbaceous habit. The new species is also rather distinctive in the lax inflorescence with small heads having short involucre bracts.

Ageratina peracuminata R. M. King & H. Robinson, sp. nov. Plantae herbaceae vel suffrutescentes laxae usque ad 1.5 m altae mediocriter ramosae. Caules pallide fuscescentes teretes distincte hirsuti. Folia opposita, petiolis 2-6 cm longis; laminae ovatae vel subdeltoideae 3.5-7.5 cm longae et 2.3-6.4 cm latae base truncatae in medio breviter acuminatae trinervatae margine serratae apice abrupte anguste acuminatae supra sparse pilosae in nervis dense pilosae subtus pallidiores in nervis et nervulis sparse pilosis, nervulis ultimis non prominulis. Inflorescentiae late subapplanate corymbosae, ramis ultimis 1-7 mm longis dense puberulis. Capitula 4 mm alta et ca. 3 mm lata; squamae involucris eximbricatae ca. 15 ca. 2-seriatae anguste ellipticae 2.5-3.0 mm longae et 0.5-0.7 mm latae margine distincte scariosae apice anguste acutae sub-

scariosae extus distincte bicostatae puberulae. Flores 16-22 in capitulo; corollae albae 2.0-2.5 mm longae, tubis ca. 1 mm longis perangustis superne vix latioribus, limbus 1.0-1.5 mm longis anguste campanulatis inferne glabris plerumque lobis triangularibus extus piliferis ca. 0.5 mm longis et 0.4 mm latis, lobis exterioribus corollarum exteriorius majoribus usque ad 0.7 mm longis et 0.5 mm latis; filamenta in parte superiore ca. 0.23 mm longa; thecae 0.5-0.6 mm longae; appendices antherarum oblongo-ovatae 0.15 mm longae et 0.14 mm latae; basi stylorum distincte nodulosi; rami stylorum intus in parte superiore interstigmatice et in parte inferiore appendicis glanduliferi, cellulis basilaribus glandularum brevibus subscleroides; achaenia ca. 1.5 mm longa aliquantum fusiformia in costis et superne dense setifera; setae pappi ca. 18 plerumque ca. 2 mm longae superne leniter latiores, seriebus exterioribus 0.05-0.15 mm longis. Grana pollinis ca. 20 μ in diametro.

TYPE: MEXICO: OAXACA: In brush at edges of mixed pine and deciduous subtropical forest, on the Pacific slope of the Sierra Madre del Sur, not far below the summit, in granitic region, 49 miles north of Puerto Escondido. Elevation about 6,100 ft. Lax shrubs or half-shrubs up to 1.5 m tall. Flowers white. Chromosome no. det by R. C. Jackson as $n = ca. 16-17$. November 8, 1965. Arthur Cronquist & Mario Sousa 10513 (Holotype, US).

Ageratina peracuminata was distributed under the name Eupatorium (Ageratina) malacolepis B. L. Robinson which is similar in the small size of the heads and flowers. The latter species is considered here to include Ageratina xanthochlora (B. L. Robinson) K. & R. and is characterized by having small glabrous achenes. The new species is also related to A. bustamenta (DC) K. & R. which includes Eupatorium aschenbornianum Schauer. The new species is distinguished from both relatives by fewer flowers in the head and by the slightly zygomorphic corollas of the peripheral flowers. In general aspect the broad leaves with strongly acuminate tips and the flat-topped inflorescences seem distinctive.

Ageratina salicifolia R. M. King & H. Robinson, sp. nov.

Plantae frutescentes usque ad 1 m altae. Caules atro-rubrescentes teretes glabri vel glabrescentes. Folia opposita, petiolis subnullis; laminae subcarnosae lineari-lanceolatae 4-9 cm longae et 0.4-1.5 cm latae base cuneatae margine remote serratae apice

anguste acutae supra et subtus in nervis puberulae supra fere ad marginem pilosulae caetera glabrae subtus pallidiores, fere ad basem valde trinervatae, nervis secundariis subparallelis. Inflorescentiae thyrsoideo-paniculatae, ramis corymbosis, ramis ultimis tenuibus 7-12 mm longis dense puberulis. Capitula ca. 6 mm alta et 4-5 mm lata; squamae involucris eximbricatae ca. 18 ca. 2-seriatae plerumque 4.0-4.5 mm longae et ca. 0.8 mm latae margine anguste scariosae apice subscariosae acute extus sublitter bicostatae exteriores dense minute puberulae. Flores ca. 30 in capitulo; corollae albae ca. 4 mm longae, tubis ca. 2 mm longis piliferis tenuibus superne latioribus, limbis anguste campanulatis, faucis ca. 1.5 mm longis sparse piliferis inferne leniter constrictis, lobis triangularibus ca. 0.7 mm longis et 0.5 mm latis extus dense piliferis; filamenta in parte inferiore 0.20-0.35 mm longa in parte superiore 0.20-0.25 mm longa; thecae ca. 1 mm longae; appendices antherarum oblongo-ovatae ca. 0.2 mm longae et 0.18 mm latae; basi stylorum leniter nodulosi; appendices stylorum intus inferne paucis glanduliferae; achaenia ca. 2 mm longa aliquantum fusiformia in costis dense setifera; setae pappi ca. 20 plerumque 3.5-4.0 mm longae superne distincte latiores, setae exteriores 0.15-0.50 mm longae. Grana pollinis ca. 23 μ in diametro.

TYPE: MEXICO: DURANGO: Steep narrow ravines in precipitous mountainsides along the Mazatlan-Durango highway 3-15 km toward El Salto from the Sinaloa boundary at El Palmito; pine forest zone, with deciduous trees in humid ravines; elevation 1,950-2,200 m. Woody herb in clumps, 1 m. high or less; flowers white. 13 April 1965, McVaugh, Baad, Anderson & Laskowski 23,611 (Holotype NY).

Ageratina salicifolia is easily distinguished by the narrow sessile leaves. The combination of narrow leaves and thyrsoid-paniculate inflorescence provide some resemblance to A. enixa (B.L. Robinson) K. & R. which occurs at high elevations in central Mexico, but the latter is a much smaller plant with distinctive petiolate leaves that are not at all subcarinate.

Ageratina sinaloensis R. M. King & H. Robinson, sp. nov. Plantae suffrutescentes 1-2 m altae? laxae ramosae. Caules rubrescentes tandem fulvescentes teretes hirsuti. Folia opposita, petiolis 2-5 cm longis; laminae ovatae 5.5-12.0 cm longae et 4.8 cm latae base rotundatae et in medio breviter acuminatae

marginē serratae vel grosse serratae apice breviter subacuminatae supra sparse pilosae subtus sparse minute glanduliferae plerumque in nervis et nervulis pilosulae fere ad basem valde trinervatae, nervis secundariis valde ascendentibus ad basem decurrentibus. Inflorescentiae multistratose corymboso-paniculatae, ramis ultimis plerumque 5-8 mm longis dense puberulis. Capitula ca. 7 mm alta et 4-5 mm lata; squamae involucri eximbricatae ca. 20 ca. 2-seriatae oblongo-lanceolatae plerumque 4-5 mm longae et 0.7-1.0 mm latae margine anguste scariosae apice anguste acutae extus distincte bicostatae squamae exteriores dense puberulae. Flores 30-40 in capitulo; corollae albae 3.5 mm longae, tubis 1.5 mm longis glabris superne non latioribus, limbis ca. 2 mm longis ca. 2 mm longis abrupte anguste campanulatis; faucis plerumque glabris, lobis triangularibus ca. 1.0 mm longis et 0.7 mm latis extus piliferis; filamenta in parte inferiore ca. 0.25 mm longa, in parte superiore ca. 0.3 mm longa; thecae ca. 0.7 mm longae; appendices antherarum oblongo-ovatae ca. 0.27 mm longae et 0.18 mm latae apice rotundatae; basi stylorum distincte nodulosi; rami stylorum intus in parte superiore interstigmaticae et in parte inferiore appendicis glanduliferi; achaenia 1.8-2.0 mm longa aliquantum fusiformia in costis et superne dense setifera; setae pappi ca. 20 plerumque ca. 3 mm longae superne distincte latiores, seriebus exterioribus subnullis. Grana pollinis defectiva.

TYPE: MEXICO: SINALOA: Cayon de Tarahumare, Sierra Surotato. Deep wooded canyon; mixed subtropical vegetation. Elev. 3,000-4,000 ft. March 17-24, 1945. Howard Scott Gentry 7303 (Holotype US).

The new species is obviously closely related to the widely distributed A. bustamenta but is in an area beyond the western limits of the distribution of the latter. Ageratina sinaloensis can be distinguished by the large lower leaves and by the notable decurrence of the secondary veins. The lateral veins in Ageratina bustamenta are never decurrent.

Ageratina (Andinia) lopez-mirandae R. M. King & H. Robinson, sp. nov. Plantae frutescentes ca. 1 m altae ? glutinosae. Caules teretes dense glanduliferi et subtomentosi. Folia opposita, petiolis 3-5 mm longis; laminae ellipticae plerumque 2.5-5.0 cm longae et 7-20 mm latae base acutae margine supra medio minute serrulatae apice breviter acutae supra et subtus glandulopunctatae supra in nervis et nervulis puberulae subtus in nervis pilosae in nervulis puberulae, nervis secundariis paucis irregulariter ascendentibus, nervulis non

prominulis. Inflorescentiae late corymbosae, ramis ultimis 4-10 mm longis dense glanduliferis et subtomentosis, bracteis subinvolucratis numerosis linearibus plerumque 11-13 mm longis et ca. 0.5 mm latis glanduliferis et sparse puberulis. Capitula ca. 11 mm alta et 3-4 mm lata; squamae involucris eximbricatae ca. 10 ca. 2-seriatae lanceolatae 7-9 mm longae et 1.0-1.5 mm latae margine vix scariosae apice anguste acutae vel acuminatae extus vix bicostatae dense glandulo-punctatae puberulae. Flores 10 in capitulo; corollae albae 7.0-7.5 mm longae, tubis 1.5-2.0 mm longis superne vix latioribus extus glanduliferis, faucis 4.5-5.0 mm longis cylindraceis inferne leniter constrictis plerumque glabris, lobis triangularibus 0.9 mm longis et 0.5-0.6 mm latis extus sparse glanduliferis interdum pauce piliferis; filamenta in parte superiore ca. 0.6 mm longa; thecae ca. 1.7 mm longae; appendices antherarum oblongo-ovatae ca. 0.40 mm longae et 0.26 mm latae; basi stylorum distincte nodulosi; rami stylorum intus dense glanduliferi, etiam canalis superiore stylorum dense glanduliferis; achaenia 3.0-3.3 mm longa glandulifera et plerumque breviter setifera inferne non vel breviter stipitata; setae pappi 30-40, seriebus exterioribus 0.5-2.0 mm longis, seriebus interioribus plerumque 6-7 mm longis superne non latioribus. Grana pollinis ca. 30 μ in diametro.

TYPE: PERU: LA LIBERTAD: OTUZCO: Cerro Sango (Motil-Shorey) km 106, 3,300-3,400 m. 7-VI-1953, A. Lopez M. 0972 (Holotype US). Additional specimens seen: Peru: La Libertad: Otuzco, alrededores de Chota. 2,850 m 23-IX-73, A. Lopez M. et A. Sagastegui A. 8066, and 8047 (Paratypes US).

Ageratina lopez-mirandae is in the same group of species with A. wurdackii and A. prunifolia and shares a similar habit and leaf shape. The presence of densely glanduliferous style branches with glands in the upper part of the stylar canal also seems to be a feature in the group. The new species is most obviously distinct by the heads subtended by many long linear bracts. The subinvolucral bracts are particularly prominent in less mature material where they exceed the height of the head. The bracts are less evident in over-mature specimens. Other distinguishing characters of the species are the short-petiolate leaves with tomentum on the under surface and the heads with only ten flowers.

Ageratina (Andinia) wurdackii R.M.King & H. Robinson,

sp. nov. Plantae frutescentes vel suffrutescentes 0.3-1.0 m altae glutinosae in caulibus marginis et paginae adaxialis foliorum pedicellis squamis involucris purpureo-tinctae. Caules teretes dense glanduliferi. Folia opposita sessilia vel subsessilia; laminae ellipticae plerumque 2.5-5.5 cm longae et 1.2-2.5 cm latae base acutae margine dense crenulato-serrulatae apice breviter acutae supra et subtus glandulo-punctatae subtus pallidiores, nervis pinnatis, nervulis in reticulo minuto distincte prominulis. Inflorescentiae late corymbosae, ramis ultimis 5-25 mm longis minute stipitato-glanduliferis. Capitula ca. 11 mm alta et 6-9 mm lata; squamae involucris eximbricatae ca. 20 ca. 2-seriatae oblongae vel late oblanceolatae 7-8 mm longae et 1.5-2.3 mm latae margine vix scariosae apice obtusae extus non costatae dense glandulo-punctatae. Flores ca. 30 in capitulo; corollae albae 6-7 mm longae, tubis 1.5-2.0 mm longis superne vix latiores extus glanduliferis, faucis 4.0-4.5 mm longis cylindraceis inferne leniter constrictis plerumque glabris, lobis ovato-triangularibus 0.8-0.9 mm longis et 0.6-0.7 mm latis extus glanduliferis; filamenta in parte superiore ca. 0.6 mm longa; thecae ca. 1.5 mm longae; appendices antherarum oblongae ca. 0.40-0.45 mm longae et 0.3 mm latae; basi stylorum leniter nodulosi; rami stylorum intus dense glanduliferi etiam canalis superioribus stylorum pauca glanduliferis; achaenia 3.0-3.5 mm longa in costis dense setifera et glandulifera inferne breviter stipitata; setae pappi 30-35, seriebus exterioribus 1.5-2.5 mm longis, seriebus interioribus 3.0-4.5 mm longis superne non latioribus. Grana pollinis ca. 28 μ m in diametro.

TYPE: PERU: Chachapoyas: Amazonas: Cerros Calla Calla, east side 19 km above Leimebamba on road to Balsas. Altitude 3,100 m. June 7, 1964, Paul C. Hutchison & J. Kenneth Wright 5574 (Holotype US). (Isotype NY). Paratype PERU: Chachapoyas: Amazonas: Middle eastern Calla-Calla slopes, near Kms 416-419 of Leimebamba-Balsas road, elevation 2,900-3,100 m July 9, 1962, J.J. Wurdack 1287.

Ageratina wurdackii is most easily distinguished by the sessile elliptical leaves and by the rather large heads. Members of the genus with which the new species shares some superficial resemblance are A. prunifolia (H.B.K.) K. & R. of Ecuador which has tomentum on the under surfaces of the leaves and on the pedicels, has short petiolate leaves, and has smaller heads with fewer flowers and comparatively longer pappus setae, and A. crassiceps (B. L. Robinson) K. & R. of Colombia which usually has large heads with long pedicels in small fascicles and has subimbricate

involucral bracts.

Ageratina (Neogreenella) cronquistii R. M. King & H. Robinson, sp. nov. Plantae frutescentes 1.3-2.0 m altae. Caules fulvescentes teretes dense puberuli et glanduliferi. Folia opposita, petiolis 5-10 mm longis; laminae ovatae plerumque 3-6 cm longae et 1.0-2.7 cm latae basi rotundatae margine serrulatae vel crenulato-serratae apice anguste acuminatae supra puberulae et glanduliferae subtus glandulo-punctatae in nervis et nervulis puberulae ad basem valde trinervatae nervulis non prominulis. Inflorescentiae thyrsoideo-paniculatae. ramis corymbosis, ramis ultimis 1-7 mm longis dense puberulis. Capitula ca. 9 mm alta et 2 mm lata; squamae involucris eximbricatae ca. 7 ca. 2-seriatae plerumque ca 4 mm longae et ca. 1 mm latae margine anguste subscariosae apice subscariosae obtusae extus vix costatae sparse puberulae vel glabrescentes. Flores 5-6 in capitulo; corollae albae 5.5-6.0 mm longae, tubis ca. 2 mm longis glabris superne leniter latioribus faucis ca. 3 mm longis glabris subcylindraceutis inferne leniter constrictis, lobis triangularibus ca. 0.7-0.8 mm longis et latis extus sparse glanduliferis; filamenta in parte superiore 0.30-0.35 mm longa; thecae ca. 1.5 mm longae; appendices antherarum oblongo-ovatae ca. 0.3 mm longae et 0.2 mm latae; basi stylorum vix nodulosi; rami stylorum intus in parte interstigmaticae et in parte inferiore appendicis glanduliferis; achaenia 2.8-3.0 mm longa non stipitata inferne in costis et superne dense setifera; setae pappi longiores ca. 30 plerumque 3.5-4.0 mm superne vix vel non latiores, seriebus exterioribus sparsis 0.2-0.8 mm longis. Grana pollinis ca. 25 μ in diametro.

TYPE: MEXICO: DURANGO: Open banks and cliff-crevices of felsitic rock in pine forest community on the west slope of the Sierra Madre Occidental, 36 miles WSW of El Salto, and 26 miles NE of El Palmito. Elev. about 8,600 feet. Shrubs up to 2 m tall. Corolla white, the pappus somewhat purplish. 14 November 1965, Arthur Cronquist & Mario Sousa 10542 (Holotype US). Paratype: MEXICO: DURANGO: 41 miles SW of El Salto along road to Mazatlan. Pine forest; alt. 9,000-9,500 feet. November 13, 1959, Gentry & Arguelles 18169 (US) distributed as Decachaeta haenkeana DC.

Ageratina cronquistii is distinct among the species of the subgenus Neogreenella by the combination of the few-flowered heads and the narrowly acuminate leaves. The bases of the pappus setae are somewhat reddish in both collections of the new species, and the holotype has distinctly reddish involucral bracts.

Ageratina (Neogreenella) macvaughii R. M. King & H. Robinson, sp. nov. Plantae herbaceae usque ad 1.5 m altae e basi prolificae superne non ramosae. Caules plerumque rubrescentes teretes dense minute stipitato-glanduliferi. Folia opposita, petiolis 2-6 cm longis; laminae late ovatae vel ovatae vel suborbiculares 5-14 cm longae et 3.5-11.5 cm latae base leniter cordatae margine serrulatae vel duplo-serrulatae apice breviter acuminatae supra et subtus in nervis et nervulis minute breviter stipitato-glanduliferae supra basem congestinervatae 1-2 cm supra basem distincte trinervatae, nervulis ultimis in reticulo minuto supra et subtus distincte prominulis. Inflorescentiae late thysoideo-paniculatae, ramis corymbosis, ramis ultimis 2-7 mm longis dense minute stipitato-glanduliferis. Capitula 7-9 mm alta ca. 3-4 mm lata; squamae involucri eximbricatae, ca. 22 ca. 2-seriatae plerumque 4-5 mm longae et 0.5-0.7 mm latae apice anguste acutae extus distincte bicostatae plerumque stipitato-glanduliferae. Flores ca. 30-35 in capitulo; corollae albae 4.5-5.0 mm longae, tubis ca. 2.0-2.5 mm longis inferne perangustis superne distincte latioribus glabris vel superne stipitato-glanduliferis, limbis infundibularibus ca. 3 mm longis, lobis triangularibus ca. 0.7 mm longis et 0.5 mm latis extus sparse glanduliferis raro minute spiculiferis; filamenta in parte superiore plerumque 0.3-0.4 mm longa; thecae ca. 1 mm longae; appendices antherarum oblongo-ovatae ca. 0.35 mm longae et 0.17 mm latae; basi stylorum distincte nodulosi; rami stylorum intus in parte interstigmaticae et interdum superne glanduliferi; achaenia ca. 1.5-1.8 mm longa base breviter constricta supra carpopodium in costis distincte setifera; setae pappi ca. 15 plerumque ca. 4 mm longae superne leniter latiores, seriebus exterioribus subnullis. Grana pollinis ca 23 μ in diametro.

TYPE: MEXICO: MICHOACAN: 3-6 km SW of Aserradero Dos Aguas and nearly W of Aguililla. Elevation 2,000-2,100 m. 25 November 1970, McVaugh, Graham & Stevens 24669 (Holotype US). Paratypes: MEXICO: Mexico: District of Temascaltepec: Nanchititla, G.B.Hinton 3079 US, Canada de Nanchititla, 1,800 m, Matuda 31967 US, En barranca, cerca de Amatepec, 1,500 m. Matuda 30031 US.

McVaugh identified his specimen no. 24669 as Eupatorium cardiophyllum B. L. Robinson which is similar in appearance and obviously closely related. The latter species occurs in Jalisco to the west of A. macvaughii and differs notably by the leaves which are

more deeply cordate and trinerved at the base, by the non-prominulous finer nervation, and by coarser glands, larger heads and less hairy achenes. The new species resembles Ageratina petiolaris(DC) K & R but that has glands mixed with hairs on most parts, veins of leaves not prominulous above, blades trinervate from the base, more densely corymbose inflorescences, and more densely setiferous achenes. The reduced number of pappus setae in A. macvaughii would seem rather distinctive but the easily deciduous setae of Ageratina must be counted with caution.

Ageratina (Neogreenella) ernstii R. M. King & H. Robinson, sp. nov. Plantae frutescentes 3 m altae mediocriter ramosae. Caules pallide fuscescentes teretes superficialiter subcarnosi sparse minute pilosi. Folia opposita, petiolis 2-6 cm longis; laminae late ovatae 5.5-10.5 cm longae et 3-8 cm latae base subtruncatae margine grosse serratae vel interdum duploserratae apice breviter acuminatae anguste argutae supra sparse minute pilosae subtus in nervis et nervulis minute pilosae vel puberulae in axillis nervorum validius pilosae, nervis secundariis utrinque ca. 4, binis secundariis 5-13 mm supra basem ascendentioribus, nervulis ultimis non prominulis. Inflorescentiae late thyrsoideo-paniculatae, ramis corymbosis, ramis ultimis 7-17 mm longis puberulis et distaliter densius stipitate glanduliferis. Capitula ca. 9-10 mm alta et 5-6 mm lata; squamae eximbricatae ca. 25 ca. 2-seriatae plerumque 8-9 mm longae et 0.5 mm latae apice longe attenuatae extus bicostatae dense stipitate glanduliferae. Flores ca. 30-50 in capitulo; corollae albae 5.0-5.5 mm longae glabrae, tubis 2.0-2.5 mm longis plerumque anguste cylindricis superne breviter leniter infundibularis, limbis anguste campanulatis ca. 3 mm longis, lobis triangularibus ca. 0.8 mm longis et ca. 0.4 mm latis; filamenta in parte superiore ca. 0.3 mm longa; thecae ca. 1.2 mm longae; appendices antherarum oblongae vel oblongo-ovatae ca. 0.25 mm longae et ca. 0.19 mm latae; basi stylorum leniter nodulosi; appendices stylorum non glanduliferae; achaenia ca. 3.5 mm longa base subelongata plerumque in costis scabrida superne distincte glandulifera; setae pappi ca. 25 plerumque 4.5 mm longae superne leniter latiores, seriebus exterioribus distinctis brevibus plerumque 0.2-0.3 mm longis. Grana pollinis ca. 23 μ in diametro.

TYPE: MEXICO: OAXACA: La Soledad, shrub 3 m, fls white, 9 Feb. 1966, W. R. Ernst 2569 (Holotype US).

See distinctions discussed under Ageratina salvadorensis.

Ageratina (Neogreenella) intibucensis R. M. King & H. Robinson, sp. nov. Plantae frutescentes 1-2 m altae mediocriter ramosae. Caules fuscescentes teretes glabri. Folia opposita, petiolis 2.5-4.0 cm longis; laminae ovatae 5-8 cm longae et 2.0-3.7 cm latae base late acutae margine crenato-serratae vel duplo-crenato-serratae apice subabrupte breviter acuminatae anguste argutae supra sparse minute puberulae vel subglabrae subtus pallidiores obscure sparse glandulo-punctatae, nervis pinnatis, nervis secundariis valde ascendentibus utrinque ca. 4, binis basilaribus et ca. 1 cm supra-basilaribus validioribus ad margines basilaria parallelis, nervulis non prominulis. Inflorescentiae late thyrsoido-paniculatae, ramis corymbosis, ramis ultimis 2-7 mm longis puberulis et stipitate glanduliferis. Capitula ca. 0.9-1.0 cm alta et 0.5-0.7 mm lata; squamae involucri eximbricatae ca. 20 ca. 2-seriatae subaequales 5-7 mm longae et ca. 0.8 mm latae apice acutae extus distincte bicostatae et stipitato-glanduliferae. Flores ca. 45 in capitulo; corollae subrosaceae ca. 5.5 mm longae glabrae, tubis infundubaris ca. 2.5 mm longis inferne perangustatis, superne distincte latioribus, limbis late campanulatis ca. 3 mm longis, lobis triangularibus ca. 1 mm longis et 0.7 mm latis; filamenta in parte superiore ca. 0.4 mm longa; thecae ca. 1.2 mm longae; appendices antherarum oblongo-ovatae ca. 0.3 mm longae et 0.2 mm latae; basi stylorum leniter nodulosi; appendices stylorum non glanduliferae; achaenia 3.5 mm longa base stipitato-elongata in costis scabrida superne dense breviter setifers raro uni-vel pauci-glandulifera; setae pappi 20-25 usque ad 4.5 mm longae superne leniter latiores, seriebus exterioribus distinctis brevibus 0.10-0.25 mm longis. Grana pollinis ca. 25 μ in diametro.

TYPE: HONDURAS: INTIBUCA: Cut over cloud forest between Calaveras and El Duraznillo on Cordillera Opalaca. Alt. 1,800 m March 12, 1970, Molina & Molina 25542 (Holotype US).

See distinctions discussed under Ageratina salvadorensis.

Ageratina (Neogreenella) salvadorensis R. M. King & H. Robinson, sp. nov. Plantae frutescentes ca. 2 m

altae mediocriter ramosae. Caules fuscescentes teretes glabri distincte lenticelliferi. Folia opposita, petiolis 1-2 cm longis; laminae ovatae 3.5-6.5 cm longae base rotundatae margine subserrulatae apice subabrupte breviter acuminatae anguste argutae supra et subtus in nervis et nervulis sparse minute puberulae subtus pallidiores obscure sparse glandulo-punctatae, nervis secundariis utrinque ca. 4, binis secundariis 5-7 mm supra basem ascendentioribus, nervis et nervulis supra et subtus distincte prominulis. Inflorescentiae late thyrsoido-paniculatae, ramis corymbosis, ramis ultimis 6-15 mm longis dense minute puberulis. Capitula 8-9 mm alta et ca. 5 mm lata; squamae involucri exteriores 2-3 lineares pauce puberulae, squamae interiores eximbricatae 16-18 ca. 2-3-seriatae subaequales ca. 5 mm longae et 1.0-1.2 mm latae apice subcariosae rotundatae vel subobtusae extus distincte bicostatae vel 4-costatae distincte puberulae sparse glanduliferae margine dense puberulae. Flores ca. 17 in capitulo; corollae albae ca. 5.5 mm longae, tubis angustis ca. 2 mm longis; superne non latioribus, limbis late infundibularibus ca. 3.5 mm longis, faucis glabris, lobis triangularibus ca. 1 mm longis et 0.6 mm latis extus pauce glanduliferis et setiferis, setis elongatis tenuibus; filamenta in parte superiore ca. 0.3 mm longa; thecae ca. 1.3 mm longae; appendices antherarum ovatae ca. 0.3 mm longae et 0.17 mm latae; basi stylorum leniter nodulosi; appendices stylorum non glanduliferae; achaenia 2.5 mm longa base breviter plerumque glabra superne pauce setifera; setae pappi interiores ca. 25 plerumque ca. 4 mm longae superne leniter latiores, seriebus exterioribus distinctis longis usque ad 0.7 mm longis. Grana pollinis ca. 25 μ in diametro.

TYPE: EL SALVADOR: SANTA ANA: Elfin woodland at summit of Cerro Monte Cristo, elevation about 7,500 ft, March 19, 1959, Paul H. Allen & Robert Armour 7284 (Holotype US, Isotype NY).

Three of the new species A. ernstii, A. intibucensis and A. salvadorensis form a related group in the subgenus Neogreenella all sharing a shrubby habit, leaves with strongly ascending pinnate or subtrinervate secondary veins, broadly thyrsoid-paniculate inflorescences, and non-glanduliferous style branches. Of the three species A. salvadoriensis is the most distinct having shorter petioles, less serrate leaves, distinctly prominulous venation, broader blunter non-glanduliferous involucral bracts, smaller number of flowers per head, and corolla lobes bearing glands and slender hairs. The other two species share most technical

Characters and are obviously closely related in spite of wide geographic separation. Ageratina ernstii of southern Oaxaca is distinguished by the more pubescent stems and leaves, by the broader subtruncate leaves with large teeth, by the less ascending basal pair of secondary veins, by the longer more attenuate tips of the involucre bracts, and by the shorter bases of the achenes. Ageratina itibucensis of Honduras presents a much different aspect with more narrowly ovate leaves having acute bases and small teeth, but can also be distinguished by the long attenuate base of the achene.

Ageratina (Neogreenella) subinclusa (Klatt) R.M.King & H. Robinson, comb. nov. Eupatorium subinclusum Klatt, Leopoldina 20:75. 1884.

Re-examination using additional characters seems to verify the synonymy given by B. L. Robinson (1925). As such the name takes priority over Eupatorium subpenninervium Klatt which was published in a later fascicle of the same article.

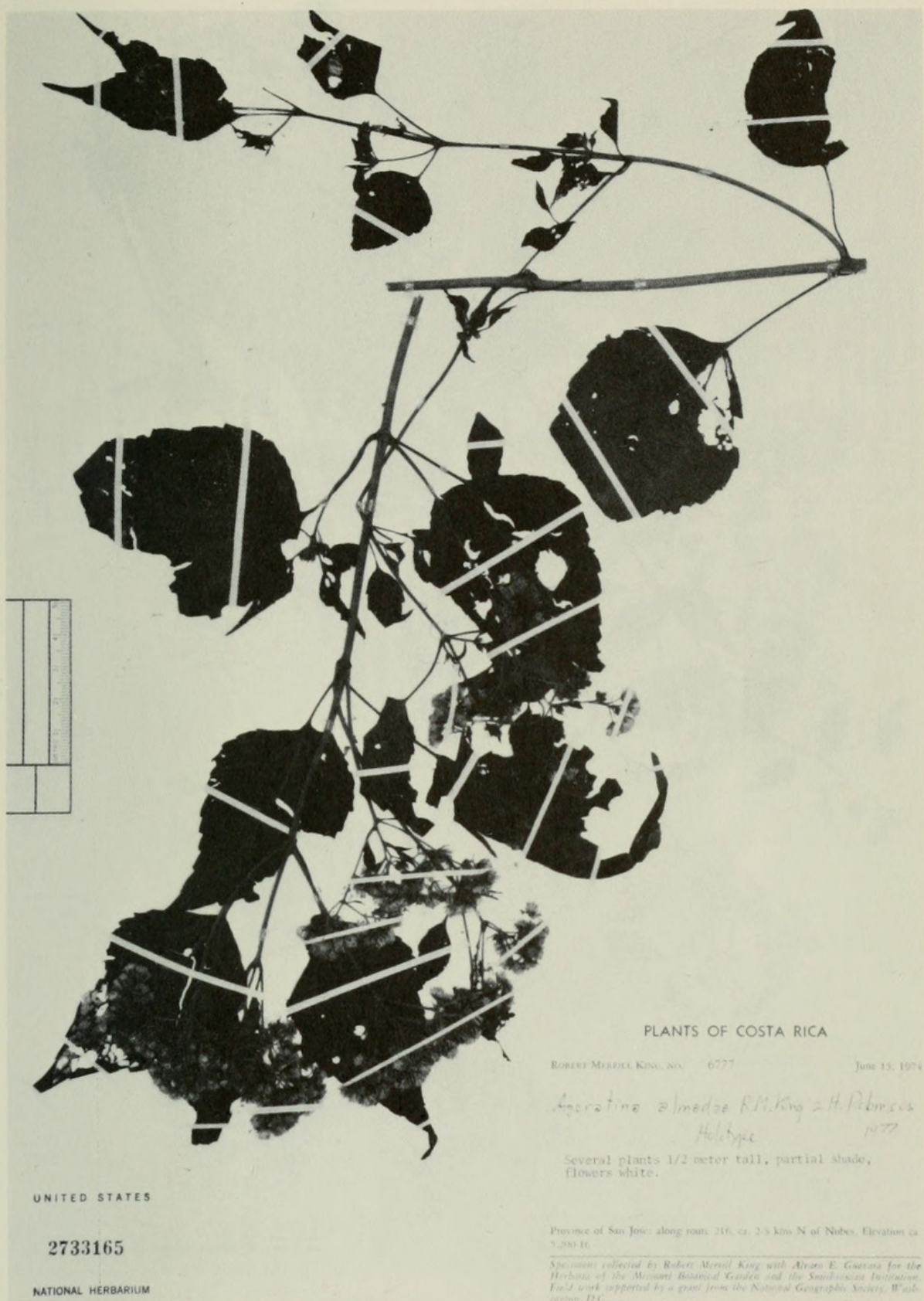
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Acknowledgement

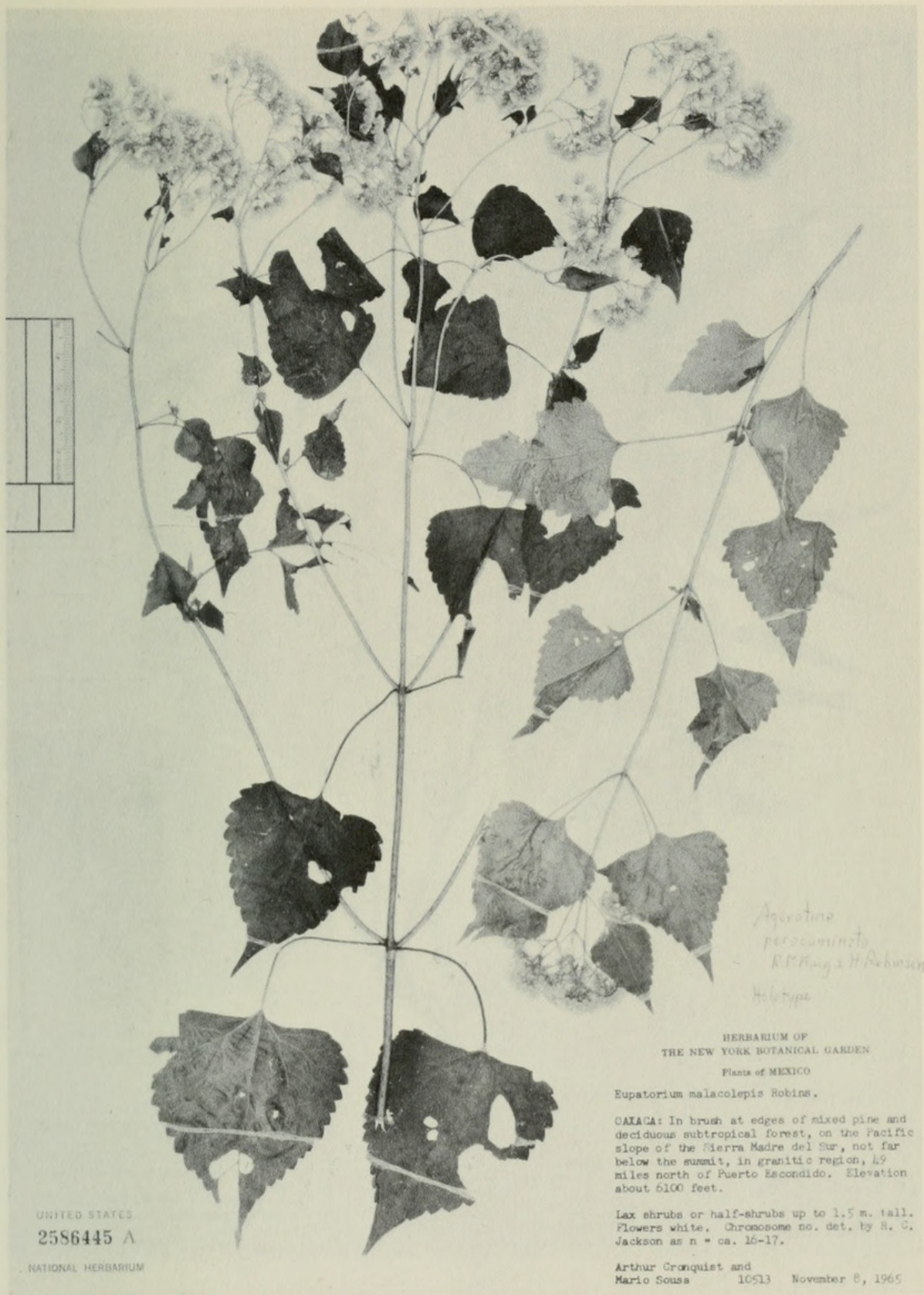
This study was supported in part by the National Science Foundation Grant DEB77-13457 to the senior author.



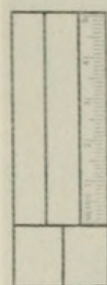
Ageratina almedae R.M. King & H. Robinson, Holotype,
United States National Herbarium. Photos by Victor E.
Krantz, Staff Photographer, National Museum of Natural
History.



Ageratina davidsei R.M. King & H. Robinson,
Holotype, United States National Herbarium.



Ageratina peracuminata R.M. King & H. Robinson,
Holotype, United States National Herbarium.



PLANTS OF DURANGO

COLLECTED FOR THE HERBARIUM OF THE UNIVERSITY OF MICHIGAN BY
ROBERT M. VAUGHN, M. F. BRAD, W. E. ANDERSON AND C. W. LARKOWSKI

Eupatorium

Steep sunny ravine in pine-oak montefrío along the
Matamoros-Durango highway, 5-15 km. toward El Salto from the
Sonoran boundary at El Palmito; pine forest zone, with deciduous
trees in the humid ravine; elevation 1950-2000 m.Steep sunny rocks in seepage area,
elev. 2200 m.Woody herb in clumps, 1 m. high or
less; flowers white.

UNITED STATES NATIONAL HERBARIUM

Ageratina salicifolia H. Robinson 2
Holotype R.M. King

det. R. M. King and H. Robinson

ROBERT M. VAUGHN, NO. 23611

12 APRIL 1965

Ageratina salicifolia R.M. King & H. Robinson,
Holotype, New York Botanical Garden.



Ageratina sinaloensis R.M.King & H.Robinson,
Holotype, United States National Herbarium.



Ageratina lopez-mirandae R.M. King & H. Robinson,
Holotype, United States National Herbarium.



UNITED STATES

2755982

NATIONAL HERBARIUM

UNITED STATES NATIONAL HERBARIUM

Ageratina wurdackii R.M. King & H. Robinson
Holotype

Det. R. M. King and H. Robinson 1977

UNIVERSITY OF CALIFORNIA
Seventh Botanical Garden Expedition to the Andes, 1963-1964
Director, Paul C. Hutchison

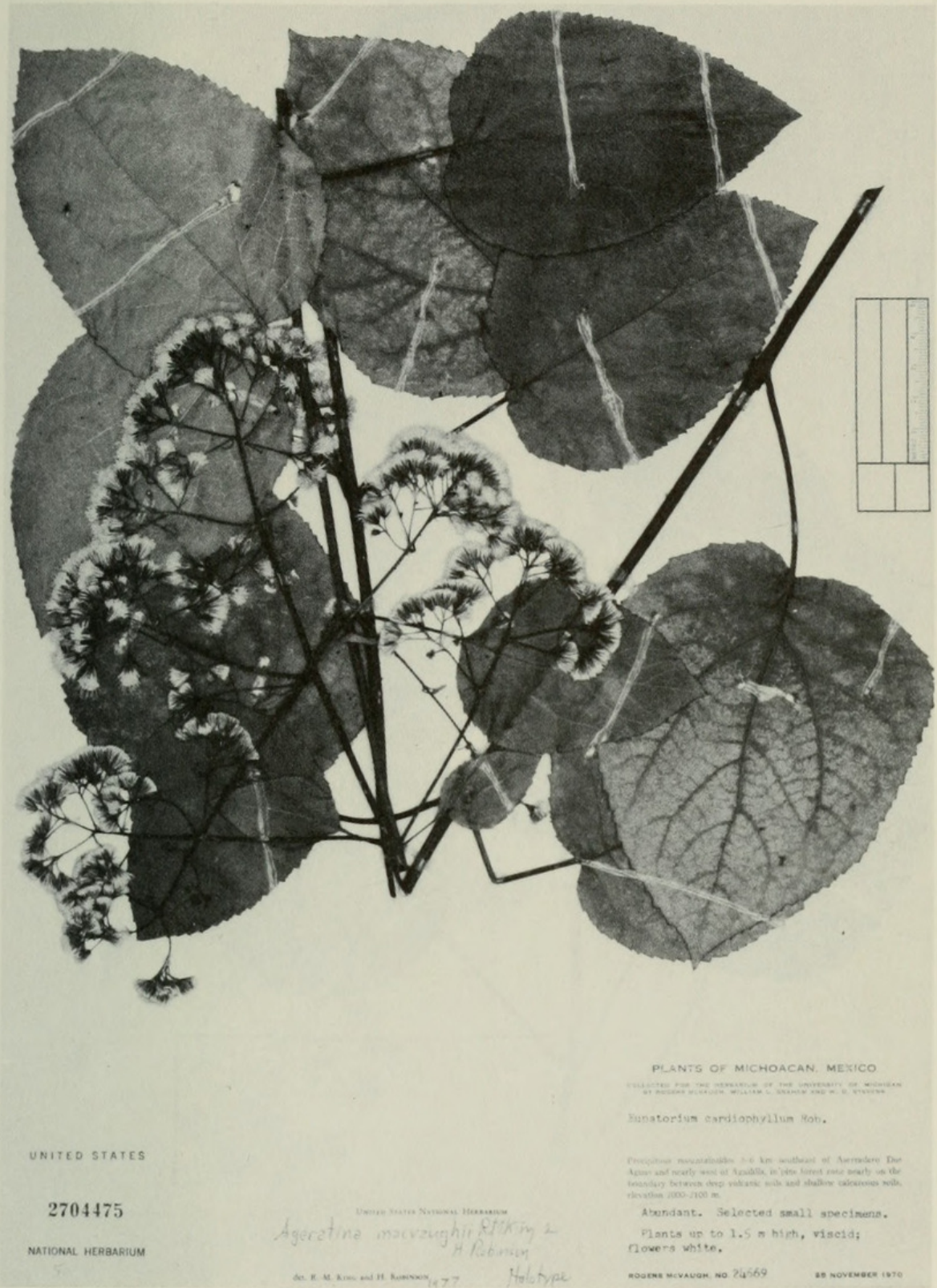
PERU

Eupatorium sp.
det. J. Oustrecanac, 1967Cerro Calla Calla, east side, 14 km. above Leimebamba on
the road to Balsas. Altitude 3100 m.
Province of Chachapoyas, Department of AmazonasPAUL C. HUTCHISON
J. KENNETH WRIGHT 5574 7 June 1964
DISTRIBUTED BY THE HERBARIUM OF THE UNIVERSITY OF CALIFORNIAUNIVERSITY OF CALIFORNIA
Seventh Botanical Garden Expedition to the Andes, 1963-1964
Director, Paul C. HutchisonAdditional field notes for 5574: Perennial herb
25-50 cm. Sticky all over. Flowers white.
Scales, pedicels, stems, leaf edges and faces
shaded purplish.Collection number: 5574 Size of set: 8 Set 1, UC,
determiner's set: 55 Duplicates: USM, US, F, NY, MO, K,
MICH.

Ageratina wurdackii R.M. King & H. Robinson,
Holotype, United States National Herbarium.



Ageratina cronquistii R.M. King & H. Robinson,
Holotype, United States National Herbarium.



UNITED STATES

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Ageratina macvaughii R.M. King & H. Robinson

Det. E. M. King and H. Robinson

1977

Holotype

PLANTS OF MICHOACAN, MEXICO

COLLECTED FOR THE HERBARIUM OF THE UNIVERSITY OF MICHIGAN
BY ROGERE McVAUGH, WILLIAM L. SISKIN AND M. E. STUBBS

Eunastorium cardiophyllum Rob.

Progenitor macvaughii, 3-6 km southeast of Acazotepec, Durango
Agave and nearby end of Apollito, in pine forest zone nearly on the
boundary between deep volcanic soils and shallow calcareous soils,
elevation 2000-2100 m.

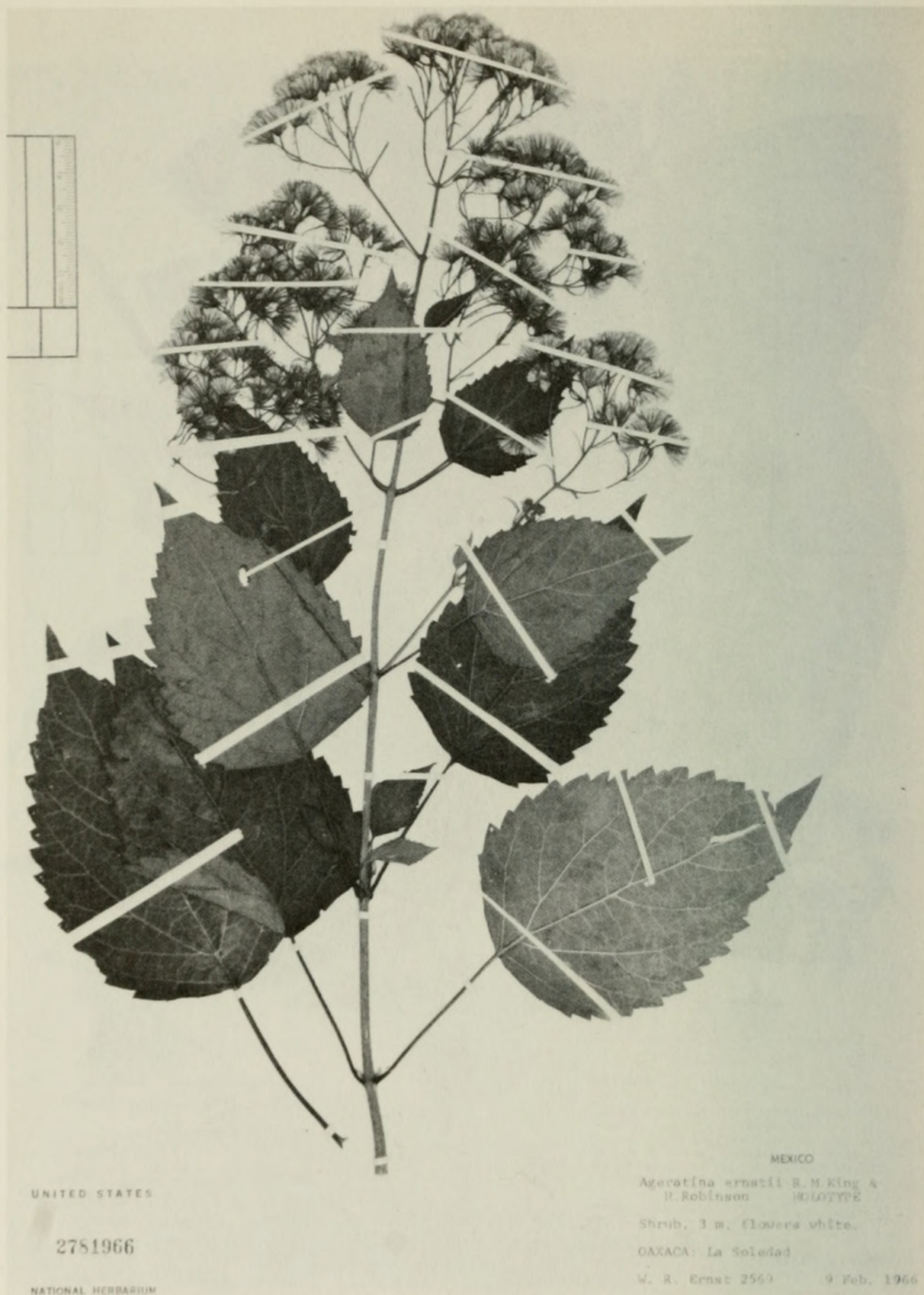
Abundant. Selected small specimens.

Plants up to 1.5 m high, viscid;
flowers white.

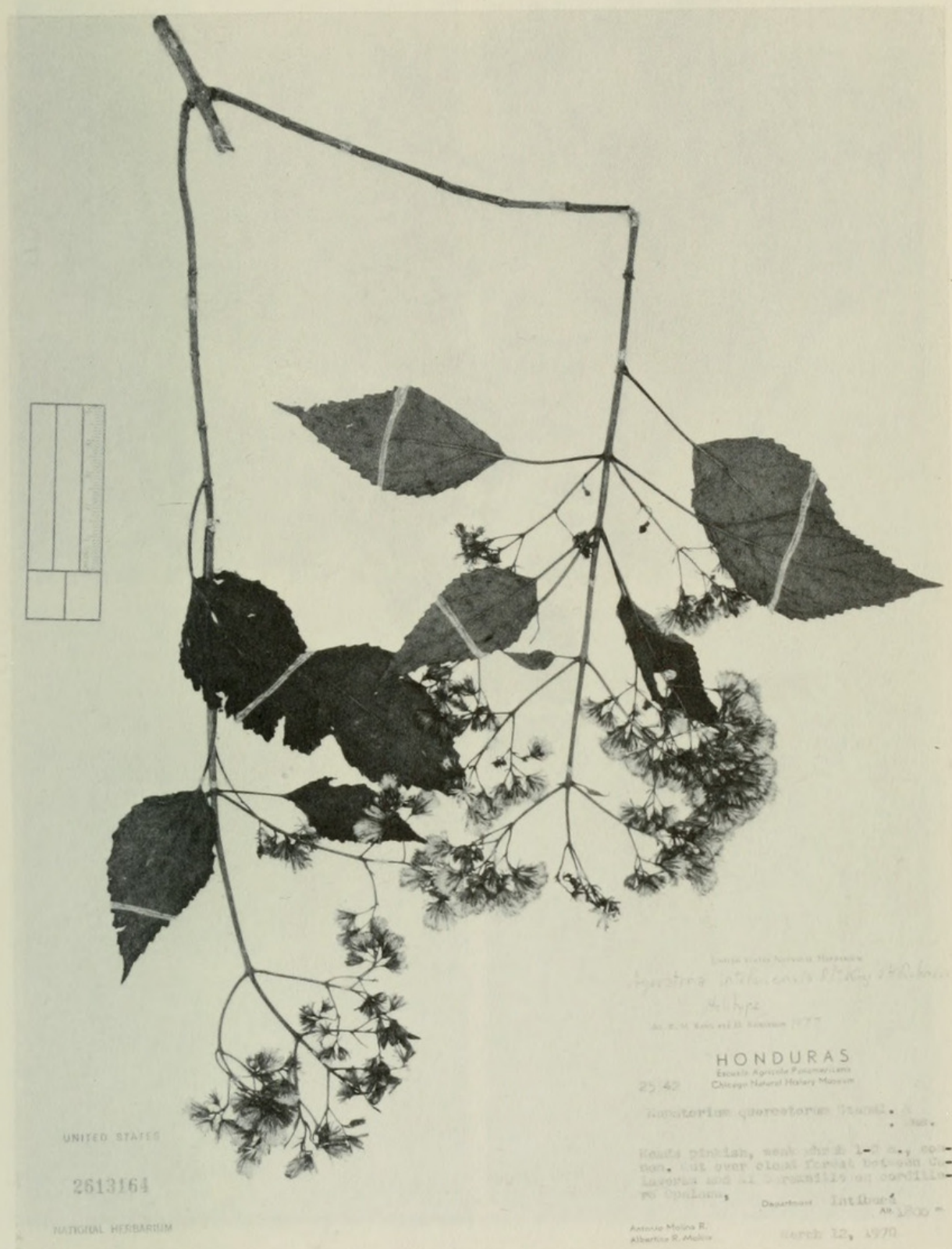
ROGERE McVAUGH, NO 24569

28 NOVEMBER 1970

Ageratina macvaughii R.M. King & H. Robinson,
Holotype, United States National Herbarium.



Ageratina ernestii R.M.King & H.Robinson, Holotype,
United States National Herbarium.



Ageratina intibucensis R.M. King & H. Robinson,
Holotype, United States National Herbarium.



UNITED STATES NATIONAL HERBARIUM
Ageratina salvadorensis R.M. King & H. Robinson
 Holotype
 det. F. M. Ewing and H. Robinson 12/7/74

EL SALVADOR
 CENTRO NACIONAL DE AGRONOMIA

Elfin woodland at summit of Cerro Santa Cristo,
 Dept. of Santa Ana, elevation about 7500 ft.
 March 19, 1959.

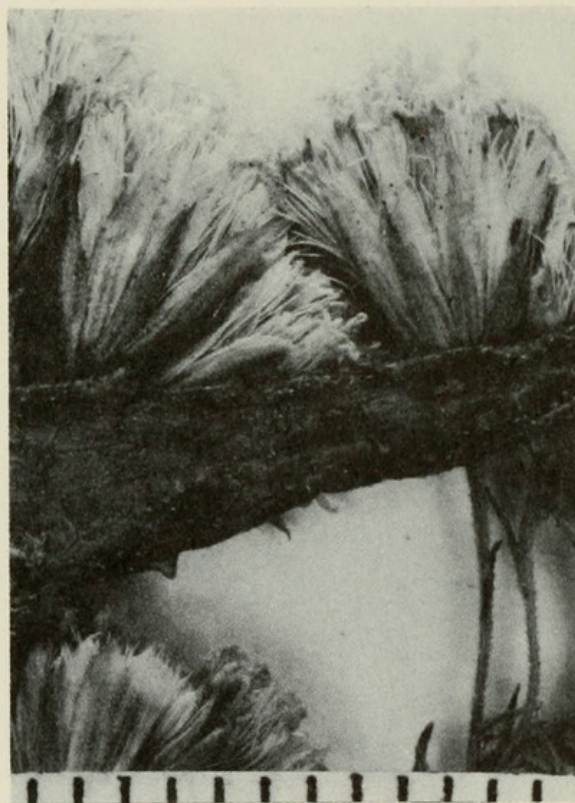
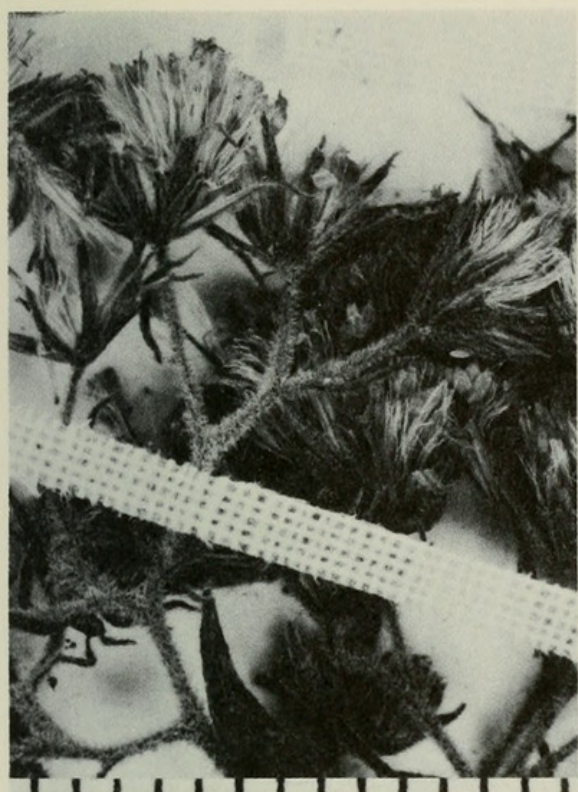
Eupatorium

Shrub, to about 6 ft. Flowers white, fragrant,
 common.

UNITED STATES
 2764649
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Paul H. Allen & Robert Amour 7284

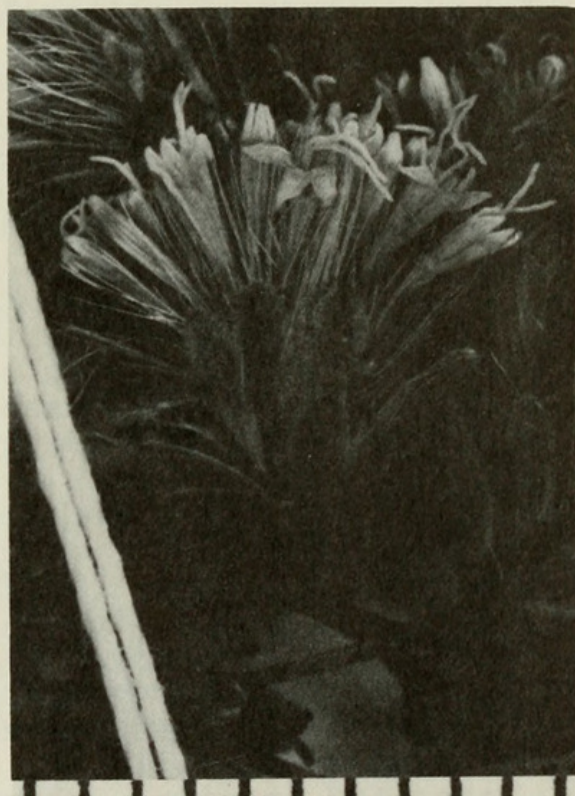
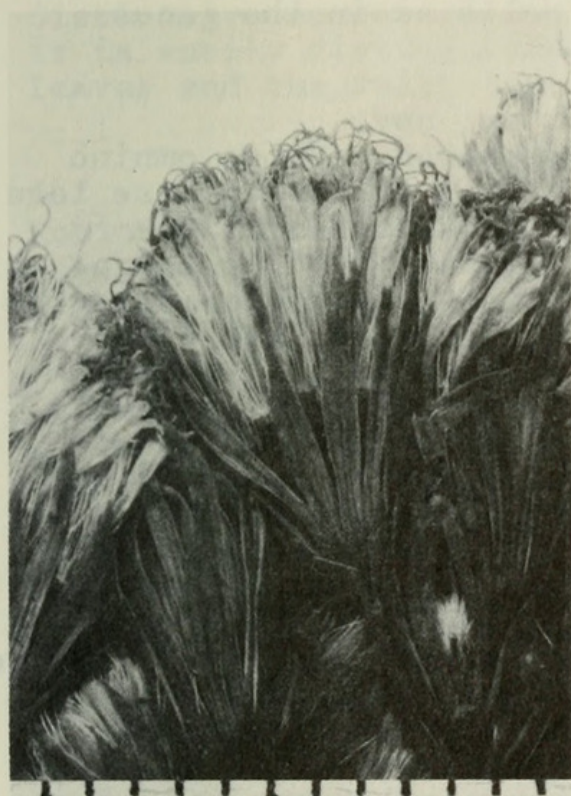
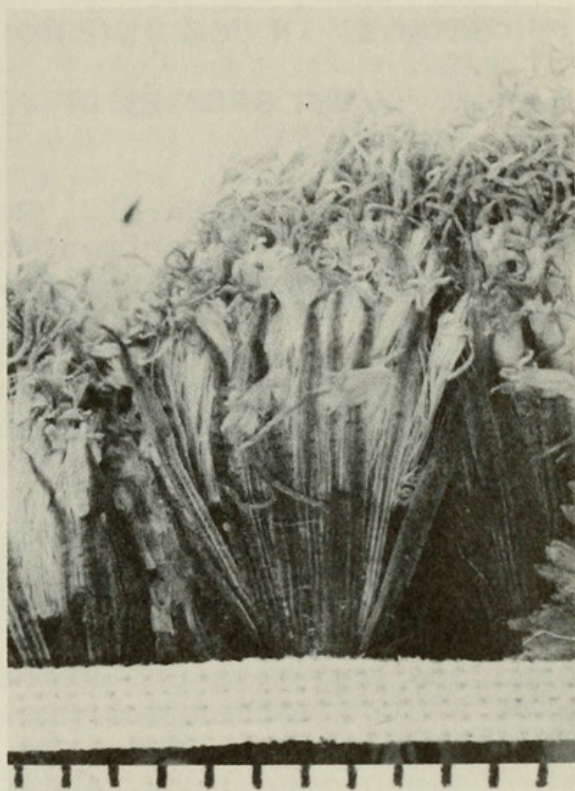
Ageratina salvadorensis R.M. King & H. Robinson,
 Holotype, United States National Herbarium.



Enlargements of heads of Ageratina. Top left: A. almedae. Top right: A. davidsei. Bottom left: A. peracuminata. Bottom right: A. salicifolia.



Enlargements of heads of Ageratina. Top left: A. sinaloensis. Top right: A. lopez-mirandae. Bottom left: A. wurdackii. Bottom right: A. cronquistii.



Enlargements of heads of Ageratina. Top left: A. macvaughii. Top right: A. ernstii. Bottom left: A. intibucensis. Bottom right A. salvadorensis.



King, Robert Merrill and Robinson, H. 1978. "Studies in the Eupatorieae (Asteraceae). CLXVIII. Additions to the genus Ageratina." *Phytologia* 38, 323–355. <https://doi.org/10.5962/bhl.part.23383>.

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