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Revision of the Genus *Baltimora* (Compositae, Heliantheae)[1]

TOD F. STUESSY
RESEARCH ASSOCIATE
FIELD MUSEUM OF NATURAL HISTORY
AND
ASSISTANT PROFESSOR OF BOTANY
OHIO STATE UNIVERSITY, COLUMBUS

Baltimora L. in the subtribe Melampodiinae has been regarded by most systematists during the past century as a distinct genus of either one or two species (Bentham, 1873; Bentham and Hooker, 1873; Baker, 1884; Hoffmann, 1890; Blake, 1930). My initial interest in the group was generated by discovering that the type specimens of two names originally described in *Melampodium* L. clearly belonged in *Baltimora* (Stuessy, 1968) but seemed quite morphologically distinct from the common species, *B. recta* L. Further investigations revealed that many generic and specific names have been associated with *Baltimora*, but these never have been sorted completely and placed in proper synonymy. In the present revision based mainly on herbarium material, recognition of two species in the genus is substantiated, generic relationships are clarified, and all names are ordered nomenclaturally.

TAXONOMIC HISTORY

The taxonomic history of *Baltimora* is surprisingly complex for a genus of such small size and conspicuous in the confusion has been the shifting of generic concepts and nomenclature. *Baltimora* was first described by Linnaeus in 1771. This name was widely used into

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the early nineteenth century despite the appearance of two superfluous names, *Niebuhria* Scop. in 1777 and *Timanthea* Salisb. in 1796, and the new genus *Fougeria* Moench in 1802. Lessing in 1830 added another genus, *Scolospermum*, which was described as differing from *Baltimora* mainly in having winged ray achenes. De Candolle (1836) continued to recognize two genera using Lessing's criteria, but rejected the name *Baltimora* in favor of *Fougerouxia* Cass. (variant spelling of *Fougeria*)[2] on the grounds that the species range does not extend into Maryland and therefore could not have been collected from Baltimore. On this basis, Linnaeus' name was considered inappropriate. Endlicher (1838) also recognized two genera, *Baltimora* and *Scolospermum*, but Steetz (in Seemann, 1854) clearly saw their congeneric nature, and he offered the name *Baltimora scolospermum* as the conglomerate label. Bentham and Hooker (1873) used the name *Baltimora* and considered as synonymous under it both *Fougeria* and *Scolospermum*. Baillon (1882) departed widely from previous treatments by lumping *Baltimora* with *Chrysogonum* L. and retaining the former taxon as a distinct section. In 1884, Baker recognized the single species, *Baltimora recta*, and this viewpoint has remained most widely accepted to the present date (e.g., Blake, 1930).

SPECIFIC CRITERIA

The recognition of two species in *Baltimora* in the present treatment, where other workers (including S. F. Blake, 1930) have recognized only a single taxon, demands explanation and substantiation. When only Mexican and Central American material of the genus is considered, two morphological units are seen clearly. *B. recta* has large heads with many disc and ray florets and exserted ligules (fig. 1). *B. geminata*, on the other hand, has smaller heads with few florets and very short ligules (fig. 2). However, in South America these distinctions break down. From Ecuador to Brazil specimens have intermediate head size, floret number, and ligule length. This intermediacy is dramatically emphasized by disclosing that in my

[2] De Candolle's choice of *Fougerouxia* instead of the earlier described *Fougeria* was a deliberate attempt (so stated in the Prodromus, 1836, p. 510) to conform to the correct spelling of the name of the man that the genus commemorated: A. D. Fougeroux of Paris. That Moench, himself, intended to honor Fougeroux also was stated clearly in his protologue, although he latinized the name as *Fougeria* (Elenchus, 1802, p. 243). According to the International Code of Botanical Nomenclature (Lanjouw et al., 1966; Art. 73, Note 5) the original spelling, *Fougeria*, must be retained, even though here as a synonym the adoption of the correct spelling is of little consequence.

initial attempt to sort the specimens into two groups, duplicate sheets of two collections ended up in both piles. To help clarify the confusion, detailed features of the heads were examined. The method utilized was to soak flowering material briefly in "Aerosol" (Ayensu, 1967) followed by dissection and mounting in Hoyer's solution (King and Robinson, 1970). This procedure proved very satisfactory and allowed parts of the florets to be examined with ease under the binocular as well as the compound microscope. As I studied these preparations, differences in features of the florets became immediately obvious. Although most of the structures of the heads are very similar, two conspicuous differences prevail which correlate with the megamorphic characters used initially to separate the Mexican and Central American material: (1) the shape of the anther appendages, and (2) the type of pappus of the ray florets. The anthers of *B. recta* are much larger than those of *B. geminata*, and the appendages are truncate (fig. 3) rather than rhombic (fig. 4). The pappus of the ray florets of *B. recta* is a crown of tissue (fig. 5), whereas in *B. geminata* the pappus is a collar of very short awns (fig. 6). Although these features are difficult to see with the naked eye, the taxa can be differentiated unequivocally by these characters.

The use of microcharacters to help distinguish species within *Baltimora* merits further comment, especially in light of the controversy centering around the purported efficacy of such features within the Compositae (Grashoff and Turner, 1970; King and Robinson, 1970). Although minute structures of the anthers and pappus in *Baltimora* have proven very useful taxonomically in the present study, I certainly do not believe that micromorphological characters are necessarily better than megamorphological, chemical, cytological, or other features. The time-honored axiom of systematic botany that ". . . all constant characters, of whatever nature, require to be taken into account in classifying plants according to their natural affinities" (Lindley, 1846; p. xxviii) is well founded. In *Baltimora*, microfeatures of the anthers and pappus help solve a particular taxonomic problem *in conjunction with* megamorphological and distributional considerations. The acknowledged efficacy of these microfeatures in this case, therefore, is not to be regarded as a triumph for "The New Synantherology" (King and Robinson, 1970), but rather simply an example of "The Good Synantherology"! This latter approach emphasizes a balanced consideration of all characters which should reflect most accurately the total genetic dif-

ferences among the populations within a particular taxon. Only by this method will a highly predictive system of classification result.

GENERIC RELATIONSHIPS

Superficially, *Baltimora recta* appears very similar to *Schizoptera peduncularis* (Benth.) Blake, also of the Melampodiinae. The resemblance is so striking, in fact, that at first glance I believed a Vienna isotype of the latter species (*Hartweg 665*) to be clearly *B. recta*. Upon closer examination, the monotypic *Schizoptera* is easily distinguishable from *Baltimora* by the former's dorsally compressed, lacerate-winged achenes (previously mentioned by Blake, 1916).

Hoffmann (1890) places *Baltimora* nearest *Dugesia* Gray and *Philoglossa* DC. His key to these genera is still adequate although the entire grouping is obviously heterogeneous. *Philoglossa* differs from all other genera of the Melampodiinae (including *Baltimora*) in having some of its disc florets fertile and in having deeply divided campanulate disc corollas. The flattened ray achenes and deeply dissected leaves of the monotypic *Dugesia* can be distinguished easily from the three-angled achenes and ovate, serrate leaves of *Baltimora*. In addition to morphological uniqueness, *Baltimora* differs cytologically from these presumptive allies. Only *B. recta* is known cytologically and it has been counted uniformly as $n = 15$ (Turner, Ellison and King, 1961; Turner and King, 1964). *Dugesia* and *Philoglossa* both have been counted as $n = 18$ (Diers, 1961; Turner, Beaman and Rock, 1961; Turner *et al.*, 1962).

Such morphological and cytological distinctions make difficult a determination of the close relatives of *Baltimora*. In my opinion, *Trigonospermum* Less. also of the Melampodiinae is most similar to *Baltimora*. The former genus is distributed in Mexico and also has been counted chromosomally (in two species) as $n = 15$ (Turner, Elli- and King, 1961; Turner and King, 1964). In addition, both genera are herbaceous annuals with triquetrous fruits. Despite these resemblances, taxa of *Trigonospermum* can be recognized most easily by the presence of abundant stipitate-glandular hairs on the peduncles.

TAXONOMIC TREATMENT

Key to Species

1. Capitula 7–22 mm. diam., 5–8 mm. tall, often in large panicles; ray florets 3–8, with ligules 3.8–5.5 mm. long; disc florets 16 or more; anthers 1.7 mm. long,

at apex truncate (fig. 3); pappus of ray florets a crown of tissue (fig. 5). ..... 1. *B. recta*

1. Capitula 5–11 mm. diam., 2.5–6 mm. tall, in few-flowered racemes or small panicles; ray florets 2–5, with ligules 1.3–3 mm. long; disc florets 2–12; anthers up to 0.8 mm. long, at apex with a rhombic appendage (fig. 4); pappus of ray florets a collar of very short awns (fig. 6) ..... 2. *B. geminata*

BALTIMORA L.

Baltimora L. Mant. 158. 1771. Type species: *Baltimora recta* L.

Niebuhria Scop. Introd. 134. 1777. *Nom. superfl.*

Timanthea Salisb. Prodr. 208. 1796. *Nom. superfl.*

Fougeria Moench, Meth. Suppl. 243. 1802. Type species: *Fougeria tetragona* Moench.

Fougerouxia Cass. Dict. Sci. Nat. 54:461. 1829. DC. Prodr. 5:509. 1836. Orthographic variant of *Fougeria* Moench.

Scolospermum Less. Linnaea 5:152. *t. 2. f. 19–31.* 1830. Type species: *Scolospermum baltimoroides* Less.

Scolopospermum [attributed to Less. in] Hemsl. Biol. Centr. Am. Bot. 144. 1881. Orthographic variant of *Scolospermum* Less.

Chrysogonum L. sect. *Baltimora* (L.) Baillon, Hist. Fam. Plant. 232. 1882.

Erect, annual, taprooted herbs. Branches terete, obtuse-angled when dry, yellow-green to purple. Leaves opposite, petiolate, at apex acuminate, 3-nerved from near base, at the margin serrate to biserrate. Capitula axillary and terminal, in few-flowered racemes or large panicles, subcylindrical to subglobose. Receptacle convex. Phyllaries of unequal length, in 3 series, narrowly ovate, acute-acuminate at the apex, with adaxial surface glabrous; outer bracts strigose, scarious at the margins toward base; inner bracts becoming less strigose and more scarious. Ligules yellow, elliptic, at apex emarginate, with undersurface strigose on veins with hairs 0.1–0.2 mm. long; tube glabrous, 0.2 mm. diam.; stigmatic lobes 2, 1 mm. long; pappus a crown of tissue or a collar of very short awns; fruits triquetrous, sometimes markedly winged, on sides smooth to tuberculate. Disc corollas yellow, glabrous, exserted above paleae at anthesis; throat funnelform; lobes partially reflexed, narrowly triangular, 0.2 mm. wide, pubescent on upper surface; anthers black, keeled, auriculate at base, exserted one-fourth of length from within corolla, with filaments conspicuously collared; style filiform, 0.1 mm. diam.; stigma yellow, undivided, 0.2 mm. diam.; pappus a crown of minute awns less than 0.1 mm. long; ovary filiform, 0.2 mm. diam., glabrous. Paleae conduplicate, lanceolate, scarious, glabrous, at apex acute, at apical margin ciliate with hairs 0.3 mm. long, with midrib weak. Chromosome number, $n = 15$.

1. **Baltimora recta** L. Mant. Plant. 288. 1771. TYPE: MARYLAND: near Baltimore, date and collector unknown, cultivated in bot. gard. Uppsala (Holotype, not located). Figure 1.

   Baltimora trinervata Moench, Meth. 592. 1794. *Nom. superfl.*, based on type of *Baltimora recta* L.

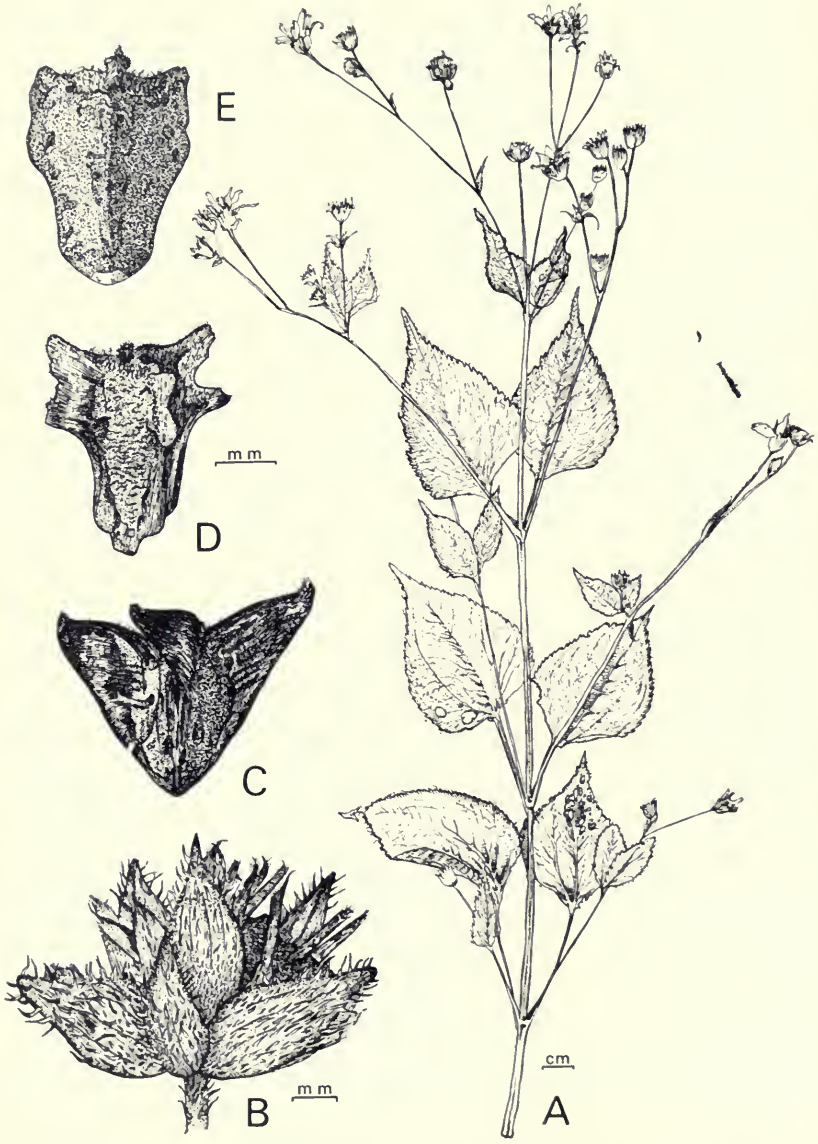

FIG. 1. *Baltimora recta*. **A**, habit (*Martínez-Calderón 1580*, MICH); **B**, head in fruit (*White 246*, US); **C** (*Greenman 5851*, MO), **D** (*Standley 21706*, GH), and **E** (*Standley 24357*, F), fruits (adaxial view and same scale).

Timanthea tristis Salisb. Prodr. 208. 1796. *Nom. superfl.*, based on type of *Baltimora recta* L.

Fougeria tetragona Moench, Meth. Suppl. 243. 1802. TYPE: source and date of collection unknown, growing in bot. gard. Marburg (Holotype, MB [destroyed; Stafleu, 1967]).

Baltimora alba Pers. Syn. 2:489. 1807. TYPE: locality, date, and collector unknown, cultivated in bot. gard. Triana (Holotype, not located). As the holotype is not in the collection of specimens from Paris sent to me on loan nor in the Lamarck or Jussieu herbaria (A. Lourteig, *per. comm.*), *B. alba* is included here in synonymy following the suggested disposition given in the Index Kewensis (Jackson, 1893).

Milleria alba Hort. ex Pers. Syn. 2:489. 1807. *Pro syn.*

Scolospermum baltimoroides Less. Linnaea 5:152. *t. 2. f. 19-31.* 1830. TYPE: MEXICO: "Santa Fe," Jul. 1828, *C. J. W. Schiede & F. Deppe 335* (Holotype, B; photograph of holotype, F! MICH! TEX! US!).

Baltimora erecta [attributed to L. by] Less. Syn. Comp. 220. 1832. Orthographic variant of *B. recta L.*

Scolospermum fougerouxiae DC. Prodr. 5:509. 1836. *Nom. superfl.*, based on type of *Scolospermum baltimoroides* Less.

Fougerouxia alba (Pers.) DC. Prodr. 5:510. 1836.

Fougerouxia recta (L.) DC. Prodr. 5:510. 1836.

Wedelia populifolia Hook. & Arn. Bot. Beech. Voy. 435. 1841. TYPE: NICARAGUA: Chinandega, Realejo, Feb. 1838, *A. Sinclair s.n.* (Holotype, K; fragment and photograph of holotype, US!).

Baltimora scolospermum Steetz in Seem. Bot. Voy. Herald 154. 1854. *Nom. superfl.*, based on type of *Scolospermum baltimoroides* Less.

Baltimora scolospermum Steetz in Seem. var. *panamensis* Steetz in Seem. Bot. Voy. Herald 154. 1854. TYPE: PANAMA: "in savanas," 1846–49, *B. C. Seemann s.n.* (Holotype, BM; isotype, GH!).

Baltimora scoloposperma [attributed to Steetz in Seem. by] Hemsl. Biol. Centr. Am. Bot. 2:144. 1881. Orthographic variant of *Baltimora scolospermum* Steetz in Seem.

Fougerouxia erecta [attributed to DC. by] Baker in Martius, Fl. Bras. 6(3):164. 1884. Orthographic variant of *Fougerouxia recta* (L.) DC.

Baltimora recta L. var. *genuina* Hass. Fedde Rep. Spec. Nov. 12:370. 1913. Based on type of *Baltimora recta* L.

Baltimora recta L. var. *scolospermum* (Steez in Seem.) Hass. Fedde Rep. Spec. Nov. 12:370. 1913.

Herb, up to 3 m. tall. Branches subglabrous at base, moderately to markedly strigose toward apex with hairs 0.3 mm. long. Leaves with petioles 0.8–7 cm. long, 0.2–1 mm. diam.; blades broadly to narrowly ovate, 2.5–15 cm. long, 1.5–12 cm. broad, at base truncate to shortly attenuate, with both surfaces weakly to moderately strigose with hairs 0.1–0.3 mm. long. Capitula in racemes or more often in large panicles, 7–22 mm. diam., 5–8 mm. tall. Peduncles 8–33 mm. long, 0.3–0.7 mm. diam., strigose with hairs 0.3 mm. long. Receptacle 1 mm. diam. Phyllaries 3–6, 3.5–6 mm. long, 1.7–2.2 mm. wide, with apical margin ciliate with hairs 0.3 mm. long; outer bracts weakly strigose on abaxial surface with hairs 0.3 mm. long. Ray florets 3–8; ligules 3.8–5.5 mm. long, 1.2–3.1 mm. wide; tube 1.2 mm. long; pappus a small crown or cup of tissue; fruits 2.4–3.2 mm. long, 1.6–1.9 mm. diam., at apex truncate and puberulent. Disc florets 16 or more; throat of corolla 1 mm. long, 0.7 mm. diam., with lobes 0.5 mm. long; tube 1 mm. long, 0.2 mm. diam.; anthers 1.7 mm. long, with appendage truncate; style 1 mm. long; stigma 1.2–2.2 mm. long; ovary 2.2–4 mm. long. Paleae 3.5–4.2 mm. long, 0.6–0.8 mm. wide. Chromosome number, $n = 15$.

Common Names.—"madre del maiz" (*Martínez-Calderón 1580*), "paira" (*Matamoros 2*), "tzalac-cat" (*Gaumer 1177*), "yas-soh" (*Stewart 136*).

Distribution.—Disturbed areas in various tropical habitats in Chiapas, Veracruz, and Yucatán, Mexico, and throughout Central America (fig. 7), also introduced to Java; 0–1,200 m.

Flowering Dates.—January–December.

Although *B. recta* is homogeneous morphologically with regard to most features, considerable variability prevails in the morphology of the mature ray achenes (fig. 1C–E). Such variation as seen in Figure 1D was, in fact, believed by Lessing in 1830 to indicate generic status (as *Scolospermum*). These representative fruit types illustrated here, however, are accompanied by all manner of intermediates and no particular form seems to predominate in a given geographic area. For this reason, no formal taxonomic importance has been attributed here to these achenial features.

The type locality of *B. recta*, as suggested by the generic name, is given by Linnaeus as being from Baltimore, Maryland. However,

this taxon is not represented by any other specimen from near this area nor for that matter from any part of the United States. Two possibilities come to mind in explanation of the peculiar cited locality of the holotype: (1) a labeling error may have occurred; or (2) the species may have appeared briefly in ballast dumps near Baltimore as is known to have happened in more recent times with other tropical denizens (Smith, 1867; Burk, 1877; Martindale, 1877; Reed, 1964).

The holotype of *B. recta* has not been located. It is not present in the Linnaean Herbarium (checked by Dr. W. T. Stearn) nor in the collection of specimens in the British Museum sent to me on loan. The type locality is of no help in deciding which species Linnaeus might have had before him. If the taxon were introduced on ballast dumps near Baltimore, Maryland, its origin likely could have been either from Mexico (suggesting *B. recta*) or from the West Indies (suggesting *B. geminata*). If a labeling error occurred, then either species could have been sent to Linnaeus from these same areas. Examination of other eighteenth century specimens in the herbarium of the British Museum reveals that plants collected by Houstoun in Veracruz and contained originally in the Miller Herbarium are of *B. recta*. Other specimens without locality data from the original Miller, Pallas, and Pavon herbaria are of *B. geminata*. Nomenclatural changes obviously will be necessary if *B. geminata* is discovered to be the holotype. Until additional information is available, however, the conventional nomenclature is best followed (as used in the present treatment).

Representative Specimens.—COSTA RICA. GUANACASTE: ca. 10 km. S of Cañas, *Godfrey 66961* (MO); 21.6 km. NW of Liberia, *Mori & Anderson 235* (BM, MO); between Sta. Rosa & Bolsón, *Pittier 2614* (G); Tempisque, *W. & H. Rowlee 190* (US); Bebedero, *Standley & Valerio 46691* (US). PUNTARENAS: between Palmar & Río Esquinas, *Allen 5273* (F, NY, UC, US); Surubres, pres de San Mateo, *Biolley 7019* (GH); 25 km. ESE of Puntarenas, *Holm & Iltis 279* (BM, NY, US); Barranca, *Matamoros 2* (F); near Puntarenas, *Maxon & Harvey 7859* (US); Isla de Chira, *Orozco 232* (F); Jesús María, *Stork 3320* (F, UC); Boruca, *Tonduz 4524* (GH). EL SALVADOR. AHUACHAPÁN: near Ahuachapán, *Standley 19931* (GH, US). MORAZÁN: ca. 15 km. NE of San Miguel, *Tucker 427* (F, UC, US), *521* (F, MICH, UC, US). SAN SALVADOR: San Salvador, *Calderon 778* (GH, MO, NY, US), *1833* (US), *2548* (F, US); San

Marcos, *Carlson 6* (F, UC); near San Salvador, *Standley 19397* (US); between San Martín and Laguna de Ilopango, *Standley 22483* (GH, US), *22594* (GH, US); San Salvador, *Velasco 8879* (GH, US), *8905* (GH, US). SANTA ANA: near Metapán, *Standley & Padilla 3268* (F); 4 miles SE of Santa Ana, *Stuessy 610* (TEX). SAN VICENTE: near San Vicente, *Standley 21706* (GH, NY, US). SONSONATE: Sonsonate, *Calderon 1694* (GH, MO, NY, US); Acajutla, *Eyerdam & Beetle 8737* (UC, US); near Sta. Emilia, *Standley 22136* (GH, US). GUATEMALA. ALTA VERAPAZ: near Sepacuité, *Cook & Doyle 106* (US), *320* (US); near Pampacché, *Standley 70620* (F), *70680* (F). BAJA VERAPAZ: ca. 15 miles S of Rabinal, *King 3362* (MICH, NY, TEX, UC, US). CHIQUIMULA: ca. 1 mile NW of Chiquimula, *Steyermark 30191* (F). EL PROGRESO: SW of El Progreso, *King 3253* (MICH, NY, TEX, UC, US). ESCUINTLA: San José, *Smith 2848* (F, US), *Standley 64099* (F). GUATEMALA: near Amatitlán, *Brenckle 47-244* (NY); between Amatitlán & Palín, *J. & M. Greenman 5851* (MO); ca. 36 km. S of Guatemala City, *King 3369* (MICH, NY, TEX, UC, US); Laguna Amatitlán, *Smith 2409* (F, US); Finca Bretaña, between Guatemala & Fiscal, *Standley 59768* (F, GH); Amatitlán, *von Tuerckheim 8704* (US). IZABAL: Los Amates, *Blake 7320* (US), Cristina, *7597* (US), Quiriguá, *7708* (US), *Standley 23821* (GH, US), *23830* (GH, US), ca. 15 km. N of Quiriguá, *24646* (GH, US), near Puerto Barrios, *24760* (GH, US). RETALHULEU: Champerico, *Standley 66644* (F, MICH, NY), 4 km. W of Retalhuleu, *87437* (F). SAN MARCOS: near Ayutla, *Standley 68809* (F). SANTA ROSA: Sta. Rosa, *Heyde & Lux 3420* (F), Malpais, *6165* (G, MO, NY, US); Cuilapa, *Johnston 1078* (F). SUCHITEPÉQUEZ: Patulul, *Shannon 590* (US). ZACAPA: Gualán, *Deam 246* (GH, MICH, NY, US); Zacapa, *Kellerman 7825* (F), *7827* (F, NY), *7854* (F, NY), *7933* (F); near La Fragua, *Standley 74814* (F); 2 miles S of Zacapa, *Steyermark 29295* (F). HONDURAS. ATLÁNTIDA: near Tela, *Mitchell 122* (F, US). CHOLUTECA: near Choluteca, *Standley 24357* (F), near Pespire, *27166* (F). CORTÉS: La Lima, *Johansen 51* (F, GH, US); Pimienta, *Molina 5639* (F); near La Lima, *Standley & Chacón 7220* (F); San Pedro Sula, *Thieme 5314* (F, GH, US), *5330* (F). EL PARAÍSO: Casitas, *Williams & Molina 14140* (F, GH). FRANCISCO MORAZÁN: Zamorano, *Glassman 1582* (F, NY), *Rodriguez 84* (F), *95* (F), *1041* (F), *3736* (F, GH), *Williams & Molina 10630* (A, F, MICH, MO, UC), *13392* (F, GH). VALLE: San Lorenzo, *Rodriguez 3463* (F, GH, US). YORO: 25 miles SE of Coyoles, *Molina & Becker 21* (F). JAVA. Eastern Java, *Backe s.n.* (US). MEXICO. CHIAPAS: 20 miles S of La

Trinitaria, *Breedlove 11798* (F, MICH, NY, US); Tapachula, *Fisher 35285* (F, MO, NY, US); Escuintla, *Hilerio s.n.* (ENCB); N of Arriaga, *King 3114* (MICH, NY, TEX, UC, US), Soconusco, *3127* (MICH, TEX), ca. 1 mile N of Suchiapa, *3431* (MICH, NY, TEX, UC, US); 5 km. N of Huixtla, *K. & E. Roe & Mori 830* (MICH). VERACRUZ: between Puente Nacional & José Cardel, *Gilly, Simpson & Dodds 94* (MICH); La Purga, *Greenman 226* (F, GH); 56 miles E of Orizaba, *Hunsaker s.n.* (TEX); Cotaxtla Experiment Station, *Janzen s.n.* (UC); Veracruz, *Johnson s.n.* (NY); 16 km. NE of Minatitlán, *King 1124* (MICH), ca. 1.5 miles W of Cuitláhuac, *2376* (MICH, TEX), ca. 24 miles SW of Veracruz, *2399* (MICH, TEX, US), *2400* (TEX), ca. 14 miles SW of Veracruz, *2405* (MICH, TEX), Boca del Río, *2692* (MICH, NY, TEX, UC, US), ca. 20 miles S of Acayucán, *2732* (MICH, NY, TEX, UC, US); Tlaliscoyan, *Martínez-Calderón 1580* (MICH); Veracruz, *Parry & Palmer 428* (GH, NY); 2 km. NE of Catemaco, *Rzedowski 26403* (ENCB); 1 mile N of José Cardel, *Stuessy 483* (TEX); Veracruz, *White 5081* (MICH). YUCATÁN: Progreso, *Gaumer 1177* (BM, GH, MO, US), Buena Vista Xbac, *1423* (F, MO), Chichankanab, *1476* (F); 10 miles N of Mérida, *C. & A. Lundell 8124* (F, GH, MICH, UC, US); 2 km. S of Tekax, *K. & E. Roe & Mori 1333* (MICH); Ticul, *Stewart 136* (GH). NICARAGUA. CHINANDEGA: near Chichigalpa, *Standley 11348* (F, UC). MANAGUA: Mangua, *Chaves 33* (US), *56* (US), *Garnier A-1360* (F, GH); between Managua and Asososca, *J. & M. Greenman 5639* (MO); 5 miles E of Managua, *Stuessy 622* (TEX). PANAMA. CANAL ZONE: Navy Reservation, N of Gamboa, *Dressler 3216* (MO); Sosa Hill, *Duke 4666* (MO); Madden Dam, *Dwyer 3051* (MICH); Gamboa, Naval Reservation, *Ebinger 486* (MO); Orchid Island, *Kenoyer 593* (US); Ancon Hill, *Killip 12001* (GH, US); Pedro Miguel, *King 5234* (TEX, UC, US), Fort Kobbe, *5239* (TEX, UC, US); near Madden Dam, *Lewis, Dwyer & Elias 9* (MO, NY, UC); Pedro Miguel, *Piper 5491* (US); near Culebra, *Pittier 2232* (US); between Corozal and Ancon, *Pittier 6739* (US); Madden Dam, *Porterfield s.n.* (NY), Vista del Mar, *s.n.* (NY); Sosa Hill, Balboa, *Standley 25278* (US), *26451* (GH, US); near Miraflores Lake, *White 246* (GH, MO). CHIRÍQUI: NE of Gualaca, *McCorkle C-42* (UC). COCLE: ca. 1 mile E of Antón, *Blum & Tyson 584* (MO). COLÓN: between Río Piedras and Puerto Pilón, *Lewis et al. 3208* (MO, UC); near Gatuncillo, *Piper 5632* (US). DARIÉN: 0–4 miles up Río Sabana from Santa Fé, *Duke 4144* (MO). HERRERA: Pesé, *Allen 799* (GH, MO, NY); Ocú, *Ebinger 1045* (MO). PANAMÁ: TTC Albrook Tower, *Blum 457* (MO); near Río Pacora

and Chepo Highway, *Duke 5920* (MO); near Panamá, *Hayes 676* (BM); Laguna de Portala, near Chepo, *Pittier 4588* (US); near Panamá, *Standley 26826* (US). VERAGUAS: hills W of Soná, *Allen 1066* (F, GH, MO); ca. 5 miles NE of La Mesa, *Blum & Tyson 638* (MO); 2–4 miles E of Santiago, *Duke 12369(1)* (MO); ca. 2 miles N of Atalaya, *Dwyer & Kirkbride, Jr. 7405* (MO, US), 12 miles from Santiago toward Divisa, *7448* (MO, UC).

2. **Baltimora geminata** (Brandg.) Stuessy, comb. nov. Figure 2.

Melampodium geminatum Brandg. Zoe 5:223. 1905. TYPE: MEXICO: Sinaloa, Cofradia [ca 30 miles E of Culiacán near Durango border], 24 Oct. [not 29 Oct.] 1904, *T. S. Brandegee s.n.* (Lectotype, UC!).

Melampodium bonairense Boldingh, Fl. Neder. West-Ind. Eil. 393. 1913. Fl. Dutch West Ind. Is. 2:107. *t. 9.* 1914. TYPE: DUTCH WEST INDIAN ISLANDS, Island Curaçao, Malpais, 28–30 Oct. 1909, *I. Boldingh M.14* (Holotype, U; paratypes *Boldingh 7401*, NY! P!, *Boldingh 5638*, NY!; fragment of P paratype, US!; photograph of K paratype, *Boldingh 7401*, US!).

Baltimora ovata Rusby, Descr. New Sp. S. Am. Pl. 151. 1920. TYPE: COLOMBIA: MAGDALENA, Santa Marta, "common on hot dry plains and rocky hills within 3 or 4 miles of the sea at Cienaga, Papare, Santa Marta, Braba, etc.," Sept.–Nov. 1898–1901, *H. H. Smith 536* (Holotype, NY!; isotype, BM! F! GH! MICH! MO! P! UC! US!; photograph and fragment of holotype, US!).

Herb, 0.3–3 m. tall. Branches glabrous at base, strigose toward apex with hairs 0.5 mm. long. Leaves with petioles 0.5–5.5 cm. long, 0.2–0.8 mm. diam.; blades ovate to narrowly ovate, 1.6–17 cm. long, 0.9–14 cm. broad, at base shortly attenuate, with both surfaces weakly to moderately strigose with hairs 0.5–1 mm. long. Capitula in few-flowered racemes or small panicles, 5–11 mm. diam., 2.5–6 mm. tall. Peduncles 5–35 mm. long, 0.2–0.5 mm. diam., strigose with hairs 0.5 mm. long. Receptacle 0.5 mm. diam. Phyllaries 5–8, 2.2–6 mm. long. 0.9–2 mm. wide, with apical margin ciliate with hairs 0.5 mm. long; outer bracts weakly to markedly strigose on abaxial surface with hairs 0.5 mm. long. Ray florets 2–5; ligules 1.3–3 mm. long, 0.6–1.6 mm. wide; tube 0.5–1 mm. long; pappus of many short awns up to 0.3 mm. long; fruits 2.3–3.1 mm. long, 1.8–2.0 mm. diam., at apex usually rounded and pubescent with hairs up to 0.2 mm. long. Disc florets 2–12; throat of corolla 0.6–0.8 mm. long, 0.4 mm. diam., with lobes 0.3 mm. long, at apex ciliate with hairs up to 0.1 mm. long; tube 0.6–1.0 mm. long, 0.3 mm. diam.; anthers 0.5–0.8 mm. long, with appendage rhombic, at apex acute; style 1–1.5 mm. long; stigma 0.3 mm. long; ovary 2.8 mm. long. Paleae 2.7–3.4 mm. long, 0.8 mm. wide. Chromosome number unknown.

FIG. 2. *Baltimora geminata*. **A**, habit; **B**, head in fruit; **C** (immature) and **D**, fruits (adaxial view and same scale). All *Curtiss 468* (P).

FIGS. 3–6. Stamens of disc florets and pappus of ray florets in species of *Baltimora*. **3** (*King 3369*, TEX) and **5** (*Chaves 56*, US), *B. recta;* **4** (*Steinbach 24798*, NY) and **6** (*Miers 3730*, US), *B. geminata*.

Common Name.—"Limoncillo" (*Partida 2010*).

Distribution.—Disturbed areas in savannas and tropical deciduous forests in the Mexican states of Colima, Jalisco, Nuevo León, Sinaloa, and Veracruz; in Cuba, Haiti, and Curaçao in the West Indies; and in Bolivia, Brazil, Colombia, Ecuador, Paraguay, Peru, and Venezuela in South America (figs. 7, 8); 0–200 m.

Flowering Dates.—August–April.

The occurrence of *B. geminata* primarily on geologically young islands and sea coasts far from the center of distribution of *B. recta* throughout Central America, suggests that the former taxon may have evolved from the latter. A single populational origin followed by introduction to several ports of entry may help explain the present scattered distributional pattern of *B. geminata*.

Representative Specimens.—BOLIVIA. COCHABAMBA: Yungas, *Bang 443* (F). SANTA CRUZ: La Paliza, *Steinbach 1797* (A, NY), Barbecho, *5360* (F, GH, MO, NY, US), near Buena Vista, *7044* (F), *24798* (NY). BRAZIL. GOIAS: Arraias, *Gardner 3845* (BM, F, NY, W). MARANHÃO: Maranhão [São Luís], *Gardner 6052* (BM, NY, W). MINAS GERAIS: Fajenda I. Terezinha, Ituiutaba, *Barroso 1628* (MO, US). PERNAMBUCO: Russinha [Rucinha], *Pickel 3992* (GH, NY). SÃO PAULO: Iacaré, Río de Janeiro, *Gardner 793* (BM, GH, W); Río Comprido, Río de Janeiro, *Miers 3730* (US). CUBA. ISLA DE PINOS: near Nueva Gerona, *Curtiss 468* (A, BM, F, GH, MO, NY, P, US). LAS VILLAS: Santa Clara, El Houdon, not far from Tguauojo river, *León & Clement 5417* (NY); Santa Clara, Lomas de

FIG. 7. Distribution of *Baltimora recta* (dots) and Mexican and West Indian distribution of *B. geminata* (triangles). Locality in Java representing recent introduction of *B. recta* is not shown.

FIG. 8. South American distribution of *Baltimora geminata*.

Banao, *Luna 844* (NY). CURAÇAO. Rooi Beru, *Arnoldo 1796* (US). ECUADOR. El Oro, Arenillas, *Asplund 15668* (LD, NY, US), Huaquillas, *15730* (NY), Santa Rosa, *15785* (NY); Manabi, El Recreo, *Eggers 15634* (F, US); Chanduy, *Spruce 6468* (BM). HAITI. Jean Rabel river near Bord de Mer, vicinity of Jean Rabel, *E. C. & G. M. Leonard 12546* (NY, US), *13019* (GH, MO, US). MÉXICO. COLIMA: Colima, *Palmer 158* (MICH, UC, US). JALISCO: hills between Bahía Navidad & La Manzanilla on Bahía Tenacatita, *McVaugh 20983* (MICH). NUEVO LEÓN: Tamaulipas state line on Victoria-Linares hwy, *Crutchfield & Johnston 5824* (MICH, TEX). SINALOA: Cofradia, *Brandegee s.n.* (GH, UC, US); Hacienda Labradas, near Labradas, *Ferris & Mexia 5066* (GH); Capulé, *Ortega 6050* (US), Culiacán, *6612* (US); Hacienda Oso, *Partida 2010* (US); 55 miles NW of Mazatlán, *Waterfall 12769* (MICH). VERACRUZ: Barranca de Panoaya, *Purpus 8232* (GH, NY, US). PARAGUAY. Between Río Apa & Río Aquidaban, Centurion, *Fiebrig 4585* (BM, GH, W); near Igatimí, *Hassler 5657* (GH, MICH, MO, NY, UC),

Sierra de Amambay, *10245* (BM, F, W). PERU. JUNÍN: La Merced, *Macbride 5457* (F, GH, US). TUMBEZ: plain SE of Hacienda la Choza, *Weberbauer 7713* (F, GH, US). VENEZUELA. FALCÓN: Peninsula de Paraguaná, Adícora, *Tamayo 919* (US). GUÁRICO: Corral Viejo, Valle de la Pascua, *Tamayo 4158* (US).

EXCLUDED SPECIES

Baltimora alata Meerb. Afb. D3. *t. 30.* 1775. TYPE: "in america septentrionali," date and collector unknown (Holotype, L? [location of original herbarium unknown; Stafleu, 1967]). The plant figured in the protologue shows close affinity in floral features with *Coreopsis* L. of the Coreopsidinae, but the large, ovate leaves and winged stem would be very unusual in that genus.

Baltimora monocephala Klatt, Ann. naturh. Hofmus. Wien 9:360. 1894. TYPE: MEXICO: México, Chapultepec, ca. 1860. *W. Knechtel 561* (Holotype, W!; photograph of holotype, F! MICH! US!). The holotype is an immature plant with only one partially opened head which precludes dissection and makes identification difficult. The specimen resembles *Calea elegans* DC. although the former has smaller buds, more ovate leaves, more pubescence on leaves and stems, shorter internodes, and is apparently an annual.

Baltimora scabra Pohl ex Baker in Mart. Fl. Bras. 6(3): 258. 1884. *Pro syn., Calea hymenolepis* Baker.

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