# MATERIALS TOWARD A MONOGRAPH OF THE GENUS LIPPIA. IV

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## LIPPIA GRAVEOLENS H.B.K.

Lippia berlandieri is based on three collections: (1) collected by Jean Louis Berlandier (no. 2252) between Santander and Vittoria, Mexico, along the Texas-Mexico border, in November, 1830, and deposited in the DeCandolle Herbarium at the Conservatoire et Jardin Botaniques at Geneva, where it was photographed by Macbride as his type photograph no. 33929, (2) collected by G. Andrieux (no. 166) near Oaxaca, Mexico, before 1835, and (3) collected by Carl August Ehrenberg (no. 720) on mountainsides near San Bartholomo, the last two originally deposited in the herbarium of the Botanisches Museum at Berlin, but now destroyed.

The type of Lantana origanoides was collected by Henri Guillaume Galeotti (no. 784), but Dr. Robyns has reported to me in a letter dated April 3, 1939: "We have been unable to find in our herbarium [Jardin Botanique de l'Etat, Brussels] the type specimen Galeotti 784 which is probably lost. But the specimen I am sending [Galeotti 756] has been authenticated by Martens & Galeotti." Lippia suaveolens is based on a collection made by Marcus Eugene Jones (no. 29373) at Laredo, Webb County, Texas, and deposited in the herbarium of Pomona College at Claremont, California.

It is worth pointing out here that the Lantana odorata of Aiton, referred to in the synonymy, is a synonym of L. involucrata L.; that of Linnaeus is L. involucrata var. odorata (L.) Moldenke; and that of Weigelt is Lippia alba (Mill.) N. E. Br. The Lippia geminata of H.B.K., of Humboldt & Bonpland, of Humboldt & Kunth, and of Kunth are also Lippia alba (Mill.) N. E. Br., while that of Millspaugh is Lantana microcephala A. Rich.

Lippia graveolens has been collected on mountains and low mountains, hills, limestone or limestone-shale hills almost destitute of soil, low or rocky hills, gravel or gravelly hills, "dry crevicious hills", steep or bushy hillsides, gravelly hilltops, mesas, deserts, rocky or dry rocky slopes, and brushy plains or woods. It grows in sand, rocky, clay, or gravelly limestone, or sandy soil, sandy loam, scrub, arid or open desert scrub, thickets and dense thickets, canyons, chaparral, cleared areas, gravel-pits, foothills, thick underbrush, dry creekbeds, thorn forests, lowlands, shrub grasslands on limestone mountains, and woodland associations with oak, pine, and juniper on mountain summits, among scattered oaks, at the base of rocky slopes, and along rivers and dry creekbeds, at altitudes of 50 to 3100 meters. In Texas it inhabits dry and rocky hills, valleys, and arroyos and in chaparral and open desert scrub from Brewster to Cameron northeast to Austin

and Houston Counties. In Yucatán it grows in rocky soil and on the slopes of hills and mesas. It grows from southern Texas south to Costa Rica, flowering and fruiting in every month of the year. In Texas it is said to bloom from March to December, while Palmer says that in Guerrero it flowers and fruits from October to March.

In Texas it was collected by Tharp & York in brushland along railroad cuts; Warnock & Surratt found it a "frequent shrub" in Terrell County, Runyon describes it as "frequent" and as "abundant in gravelly hills" in Starr County, while Hanson reports it "frequent in canyons" and "common in rocky valleys". In Brewster County Warnock says it is "infrequent along roads", "infrequent... in dry arroyos", "rare in ravines", and "a frequent shrub along highway". In Hidalgo County "a few plants" were observed by Cory. Rowell, Webster, & Barkley found it in "granitic soil on cliff of sandstone and soft granite," while Hinckley & Warnock report it "frequent and widespread in limestone soil on low sedimentary hills".

In Mexico it was collected by Waterfall in "clay valleys with acacias and other shrubs" in Coahuila; Hinton found "small colonies in rock-jumbled canyons" and Muller says it is an "abundant constituent of the desert shrubs in Larrea-Flourensia desert" in the same state. In Durango it occurs in "shrub-grassland on the south slope of limestone cerro" according to Gentry; in Zacatecas McVaugh describes it as "occasional in stream valley and nearby rocky oak-covered mountainside", while in the state of México it inhabits "deciduous spiny woods in barranca at edge of river" and "wet rocky spots in mixed woods" according to Matuda. Feddema describes it as an "occasional shrub in wooded areas in open sun in dry woodland with Acacia and Bursera" in Nayarit. Smith, Peterson, & Tejeda found it "in primarily thorn-scrub-cactus cover with evidence of former oak forest at high elevations along road, rock outcrops frequently calcareous" in Puebla, while in Tamaulipas, according to Crutchfield & Johnston, it lives on "limestone hills with short brush". Rzedowski found it in "ladera caliza con vegetación de Helietta parvifolia" and in similar localities with Agave striata. Standley found it "abundant on damp brushy slopes" in Guatemala. He reports (1938) that it is "cultivated frequently in gardens.....The aromatic leaves are used in Costa Rica for flavoring food, also medicinally." Calderón & Standley (1941) state that it is cultivated also in El Salvador.

E. F. Castetter, in a letter to me dated January 31, 1955, states that in 27 years of botanical collecting in New Mexico he has never seen this species in that state. It is possible that the two collections cited below from New Mexico are mis-labeled and may have come from adjacent western Texas.

The species is rather variable in leaf characters — Steyermark 29371, for instance, is a form with large, thin, hairy leaves; G. L. Fisher s.n. [Aug. 20, 1937] has the leaves dark, thin, and very hairy, and is certainly not very similar to Pringle 11083. It has been widely misidentified -- Millspaugh (1895) cites it as L. orig-

anoides, while Lundell (1937) cites it as L. alba. Standley (1930) is in error in stating that the L. geminata of Millspaugh (1900) and of Millspaugh & Loesener (1905) is L. graveolens. Actually, the specimens cited in both these references are Lantana microcephala A. Rich. His comment (1924), however, to the effect that it is very doubtful whether L. berlandieri differs in any important characters from L. graveolens, is quite true. Following Schauer, Standley distinguishes the two species in his key by the size of the leaves -- 3.5--5 cm. long in L. graveolens and only 1.5--3.5 cm. long in L. berlandieri. Examination of a large series of specimens from Texas, Mexico, and Central America has convinced me that the two taxa are conspecific.

Collectors differ considerably in their description of the flower color. The corolla is described as "yellow" on Muller 3002, Stanford, Retherford, & Northcraft 96, and Warnock & Surratt 9827; "yellowish" on Lundell & Lundell 9792; "cream-color" on Correll & Johnston 18041; "creamy-white with a yellow eye" on Lundell & Lundell 9906 & 12340; "cream changing to yellow in eye" on Sharp 441341; "cream-white with yellow throat" on Feddema 1247; "white with yellow eye" on Lundell & Lundell 9807 and McVaugh 17665; and "white" on Clover 39 & 1676, Frye & Frye 2353, Hinton 16571, 13061, 13162, & 13318, Lundell & Lundell 8803, Ripley & Barneby 13279, Runyon 1721 & 2538, Smith, Peterson, & Tejeda 3977, Standley 74025 & 74094, Steyermark 29371, Tharp, Johnston, & Turner 3509, and White 2072 & 2120.

Vernacular names recorded for the species are "ahuiyac xihuitl", "grégano", "hahauiyac xihuitl", "hierba dulce", "hierba olorosa", "Mexican oregano", "oreganillo", "oregano", "orégano", "oregano cimarron", "oregano cimarrón", "origano", "red brush", "romerillo de monte", "tabay", "tarbay", "té del país", "xakilche", and "yerba dulce". It should be noted that "té del país" is applied also to Phyla stoechadifolia (L.) Small, and "oreganillo" to Lippia cardiostegia Benth., L. myriocephala Schlecht. & Cham., and L. umbellata Cav. Standley (1930) states that the application of the names "tabay" and "tarbay" to this species is doubtful.

Calpouzos (1954) says "Oregano is becoming a popular herb in America. The botanical identity of the plants sold as oregano in the United States has been in doubt. Most of the plants belong to the genus Lippia, of the family Verbenaceae, and come from Mexico. The rest of our supply of this herb comes from Europe. These latter plants belong to the genus Origanum of the family Labiatae. Species in other genera are also called 'oregano', or some variation of this name, in many parts of the world. The term 'oregano' should not be used to refer to only a single plant species but rather to a number of species, all having in common a particular herb. flavor." The name "oregano", "oregeno", "origano", or "oragano" is applied also to Lippia affinis Schau., L. formosa T. S. Brandeg., L. fragrans

Turcz., L. micromera Schau., L. micromera var. helleri (Britton) Moldenke, L. origanoides H.B.K., L. palmeri S. Wats., L. palmeri var. spicata Rose, Lantana achyranthifolia Desf., L. involucrata L., L. trifolia L., Coleus amboinicus Lour., Hedeoma floribunda Standl., H. patens Jones, Hyptis albida H.B.K., H. americana (Aubl.) Urb., H. capitata Jacq., H. suaveolens (L.) Poit., Limnophila stolonifera (Blanco) Merr., Monarda austromontana Epl., Ocimum basilicum L., Origanum majorana L., O. vulgare L., Poliomintha longiflora Gray, and Salvia sp.

Gaumer (1907) states: "Lippia graveolens: stimulant, expectorant, and tonic. The fluid extract of Lippia is a diffusible stimulant which is employed with excellent carminitive effect against flatulency and nervous meteorism, is appreciated greatly in primitive fevers. It is also much used in the non-febrile state of cholera morbus and against all kinds of excessive fluxes, also against certain pernicious fevers. This is the plant of which an extract is used with much good effect in the treatment of debility and atony of the cerebral and spinal nerves, in the treatment of paralysis of the movement of voluntary muscles and organs of sense. It is employed with good effect against muscular debility and stupor of the senses consequent upon serious illnesses and the weakness which appears during convalescence; against headaches of debilitate, delicate, and nervous persons, eye-ache, vertigos observed in people dedicated to intellectual pursuits, and producing a happy cure for essential hypochondria. It has expectorant properties and effects changes in the bronchial mucous membranes. It is an excellent remedy for chronic bronchitis, and also for some catarrhal affectations of the respiratory system. Dose 1 to 5 drops." A pencilled note of the sheet of Gaumer 832 in the herbarium of the Chicago Natural History Museum adds "Extensively used as a condiment; also used as an anodyne." Standley (1924, 1930) confirms that the species is used in domestic medicine in Yucatán as a stimulant, tonic, expectorant, emmenagogue, and demulcent, especially in the treatment of cholera morbus, fevers, bronchitis, and catarrh, and that the aromatic leaves are used for flavoring food.

Material of L. graveolens has been misidentified and distributed in herbaria under the names L. alba (Mill.) N. E. Br., L. geminata H.B.K., L. lantanoides Coult., L. origanoides H.B.K., L. wrightii A. Gray, Lantana involucrata L., L. macropoda Torr., L. montevidensis (Spreng.) Briq., L. sp., Larrea tridentata DC., Tournefortia trichocalycina DC., Aloysia sp., and Satureja sp.

On the other hand, the V. H. Chase 7482, R. S. Ferris 5927, M. E. Jones 23563, and York s.n. [Brownsville, 3-19-1907], distributed as L. graveolens, are L. alba (Mill.) N. E. Br.; Bourgeau 1471 & 2983, Galeotti 752, and Edw. Palmer 1137 are L. hypoleia Briq.; Curran & Haman 606 & 966, Dawe 499, and Saer 62 are L. origanoides H.B.K.; Galeotti 795j is L. pringlei Briq.; Shreve

6150 & 6173 are Lantana velutina Mart. & Gal.; and Whitehouse s.n. [El Paso] is not verbenaceous, possibly a mint or a species of Eupatorium.

Tharp s.n. [6-16-1928] is a mixture with Aloysia wrightii (A. Gray) Heller, Frye & Frye 2353 is a mixture with Lantana macropoda Torr. and L. microcephala A. Rich., Warnock 831 is a mixture with Lantana macropoda Torr., and Steyermark 46285 is a mixture with Phyla scaberrima (A. L. Juss.) Moldenke.

The label on E. W. Nelson 6802, cited below, originally was inscribed "6201" in the Britton Herbarium. Mercedes Aguilar Hidalgo's name is often written "Mercedes Aguilar" or "Mercedes Aguilar H." E. P. Johnson 81 bears a label inscribed "Yucatan & Tabasco", but Millspaugh (1895) cites it as from Yucatán. The Ecology Class Univ. Texas s.n., cited below from Webb County, may actually have come from Zapata County — the label reads "Laredo--Zapata".

Glaziou (1911) cites his no. 9987 from Espirito Santo, Brazil, but this is obviously a misidentification. Gentry (1942) cites Shreve 6150 and 6173 from the Shreve Herbarium, but these collections are both Lantana velutina Mart. & Gal.

The records of L. graveolens from La Libertad, Guatemala, in my previous publications were based on Aguilar Hidalgo 40, which proves to have come from a locality "La Libertad" in El Petén.

In all, 440 herbarium specimens, including type or authentic material of most of the names involved, and 6 mounted photographs have been examined by me.

Citations: TEXAS: Austin Co.: Parry, Bigelow, Wright, & Schott 819 (Mi). Brewster Co.: H. C. Hanson 614 (N), 709 (Ka--60654); Hinckley 1555 [Warnock 461052] (N); Hinckley & Warnock 461031 (N, Ok), 461035 (N, Ok); E. G. Marsh 148 (G); B. H. Warnock 831, in part (Au), 13065 (Rf), W.831 (N), s.n. [Sperry 831] (Om); Warnock & Hinckley 3730 (N), 3739 (N), 461031 [Hinckley 1550] (Au, S), 461035 [Hinckley 1550] (Au, S), 461052 [Hinckley 1555] (Au). Cameron Co.: Nealley s.n. [Pt. Isabel, 1891] (Au); R. Runyon 154 (G); A. C. V. Schott s.n. [Rio Bravo del Norte] (C). El Paso Co.: C. Wright 459 (Ca--215389, G, T). Hidalgo Co.: Clover 39 (Mi, N); Correll & Johnston 18041 (Rf); Cory 51337 (Sm); J. A. Drushel 6323 (Ur); Lundell & Lundell 8803 (G, Ld, Mi, N), 9807 (Ld, N), 9906 (Ld, N); I. Shiller 736 (Au); Small & Wherry 11921 (N); Tharp & York 51-252 (St); Vogd s.n. [Pharr, June 18, 1947] (S); Mrs. E. J. Walker 22 (Au, G), s.n. [Rio Grande Valley, Feb. 2, 1942] (Au, Sm); M. L. Walker 104 (Au, S); Wiegand & Wiegand 1987 (It). Houston Co.: S. M. Tracy 9158 (Au, G, It, N, Tr, Tr, Tr, Tr, Up--50917, Ws). Jim Hogg Co.: Tharp 5904 (Au). Maverick Co.: Pringle 9034 (G, It, Me, Me, Me, Vt). Presidio Co.: Havard 24 (G). Starr Co.: Clover 1375 (Fs, N), 1676 (I, Mi, N); D. S. Correll 14895

(Rf); Innes 397 (G); Lundell & Lundell 9792 (N); A. R. Moldenke 182 (Fg); Ripley & Barneby 9047 (N); Rose & Russell 24363 (G, W—1369640); R. Runyon 1721 (Rr), 2538 (N, N); Tharp 5905 (Au, Au), s.n. [North of Rio Grande City, 6-16-28] (Mi, N); C. Wright s.n. [East side of Rio Grande, 1848] (G). Terrell Co.: Warnock & Surratt 9827 (Rf). Val Verde Co.: Cory 3416 (G), 19427 (G), 26273 (Tr), 38065 (N, N), s.n. [Langtry, July 1924] (Tr), s.n. [Langtry, Aug. 1924] (Tr); G. L. Fisher s.n. [Langtry, July 18, 1922] (Hp, Vt); Parks & Cory 19425 (Tr), 26719 (Tr); Rose & Fitch 17978 (N); E. D. Schulz 2012 (Wi). Webb Co.: Baird s.n. [Fall, 1936] (N); Cantu, Covell, & McCart 33 (Ok); Ecology Class Univ. Texas s.n. [Laredo-Zapata, 2.29.30] (Au); M. E. Jones 29186 (G, It, Po—199863), 29373 (Po—200131, Po—201279), s.n. [Laredo] (Po—199873); Martínez & Trevino 30 (Ok); Tharp, Johnston, & Turner 3509 (St). Zapata Co.: D. S. Correll 20782 (Rf); Cory 28139 (N), 35930 (N, N); Tharp 3697 (Au). County undetermined: Havard s.n. [1881] (Mi); Nealley 313 (Du—90916); Neatby s.n. [western Texas, Oct. 1890] (N). NEW MEXICO: County undetermined: LeRoy s.n. (Pa); C. Wright 1507 [Paneter Caves, N. Mex.] (G, T). MEXICO: Campeche: Perrine s.n. [Campeache] (T). Chiapas: Seler & Seler 3043 (Du—283955, G, Gg—245820). Chihuahua: Hewitt 337 (G); LeSueur 191 (Au, G), s.n. [Meoqui, 8/6/36] (Au, Ca—713074, G, Gg—320025); S. S. White 2063 (G, Mi), 2072 (Du—278210, Mi), 2120 (Du—287908, G, Mi). Coahuila: Aguirre 406 (N); Aguirre & Reko 37 (N); Herb. Inst. Biol. Univ. Nac. Mex. 1938 (Me), 7145 (Me); Hinton 16571 (G, N); I. M. Johnston 7038 (G); M. E. Jones 361 (Po—68825); Kenoyer & Crum 2622 (G, Mi), 3164 (Mi); E. J. Marsh 418 (St), 542 (Au); M. Martínez 7145 (Me); O. H. Muller 3002, in part (Ca—719562, Mi); E. W. Nelson 6802 (N); Edw. Palmer 362 (G), 370 (Ca—882481), 736 (A, G, G, N), 1025 (C, G, Io, Pa, Vt), 1026 (G, Pa); C. C. Parry 28 (G); Pringle 215 (G, Vt); Purpus 4520 (Ca—144791), s.n. [Torreon, 1902] (Ca—139674); Ripley & Barneby 13279 (N, N, N); Shreve 8420 (Fs), 8731 (Fs), 9413 (Ca—731698, Fs, Mi); Shreve & Tinkham 9579 (Ca—664998, G, Mi); A. H. Schroeder 31 (G); Stanford, Retherford, & Northcraft 96 (Ca—713862, Du—291288, G, N, Se—70494); Warnock & Barkley 14821m (Au); Waterfall 15801 (St); S. S. White 1938 (Mi, Oa—6688); Wynd & Mueller 87 (Fs, G, I, N, S, St). Durango: H. S. Gentry 6833 (Ak—22803, G, Mi, N); E. W. Nelson 4694 (G); Edw. Palmer 539 (Ca—104945, G, N, S, S). Federal District: Northcraft 7 (La, La); Rosenhouse 16146 (Kr). Guerrero: Degener & Degener 26216 (N, W); Hinton 6902 (A, K, N); Lemmon & Lemmon 203 (Ca—100954, G); H. E. Moore 5189 (Ca—918895, G, N); Edw. Palmer 167 (C, Ca—104927, G,

G); Pringle 9167 (G, Gg--421290, Mi, Vt); A. J. Sharp 441341 (N). Hidalgo: Gilly & Camp 20 (Mi, N); Herb. Inst. Biol. Univ. Nac. Mex. 7145 (Me); Kenoyer s.n. [Zimapan, 8-39] (Mi); Lundell & Lundell 12340 (Ld, Ld, Ld, Rf); Matuda 29564 (Z); Purpus 1414 (Ca--139656, G, N, Po--64344). México: Hinton 2655 (A, N, N), 5269 (G, N, N, N), 6370 (G, N); Matuda & al. 31723 (Ss), 31934 (Ss); Northcraft 7 (N). Michoacán: Hinton 13061 (Au, Du--290383, Mi, N, N, Rf, S, Ur), 13162 (G, Mi, N, N, Rf, S), 13318 (G, Mi, N, N, N, Rf, W--2020809). Morelos: Früderström & Hultén 189 (S); Moldenke & Moldenke 19831 (Es, Lg, Mg, Mr, N, No, Ot, Sm); Pringle 11083 (Cm, Fs, G, Gg--421291, It, Mi, N, Vt). Nayarit: Feddema 1247 (Mi). Nuevo León: F. A. Barkley 14496A (G); Fernandez C. & Barkley 14496a (Au, N); G. L. Fisher s.n. [Monterrey, July 14, 1924] (Cm, Du--175925, Fs, Vi); Frye & Frye 2353, in part (It, N, Pl--111102, Se--65594); Heard & Barkley 14547 (Au, N); Johnson & Barkley 16035M (Au, Ca--763284, G, N); Kenoyer s.n. [Sabinas Hidalgo, Sep. 15, 1937] (Fs); Mueller & Mueller 159 (Au, G, Me, Me, Ur); Pringle 1934 (Br, C, Ca--104917, G, Mi, Pa, S, Vt), s.n. [near Monterey, 4 August 1889] (Ca--104918); Quarles van Ufford 39 (Ut); Seler & Seler 1053 (G), 1092 (G); Shreve & Tinkham 9813 (Fs, G, Mi). Oaxaca: C. C. Deam 100 (G); Galeotti 756 (Br, Br, N-photo); A. Gonzalez 410 (G); V. Gonzalez 419 (G); H. S. McKee 11001 (Lw); E. W. Nelson 1210 (G), 1977 (G); Pringle 6258 (Br, C, Ca--104928, Cm, G, G, Gg--152308, Gg--162998, Io--38719, Me, Me, Me, Mi, Mm--15409, S, Vt); Rowell, Webster, & Barkley 17M490 (Mi, N); Seler & Seler 1391 (G); L. C. Smith 696 (G, Me). Puebla: Bravo Hollis 7145 (Me); Patoni 1007 (Me); Purpus 482 (Ca--139664), 3401 (Ca--139654); Rose & Gay 5930 (G); Smith, Peterson, & Tejeda 3977 (G, N, W--2397994). Quintana Roo: G. F. Gaumer 1527 (F--58325). San Luis Potosí: G. L. Fisher s.n. [Aug. 20, 1937] (Fs, N); Edw. Palmer 711 1/2 (Pa); C. C. Parry 711 1/2 (Io); J. Rzedowski 6479 (Au--170138), 6686 (Au--170117). Sinaloa: T. S. Brandegee s.n. [Cerro Colorado, Nov. 1, 1904] (Ca--104916); J. Gonzalez Ortega 6602 (Du--173304, G); M. E. Jones 23233 (Po--153925); Edw. Palmer 2771 (G). Tamaulipas: O. M. Clark 6641 (N); Crutchfield & Johnston 4986 (Au--175055); Kenoyer & Crum 3545 (G), 3644 (G); Edw. Palmer 520 (G); Perkins & Hall 3324, in part (It); Stanford, Lauber, & Taylor 2226 (Du--366137, N, N). Vera Cruz: Purpus 1915 (Ca--139655, G, N). Yucatán: G. F. Gaumer 832 (Br, Ca--446227, Du--207671, F--36635, G, Gg--160699, Mi, N), 1984 (F--58782, G), 1985 (Po--174974), 24308 (A, G, N, S); Gaumer & sons 832 (A, A, S); Gutierrez Rivas 32 (F--189451); E. P. Johnson 81 (C); C. F. Millspaugh 41 (F--195226). Zacatecas: F. E. Lloyd 97

(Ca--368992); R. McVaugh 17665 (Mi); J. N. Rose 2412 (G); Shreve 9400 (Ca--731697, Fs, G, Mi). State undetermined: Berlandier 832 [de Santander a Vittoria] (G, T), 2252 [Macbride photos 33929] (G, Kr--photo, N--photo, N--photo, T); Coulter 1162 (G); C. C. Deam s.n. [Salina Cruz, Dec. 21, 1898] (Mi); Gregg 443 (G), 496 (G); Haenke 1470 (N), 1583 (N); Lehmann B.T.818 (V); C. C. Parry s.n. [1852] (Io); Purpus 1181 (Ca--139657); Sessé, Mociño, Castillo, & Maldonado 2126 (Q), 2196bis (Q). GUATEMALA: El Petén: Aguilar Hidalgo 40 (F--713089, G, I, Mi, N, N); Steyermark 46285, in part (Mi). Zacapa: P. C. Standley 74025 (W--1842940), 74094 (N); Steyermark 29371 (F--1043423). BAY ISLANDS: Mugeres: G. F. Gaumer s.n. (Sg--66302). NICARAGUA: Grenada: Lévy 250 (Cb, Cb, Cp, Cp, N--photo, Z--photo). COSTA RICA: Alajuela: Brenes 23110 (N). Guanacaste: Brenes s.n. [1910] (N, Si). San José: H. Pittier 1681 (Br). CULTIVATED: Costa Rica: Brenes 12238 [117; 717] (N). El Salvador: Calderón 1177 (G).

LIPPIA GRISEBACHIANA Moldenke, Phytologia 1: 279. 1938.

Synonymy: Lippia lantanifolia Griseb., Abhand. Kaiser. Gesell. Wiss. Götting. 19: 242. 1874 [not L. lantanifolia F. Muell., 1868]. Lippia asperifolia argentiniensis Gill. & Schau. ex Griseb., Abhand. Kaiser. Gesell. Wiss. Götting. 19: 242, in syn. 1874. Lippia lontanifolia Griseb. ex Alvarez, Fl. Sant. del Estero 106, sphalm. 1919. Lippia lantanaefolia Griseb. ex Moldenke, Alph. List Invalid Names Suppl. 1: 14, in syn. 1947.

Bibliography: F. Muell., Fragm. 6: 151. 1868; Griseb., Abhand. Kaiser. Gesell. Wiss. Götting. 19: 242. 1874; Griseb., Pl. Lorentz. 194--195. 1874; Lorentz, Veg. Nordeste Prov. Entre Ríos, ed. 1, 150. 1878; Griseb., Abhand. Kaiser. Gesell. Wiss. Götting. 24: [Symb. Fl. Argent.] 277. 1879; Lillo, Fl. Tucuman 94. 1888; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 95. 1894; Kuntze, Rev. Gen. Pl. 3 (2): 252. 1898; Briq., Ann. Conserv. & Jard. Bot. Genèv. 4: 21. 1900; Sanzin, Anal. Soc. Cient. Argent. Buenos Aires 88 (i--iv): 102 & 103. 1919; Alvarez, Fl. Sant. del Estero 106. 1919; Stapf, Ind. Lond. 4: 125. 1930; Moldenke, Phytologia 1: 279. 1938; Moldenke, Prelim. Alph. List Invalid Names 31. 1940; Moldenke, Lilloa 5: 405 & 422--423. 1940; Moldenke, Phytologia 1: 504. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 43 & 95. 1942; Moldenke, Alph. List Invalid Names 31. 1942; Moldenke, Lilloa 10: 342--343. 1944; Moldenke, Phytologia 2: 83 & 107. 1945; P. I. Acuña, Catalog. Fl. Catamarq. 17. 1945; Moldenke, Alph. List Cit. 1: 73 & 95. 1946; E. J. Salisb., Ind. Kew. Suppl. 10: 134. 1947; Lorentz, Veg. Nordeste Prov. Entre Ríos, ed. 2, 150. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 14. 1947; Moldenke, Phytologia 2: 386. 1947; Moldenke, Lilloa 14: 33, 36, & 42. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 62. 1948; Moldenke, Alph. List Cit. 2: 368, 377, 378, 440--442, 535, 586, 600, & 620 (1948), 3: 661, 662, 673, 732, 736, 746, 804, 863--865, & 907--910 (1949),

and 4: 1080, 1089, 1091, 1092, 1148, 1168, 1172, 1203, & 1293. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 104 & 190. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 9. 1949; Troncoso, Darwiniana 10: 73--75, fig. 2. 1952; Moldenke, Résumé 125, 313, & 461. 1959; Moldenke, Résumé Suppl. 10: 6 (1964) and 11: 7. 1964; Moldenke, Phytologia 12: 47 & 61. 1965.

Illustrations: Sanzin, Anal. Soc. Cientif. Argent. Buenos Aires 88: (i--iv): 103. 1919; Troncoso, Darwiniana 10: 74, fig. 2. 1952.

Aromatic woody or subligneous shrub, 0.3--3 m. tall, branched; branches cylindric, rigid; branchlets subtetragonal, striate, with reddish-brown bark, pubescent or with thinly dispersed long white hairs, denser and shorter toward the apex, glabrescent in age; leaves decussate-opposite; petioles 0.5--1 cm. long; leaf-blades oval or rhomboid-lanceolate, usually 2--8 cm. long and 1--3 cm. wide, rarely to 13.5 cm. long and 6 cm. wide, broadly cuneate at the base and attenuate into the petiole, dentate along the margins with sharp broad teeth on the larger leaves, crenulate on the smaller ones, reticulate-veined, with short, rigid, callous-based hairs along the margins above, conspicuously venose and glandular-punctate beneath and pubescent on the venation, the venation impressed on the upper surface; inflorescence axillary, solitary, pedunculate, many-flowered; peduncles to 4.5 cm. long, slightly ampliate toward the apex, pubescent; outer bractlets lanceolate, 4--6 mm. long, 1.5--1.8 mm. wide, sparsely pubescent and ciliate, with a well-marked midrib and 2 or 3 visible lateral veins, the inner ones oval and shorter, 2.5--3.5 mm. long, subglabrous but conspicuously ciliate; calyx tubular, 2.5--3 mm. long, 2-lipped, glandular-punctate, hirsute on the lower half, pubescent on the upper half, the lips membranous, 1--3-dentate, densely ciliate, the teeth very short, irregular; corolla hypocrateriform, varying from purple, pale-lilac, or violet to pink, rose, bluish-white, white, or even yellowish, 2-lipped, the tube ampliate upwards, pubescent and glandular-punctate on the upper portion outside, the upper lip short, entire, the lower lip much larger and 3-lobed; stamens and pistil normal for the genus; fruit dry, oboval or oval, 1.8--2 mm. long, 1--1.2 mm. wide, smooth, included by the fruiting-calyx, separating into 2 cocci, convex on the back, flat on the ventral surface, the cocci 1-celled, 1-seeded; usually only 1 seed produced, oboval, with endosperm.

This species was based by Grisebach on two collections made by Paul Günther Lorentz, (1) in thickets at Cueste de San Javier, Tucumán, and (2) frequent in the valley of Granadillas, Catamarca, Argentina. Troncoso (1952) says of the endosperm "por lo menos hasta poco antes de la madurez una delgada capa de albumen rodea el embrión".

The species has been collected in fields, thickets, and dry open places, on banks and riverbanks, slopes, and mountainsides, in valleys, and below the rim of plateaus, at altitudes of 700 to 2800 meters, flowering from October to May, fruiting in March. Venturi 9432 has especially large leaves. The corollas are de-

scribed as "purple" on Bartlett 19619, Meyer 3090, and Rodriguez 1281, "violet" on Venturi 4290 & 7808, "pale-lilac" on Herb. Osten 12200, "pink" on Job 1375, "rose" on Olea 93 and Venturi 2689 & 9138, "yellowish" on Venturi 10493, "white" on Venturi 4296, and "white or bluish-white" on Fries 1. Possibly several color forms are represented here, but some of the variation is probably due to fading of the flowers with age or to differences in terminology on the part of the collectors. The L. lantanifolia var. crenata Griseb. is a synonym of L. junelliana (Moldenke) Troncoso.

Vernacular names recorded for the species are "cedrón del monte", "palo amarillo", "poleo", "salvia amarilla", and "salvia morada". The name, "cedrón del monte", is applied also to Aloysia gratissima (Gill. & Hook.) Troncoso, while "poleo" is also applied to L. affinis Schau., L. alba (Mill.) N. E. Br., L. integrifolia (Griseb.) Hieron., L. turbinata Griseb. and its varieties, and Mentha pulegium L.

Lippia grisebachiana is used as a blood-purifier in Argentina. Material has been misidentified and distributed in herbaria under the names Lantana balansae Briq., Cordia sp., and Verbena sp. On the other hand, the Venturi 815 distributed as L. grisebachiana is actually L. junelliana (Moldenke) Troncoso. T. Meyer s.n. [San Pedro de Colalao, 4-I-1940] is a mixture with Lantana aristata var. cabrerae Moldenke. Job 1375 was erroneously cited in Lilloa 5: 405 (1940) as Lantana balansae Briq.

In all, 76 herbarium specimens and 2 mounted photographs have been examined by me.

Citations: ARGENTINA: Catamarca: H. H. Bartlett 19619 (Mi, W--1907566); Castellanos s.n. [Gracián, Jan. 2, 1940; Herb. Mus. Argent. Cienc. Nat. 33876] (N), s.n. [Pomancillo, Jan. 11, 1940; Herb. Mus. Argent. Cienc. Nat. 33879] (N); Job 1375 (N); Jörgensen 1025 [Herb. Osten 11423] (Ca--192503, Ug, W--704751), s.n. [Andalgalá, Feb. 1916; Herb. Fac. Cienc. Med. B. Aires 1025] (N--photo, Sp--25778, Z--photo); Luna Risso 656 (N); Peirano s.n. [Londres, Jan. 22, 1934; Herb. Inst. Miguel Lillo 32845] (N), s.n. [Los Boganes, April 24, 1935; Herb. Inst. Miguel Lillo 32867] (N); Rodriguez Vaquero 902 (N, S); Schickendantz 21 (W--1233810); Schreiter 10550 [Herb. Inst. Miguel Lillo 32858] (N). Córdoba: Castellanos s.n. [Herb. Mus. Argent. Cienc. Nat. 31196] (N). Jujuy: Claren 11794 (S); Venturi 9432 (W--1591419), 10493 (S). La Rioja: Castellanos s.n. [Herb. Mus. Argent. Cienc. Nat. 27/2024] (N), s.n. [Herb. Mus. Argent. Cienc. Nat. 28/325] (N); Venturi 7808 (Gg--166712, S); Yepes s.n. [Herb. Mus. Argent. Cienc. Nat. 18855] (N). Salta: R. E. Fries 1 (N, S); Garolera & Romero s.n. [Cuesta del Obispo, 21/I/47] (N), s.n. [Cuesta del Obispo, 23/I/47] (N); Lorentz & Hieronymus s.n. [San José, II.73] (S); D. Rod-

riguez 1281 (N, N), s.n. [Herb. Mus. Argent. Cienc. Nat. 23770] (N); Venturi 6929 (W--1591500). Tucumán: Baer 98 (S); Bailetti 33 [Herb. Inst. Miguel Lillo 32399] (Vi); Bruch s.n. [Valle del Taff, 1908] (N, Ug); Castellanos s.n. [Herb. Mus. Argent. Cienc. Nat. 14815] (N); Krapovickas 3240 (N); Lillo 4304 [Herb. Inst. Miguel Lillo 32382] (Au, N, W--1802546), 7445 [Herb. Inst. Miguel Lillo 32393] (N); T. Meyer 3090 (N, N), 9766 (N, Vi), 11989 (N), s.n. [San Pedro de Calalao, 4-I-1940] (N); Monetti 1625 [Herb. Inst. Miguel Lillo 32353] (N), 1935 [Herb. Inst. Miguel Lillo 32388] (N); Olea 93 (S); R. Rocha 3825 (Ba); D. Rodriguez 346 [Herb. Inst. Miguel Lillo 32391] (N), s.n. [Herb. Mus. Argent. Cienc. Nat. 23891] (N); Schreiter 372 [Herb. Inst. Miguel Lillo 32622] (N), 969 [Herb. Osten 15087] (Ug), 2356 [Herb. Inst. Miguel Lillo 32624] (N, W--2407899), 4911 [Herb. Inst. Miguel Lillo 32340] (N), 9732 [Herb. Inst. Miguel Lillo 32828] (N, Ug--4950), s.n. [Gualinchay to Mal Paso, Dec. 1, 1917; Herb. Osten 12200] (Ug); Venturi 2689 [Herb. Osten 17264] (N, Ug, W--1343291, W--1591264), 4290 (Ca--342555, N, N, W--1591437), 4296 (W--1343316), 9138 (W--1591418), s.n. [Herb. Mus. Argent. Cienc. Nat. 27/1414] (N); E. Villa 661 (N).

LIPPIA HASSLERIANA Chod., Bull. Herb. Boiss., sér. 2, 2: 821. 1902.

Synonymy: Lippia hassleriana Briq. ex Moldenke, Suppl. List Invalid Names 5, in syn. 1941.

Bibliography: Chod., Bull. Herb. Boiss., sér. 2, 2: 821. 1902; Briq. in Chod., Pl. Hassler. 1 (9): 200. 1902; Briq. Ann. Conserv. & Jard. Bot. Genèv. 7-8: 305. 1904; Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 340. 1904; Briq. in Chod. & Hassler, Pl. Hassler. 2 (10): 489. 1904; Prain, Ind. Kew. Suppl. 3: 104. 1908; Moldenke, Lilloa 5: 423. 1940; Moldenke, Suppl. List Invalid Names 5. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 37, 41, & 95. 1942; Moldenke, Alph. List Invalid Names 31. 1942; Moldenke, Lilloa 8: 424. 1942; Moldenke, Alph. List Cit. 1: 26, 51, & 263. 1946; Moldenke, Lilloa 14: 42. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 63. 1948; Moldenke, Alph. List Cit. 3: 693 (1949) and 4: 1169. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 80, 99, & 190. 1949; Moldenke, Résumé 93, 116, 313, 417, & 461. 1959; Troncoso, Darwiniana 12: 257, 262, & 263, pl. 1, fig. 2. 1961; Moldenke, Phytologia 12: 24. 1965.

Illustrations: Troncoso, Darwiniana 12: 262, pl. 1, fig. 2. 1961.

Erect shrub or subshrub, 0.3--1 m. tall; stems woody, 2.5--3 mm. wide, scabrous with sparse upwardly curved bristle-like hairs; leaves decussate-opposite or ternate, sessile or subsessile, the blades coriaceous, broadly elliptic, 3.3--4.2 cm. long, 2.6--3 cm. wide, often apiculate at the apex, sparsely serrate above the middle along the margins, shiny and rugose above, paler and scarcely

or not at all rugose and setulose beneath, with 5 veins issuing from the base, 2 of which follow approximately the basal margin of the blade, the other 3 suberect but not extending a great distance from the base; inflorescence distinctly paniculate, ample, pedunculate; bractlets coriaceous, very squamose, slightly pilose on the back or glabrescent; calyx 2-alate, glandular, the wings membranous, vesiculate, long-ciliate, but less so than in L. hirta; corolla hypocrateriform, white or rosy-white.

This species was based by Chodat on two collections made by Emil Hassler -- in whose honor it was named -- in Paraguay: (1) no. 5685, collected in fields near Jepui-guazú in December of 1898 or 1899, and (2) no. 5924, collected in fields near the Río Capibary in December, 1900, both deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva, where the latter was photographed by Macbride as his type photograph no. 24653. Troncoso (1961) refers to the 5924 collection as lectotype and 5685 as syntype. The Briquet 1902 and 1904 references given in the bibliography above are often cited as "Plantae Hassleriana IX (1902) 200" and "X (1904) 489".

Chodat & Hassler (1902) say "Species affinis L. hirtae, differt foliis subtus et superne minus nervosis, minus plicatis, bracteis glabrescentibus pilis basi multo minus bulbosis, facie superiore foliorum laevi minus rugosa....A L. glabrescente Cham. et Schld. forma foliorum et eorum facie superiore nitida habituque sat distincta."

The species has been collected in fields and shrubby campos, flowering from November to March, fruiting in December. The corolla is described as "white" on Balansa 1030 and Hassler 5924, and as "rosy-white" on Hassler 5685. Briquet (1904) says "Type de premier ordre, rapproché par M. Chodat des L. hirta Cham. et L. glabrescens Cham. Ce rapprochement nous paraît fondé en ce sens que le L. Hassleriana appartient comme les deux espèces citées à la section Dipterocalyx à cause de son calice bicaréné. Mais il s'écarte d'ailleurs notablement par l'ensemble de ses caracteres de toutes les autres espèces de la section Dipterocalyx et rapelle plutôt de groupe Corymbosae de la section Euzapania." Troncoso (1961) says: "Especie descrita por Chodat basándose en los sintipos Hassler 5924 y 5685. Estudiados los ejemplares del Herbario de Ginebra, aunque ambos representan exactamente la especie, ha seleccionado como lectotipo, Hassler 5924, por hallarse en la colección de fototipos de la serie del Museo de Chicago, No. 24653.....Lippia hassleriana pertenece a la sección Dipterocalyx (Cham.) Schauer a causa de su cáliz 2-alado, con alas largamente ciliadas. Esta carácter considerado por Chamisso de gran valor taxonómico, pues le sirvió para crear el género Dipterocalyx (Linnaea 8: 241, lám. 7. 1832), no fue correctamente interpretado por su autor. Según la ilustración dada por Chamisso, las alas aparecen como un simple repliegue del cáliz, por el contrario se trata de dos alas membranosas, vesiculosas. Este cáliz vesiculoso

es probablemente un medio de diseminación ya que las semillas en su madurez permanecen encerradas por el mismo. Igual tipo de cáliz presenta L. hirta (Cham.) Sch. (Dipterocalyx hirtus Cham.) y L. sclerophylla Briq." She cites the following 20 specimens not as yet seen by me: PARAGUAY: Balansa 1030 (Cb, K, P); Fiebrig 6022 (Bm, Cb, K, Si); Hassler 5685 (Bm--cotype, Cb--cotype, K--cotype, P--cotype), 5924 (Cb--cotype, K--cotype, P--cotype), 8988 (Bm), 9168 (Bm, Cb, K); T. Rojas 4136 (Si); Sparre & Vervoorst 2118 (Ml).

In all, 17 herbarium specimens, including type material of both names involved, and 6 mounted photographs have been examined by me.

Citations: BRAZIL: Rio Grande do Sul: Bornmüller 372 (Cb, N, N--photo, Z--photo); Rambo 10004 (Rb). PARAGUAY: Balansa 1030 (Br, N, N), s.n. [1874--7] (S); Fiebrig 6022 (W--1159382); Hassler 5685 (Ca--935075--cotype, N--cotype), 5924 [Macbride photos 24653] (Ca--935076--cotype, It--photo of cotype, Kr--photo of cotype, N--cotype, N--photo of cotype, N--cotype, S--cotype, W--photo of cotype), 8988 (Ca--929001, N); T. Rojas 4136 (W--1444649).

LIPPIA HEDERAEFOLIA Mart. & Schau. ex Schau. in A. DC., Prodr. 11: 593. 1847.

Synonymy: Lippia hederifolia Mart. & Schau. ex Stapf, Ind. Lond. 4: 125. 1930. Lippia hederaefolia Schau. ex Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 37 & 95. 1942. Lippia hederaefolia Mart. ex Moldenke, Résumé Suppl. 10: 5, in syn. 1964.

Bibliography: Schau. in A. DC., Prodr. 11: 593. 1847; Schau. in Mart., Fl. Bras. 9: 250--251 & 307, pl. 41. 1851; Bocq., Adansonia 3: 244. 1863; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 95. 1894; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 151. 1895; Hayek in Fedde, Repert. Nov. Sp. 2: 87. 1906; Glaz., Bull. Soc. Bot. France 58, Mém. 3: 542. 1911; Luetzelburg, Estud. Bot. Nordéste 3: 224. 1923; Stapf, Ind. Lond. 4: 125. 1930; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 37 & 95. 1942; Moldenke, Alph. List Cit. 2: 486 (1948), 3: 689, 726, & 824 (1949), and 4: 1135 & 1301. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 80 & 190. 1949; Moldenke, Revist. Sudam. Bot. 8: 167. 1950; Moldenke, Résumé 93, 313, & 461. 1959; Rennó, Levant. Herb. Inst. Agron. Minas 150. 1960; Moldenke, Résumé Suppl. 8: 2 & 4 (1964) and 10: 5. 1964; Moldenke, Phytologia 12: 24, 145, & 166. 1965.

Illustrations: Schau. in Mart., Fl. Bras. 9: pl. 41. 1851.

Small shrub or subshrub, 0.5--1 m. tall, simple at the base, few-branched above; branches elongate, rather rigid, spreading, several mm. thick, foliose toward the apex; branchlets tetragonal, angular, margined, scabrous, foliose above; leaves small, decussate-opposite, very short-petiolate; leaf-blades ovate or subrotund, 6--12 mm. long, 4--10 mm. wide, only 1/4 as long as the internodes at the base of the branches to equaling them farther up, acute at the apex, entire at the base, triangular or

subcuneate at the base and narrowed into the petiole, incised-serrate and subrevolute along the margins with 2--4 lobe-like teeth on each side, strigose-scabrous above, pale and punctate beneath, pinnately veined, the venation impressed above, prominent and scabrous-pubescent beneath; peduncles filiform, tetragonal, rather rigid, patent, many times longer than the leaves, often more than 2.5 cm. long; heads exserted, corymbose, finally 1.6--2 cm. wide; bractlets large, showy, lilac or red, petaloid, involucrate, ovate, 8--12 mm. long, acute or rounded at the apex, 5--7-veined, reticulate, pubescent, ciliate, finally slightly enlarged; calyx about 3 mm. long, hispid, the lobes acute, 2-dentate; corolla large, showy, rose to violet or purple, hypocrateriform, pubescent on the outside, its tube about 8 mm. long, usually equaling the bracts, slender, almost regular, slightly incurved, slightly puberulent within, the limb rather large, about 7 mm. wide, very slightly puberulent above, obscurely pink-veined, yellowish in the throat, the upper lobe rounded and emarginate, the lateral lobes ovate, obtuse, the lowermost lobe obovate-subquadrate; stamens didynamous, inserted in the lower part of the corolla-tube; filaments short; anthers subdidynamous; style and stigma normal for the genus; fruit unknown.

This very distinct species was based by Schauer on several collections from Minas Gerais, Brazil. He says (1847) "In campis deserti Serro-Frio dictis prov. Minarum Brasiliae (Mart.! Pohl! Vauth. h. bras. 196)" deposited in the Munich and DeCandolle herbaria, and (1851) "Crescit in campis deserti Serro Frio prov. Minarum, ad S. Dominici praedium: Martius; inter Estrena et Vieira do Matto et Piedade: Pohl; prope Sabara prov. Minarum: Vauthier (n. 196)." He places it in his Subsection "B" of Section Rhodolippia. Briquet (1895) also classifies it in Subgenus Zapania, Section Rhodolippia. The J. E. Pohl 167, cited below, is probably the Pohl collection referred to by Schauer -- it was photographed by Macbride in the herbarium of the Botanisches Museum in Berlin as his type photograph no. 17512, but is now destroyed.

The species has been found on rocky campos and desert fields, at 1000 meters altitude, flowering from May to July, as well as in September and November. Luetzelburg (1923) records it from the caatinga in Bahia. The flowers are described as "purple" on Williams & Assis 7050, "violet" on Mendes Magalhães 1769 & 4308, and "rose with a yellow throat" by Schauer. Material has been misidentified and distributed in herbaria as L. diamantinensis Glaz. and L. gardneriana Schau.

Hayek (1906) points out that his L. reticulata differs from L. hederaefolia in having the leaves reticulate-venose and pilose beneath and the bractlets hirsute.

In all, 9 herbarium specimens and 4 mounted photographs, including phototype material of all the names involved, have been examined by me.

Citations: BRAZIL: Minas Gerais: Heringer 5293 (Z); Markgraf, Brade, Mello Barreto, & Mendes Magalhães 3273 [Herb. Jard. Bot.

Belo Horiz. 28448, in part] (N); Mello Barreto 12142 (Ja--32307); Mendes Magalhães 1769 (Be--14566), 4308 [Herb. Jard. Bot. Belo Horiz. 45089] (N); J. E. Pohl 167 [Macbride photos 17512] (Kr--photo of cotype, N--photo of cotype, N--photo of cotype, W--photo of cotype), s.n. [Herb. Caes. Vindob. 1847 comm.] (Br--cotype); Williams & Assis 7050 (G, N). State undetermined: G. Gardner 5124 (W--702440).

LIPPIA HERBACEA Mart. ex Schau. in A. DC., Prodr. 11: 589--590. 1847.

Bibliography: Schau. in A. DC., Prodr. 11: 589--590. 1847; Schau. in Mart., Fl. Bras. 9: 244--245. 1851; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 95. 1894; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 37 & 95 (1942) and [ed. 2], 80 & 190. 1949; Moldenke, Alph. List Cit. 3: 691 & 710. 1949; Moldenke, Résumé 93 & 461. 1959; Moldenke, Phytologia 12: 24 & 102. 1965.

Perennial herb or shrub, 1.2--2 m. tall; root perennial; stems many, herbaceous, erect, obtusely tetragonal, sulcate along the sides, paniculate above, hirtous or hirtellous; internodes more elongate upwards; leaves decussate-opposite or approximate, sessile, mostly deflexed, ovate-lanceolate, 5--6.5 cm. long, about 2.5 cm. wide, gradually reduced in size upwards, acute at the apex, crenate-serrate along the margins, penninerved, very rugose, very rough above and strigose-hirtous with short callose hairs, foveolate and hirtellous beneath, the reticulation covered with longer appressed hairs, the floral leaves (bracts) lanceolate, the uppermost ones smaller or even obsolete; panicle ample, centripetal, naked, spreading, pyramidal or subfastigiate, 45--60 cm. long, the branches slender or filiform, opposite, tetragonal, spreading, rigid, glandular-hirtellous, the sympodia 5--7.5 cm. long; peduncles opposite, spreading, tetragonal-filiform, glandular-hirtellous; heads small, tetraquetrous-ovoid; bractlets herbaceous, ovate, imbricate, acute at both ends, strigose-hirtous, equaling the corolla-tube; calyx very short, bifid, hirtous; corolla very small, rose-colored, about 1.5 mm. long, its tube purple, subinfundibular, ampliate above, slightly curvate, puberulent above, the limb rose-colored, the lobes subemarginate, hirtellous, the lowest wider; fruit normal for the genus, rather large, obcordate, separating into two halves.

This curious species was based by Schauer on several collections from Brazil: (1) by Carl Friedrich Philipp von Martius (no. 1705) in wet places near Mauritia vinifera on the campos near Salgado on the west bank of the Rio São Francisco, Minas Gerais, and (2) by Johann Emanuel Pohl also in wet places on the campo in Minas Gerais, deposited in the Munich and Vienna herbaria respectively. In his 1851 publication Schauer cites also unnumbered collections by Pohl from near Pillar in Goías and from elsewhere in that state. The Martius cotype in the Munich herbarium was photographed by Macbride as his type photograph no. 20328.

The species has been collected in fields and wet places on cam-

pos, flowering in April and August. In all, 4 herbarium specimens and 4 mounted photographs, including phototype material, have been examined by me.

Citations: BRAZIL: Minas Gerais: Macedo 2214 (N, S), 2299 (N), 2444 (W--2196854); Martius 1705 [Macbride photos 20328] (It--photo of cotype, Kr--photo of cotype, N--photo of cotype, W--photo of cotype).

LIPPIA HICKENII Troncoso, Darwiniana 10: 69--72, fig. 1. 1952.

Bibliography: Troncoso, Darwiniana 10: 69--72, fig. 1. 1952; G. Taylor, Ind. Kew. Suppl. 12: 82. 1959; Moldenke, Résumé Suppl. 7: 6. 1963; Moldenke, Phytologia 12: 148 & 170. 1965.

Illustrations: Troncoso, Darwiniana 10: 70, fig. 1. 1952.

Branched unarmed shrub; branches rather woody, subcylindric, striate, with gray bark; this year's branchlets straight, subtetragonal, sparsely glandular-puberulent, the indument formed of simple hairs with resinous glands visible only under a hand-lens; principal internodes to 3 cm. long; leaves decussate-opposite, short-petiolate; petioles 2.5--5 mm. long, glandular-pubescent; leaf-blades somewhat bicolored, oval or oblong, 1--2 cm. long, 0.4--1.2 cm. wide, subacute at the apex, truncate and broadly subcuneate at the base, finely and regularly crenate along the margins except at the entire base, trinerved or penninerved, rugose especially along the margins above and finely reticulate, densely glandular-punctate and short-pubescent above, opaque and incanous-pubescent beneath especially on young leaves, glandular-punctate between the pubescence; venation impressed above, prominent beneath; inflorescence axillary, on this year's branchlets, fasciculate; peduncles short, 4--9 mm. long; heads 2--6 per axil, oval, 5--6 mm. long, lengthening to 10 mm. during anthesis, 10--12-flowered; bractlets membranous, stramineous, decussate in 5 or 6 pairs, imbricate, equitant to the middle, broadly oval, 5--6 mm. long, 3--4 mm. wide, acute and conduplicate at the apex, reticulate-veined, pubescent and densely glandular-punctate; flowers small, 6--7 mm. long, sessile; calyx short-tubular, membranous, 2--2.5 mm. long, densely pubescent and with larger hirsute hairs interspersed, glandular-punctate, 2-lipped, easily separable into two halves, the lips bidentate; corolla hypocrateriform, white or yellow, slightly 2-lipped, the upper lip entire or bilobed, the lower lip 3-lobed, the tube subcylindric and glabrous at the base, ventricose and pubescent at the middle, ampliate and densely glandulose at the apex, glabrous inside, the limb crimped along the margins; stamens 4, didynamous, inserted in the upper half of the corolla-tube where this is enlarged; style terminal, short, included, to 3 mm. long; stigma lateral; ovary oval, 0.5 mm. long, glabrous; young fruit oboval, smooth, glabrous, with the base of the style persistent on its apex, about 1.5 mm. long (without the style) and 0.8 mm. wide, with a marked longitudinal line indicating the 2 enclosed cocci, one of which usually is aborted; cocci 1-celled, the pericarp subcoriaceous, dry, thin, smooth and shiny within; immature seeds ellipsoid, white, 1--2 mm. long, basifixed.

The type of this species was collected by Lorenzo Raimundo Paro-

di (no. 14864) at an altitude of 1100 meters at Diquelos Sauces, La Rioja, Argentina, on February 16, 1944, and is deposited in the herbarium of the Instituto Darwinion at San Isidro, Argentina. The species is named in honor of Cristóbal María Hicken, founder of the Instituto Darwinion. It greatly resembles L. pendula Rusby and L. salviaefolia Cham. Miss Troncoso cites also Castellanos s.n. from Guasayán, Villa La Punta, Santiago del Estero, deposited as sheet no. 47556 in the herbarium at Buenos Aires. She says: "El ejemplar de Santiago del Estero (BAB 47556), presenta algunas diferencias con el tipo, que señalo a continuación: Ramas más vigorosas con hojas más grandes, hasta de 4,3 cm de long. x 2,7 cm. de lat. (sin el pecíolo), éstas son de superficie menos rugosa; la pubescencia es más serícea, principalmente en las hojas superiores; las brácteas son más subuladas y plegadas en el ápice, hasta de 7,8 mm de long. No disponiendo de más material de dicha región queda para más adelante valorar estas pequeñas diferencias."

She also comments that "L. Hickenii pertenece a la Secc. Goniostachyum Schauer.....caractenzada por presentar dos o varios capítulos por axilla, breves, poco alargados, con brácteas decusadas, plegadas, carenadas e imbricadas en 4 hileres. El carácter de las brácteas plegado-carenadas es poco marcado en la nueva especie, aunque son plegadas en el ápice. Presenta gran semejanza, principalmente en los caracteres florales, con la especie boliviana, Lippia dumetorum Herzog. La comparación de Lippia Hickenii con el ejemplar tipo de L. dumetorum (Herzog 1851; L, S,) permite señalar las siguientes diferencias: hojas mayores, do 6--7 cm de long. x 2,5--2,8 cm de lat., capítulos espiciformes más delgados y alargados, dispuestos preferentemente en el ápice de las ramas dándole un aspecto apanojado y brácteas más pequeñas, de 3--4 mm de long. Otra especie vecina es L. sidoides Cham., pero esta especie no posee las brácteas soldadas características de L. Hickenii. Esta diferencia fundamental la he podido comprobar por comparación gracias a la gentileza del Dr. F. C. Hoehne, da São Paulo, quien me envió material de L. sidoides determinado por el Dr. Moldenke y procedente de su área general típica (L. sidoides Cham., Brasil, Sao Paulo, Itú, A. Russell No. 82, X-1897; São Paulo, Sorocaba, A. Lofgren No. 248, X-1887; dupl. SI.)"

LIPPIA HIERACIFOLIA Cham., Linnaea 7: 375. 1832.

Synonymy: Lippia hieracifolia Schlecht. ex Steud., Nom. Bot., ed. 2, 2: 54. 1840. Lippia hieraciifolia Cham. ex Schau. in A. DC., Prodr. 11: 588. 1847. Lippia alegrensis Briq. ex Augusto, Fl. Rio Grande do Sul 235. 1946. Lippia hieraciifolia Briq. ex Moldenke, Alph. List Invalid Names Suppl. 1: 14, in syn. 1947. Lippia hieraciifolia Cham. & Schl. ex Moldenke, Résumé Suppl. 1: 19, in syn. 1959.

Bibliography: Cham., Linnaea 7: 375. 1832; Steud., Nom. Bot., ed. 2, 2: 54. 1840; Walp., Repert. Bot. Syst. 4: 55. 1845; Schau. in A. DC., Prodr. 11: 588--589. 1847; Schau. in Mart., Fl. Bras.

9: 242--243. 1851; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 95. 1894; Briq., Arkiv Bot. Stockh. 2 (10): 20. 1904; Herter, Florul. Urug. 105. 1930; Herter, Revist. Sudam. Bot. 4: 185. 1937; Moldenke, Lilloa 5: 423. 1940; Moldenke, Suppl. List Invalid Names 5. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 37, 41, 43, & 95. 1942; Moldenke, Alph. List Invalid Names 31. 1942; Moldenke, Lilloa 10: 343. 1944; Moldenke, Alph. List Cit. 1: 12, 96, 192, & 195. 1946; Augusto, Fl. Rio Grande do Sul 235. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 13 & 14. 1947; Moldenke, Lilloa 14: 42--43. 1948; Moldenke, Alph. List Cit. 2: 358, 442, & 457 (1948), 3: 665, 689, 691, 703, 745, 816, 840, 848, 864, & 921 (1949), and 4: 1257. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 80, 100, 104, & 190. 1949; Rambo, Sellowia 6: 60 & 84. 1954; Moldenke, Résumé 93, 119, 125, 310, 313, & 461. 1959; Moldenke, Résumé Suppl. 1: 19. 1959; Troncoso, Bol. Soc. Argent. Bot. 9: 184. 1961; Moldenke, Phytologia 12: 24 & 84. 1965.

Dioecious suffruticose perennial; stems woody at the base, erect or ascending, mostly simple, slender, subterete, 0.5--1 m. tall, hirsute, leafy below, almost leafless and scapose above, issuing from an almost tuberous caudex, rarely with some axillary filiform branches above, racemose and strigose-canescent at the apex; principal internodes few, greatly elongated; leaves few, decussate-opposite, sessile, the blades obovate-oblong or lanceolate, 2.5--12.5 cm. long, 1.3--3.2 cm. wide, acute at the apex, entire below, crenate-serrate along the margins above, pennineryed, 3-plinerved on the larger ones, scarcely lineate above, strigose-hirsutulous on both surfaces, the upper ones distant and much smaller; peduncles axillary at the upper nodes, solitary, in 4's, or congested, longer than the floral leaves, about 1.3 cm. long, the upper ones shorter; heads globose, about 6 mm. wide, few, racemose or congested at the apex of the stem; bractlets ovate, almost 3 mm. long, acuminate at the apex, strigose-canescent on the back, closely imbricate, equaling the corolla; flowers functionally of two sexes; calyx densely spreading-lanate, almost equaling the corolla; corolla very small, yellow, hypocrateriform, its tube straight, slightly ampliate above, lightly puberulent in the throat, the limb very short, oblique, the lobes subequal, rounded.

This species was based by Chamisso on several collections made by Friedrich Sellow (nos. 1698 & 3260) in southern Brazil and deposited in the herbarium of the Botanisches Museum in Berlin, where they were photographed by Macbride as his type photograph number 17514, but are now destroyed. The type of L. alegrensis was collected by Eduard Martin Reineck and Josef Czermak (no. 66) at Porto Alegre, Rio Grande do Sul, Brazil, and is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques in Geneva; an isotype in the Munich herbarium was photographed by Macbride as his type photograph number 20320. The binomial appears as "Lippia alegrensis Briq. sp. nov." on the printed labels. Augusto (1946) says "segundo Bornmueller encontra-se a mesma espécie [L. hieracifolia] no herbario de

Reineck e Czermack sob Lippia alegrensis Briq.....Rio Grande do Sul, campos arbustivos 'forma proxima a Verbena: littoralis e bonariensis' confere com Lippia hieracifolia."

Schauer (1847) places the species in Section Zapania, Subsection Paniculatae. It has been found growing in bushy or shrubby fields, dry or open campos, dry grassy campos and grassy places in general, at an altitude of 200 meters, flowering from November to February and in May. Rambo encountered it in a region of 1.5 meters rainfall and a temperature variation of 5--35 degrees. Material has been misidentified and distributed in herbaria as Neosparton sp. and Verbena sp. On the other hand, the Pedersen 4326 distributed as L. hieracifolia is actually L. angustifolia Cham. The Leite 245 collection cited below is marked "Eugenio 245" on the original label, but was collected by Padre José Eugenio Leite.

Augusto (1946) cites an unnumbered Herter collection from Rivera, Uruguay, and one of Borrmüller from "Pôrto Alegre, Tristeza, nos prados". In all, 30 herbarium specimens and 11 mounted photographs, including type or phototype material of all the names involved, have been examined by me.

Citations: BRAZIL: Rio Grande do Sul: Costa Sacco 331 [Herb. Hort. Bot. 1068] (N); Emrich 28682 (Rb), s.n. [Herb. Herter 96646] (N); Leite 245 (N); Lindman A.1187 (N, S); Malme 590 (S), 590a (S); Moldenke & Moldenke 19687 (N); Rambo 9145 (Rb), 27010 (S), 38681 (N), 51343 (W--2102004); Reineck & Czermak 66 [Macbride photos 20320] (Kr--photo, N--photo, S, W--photo). State undetermined: Sellow 1698 [Brasil meridionali; Macbride photos 17514, in part] (Kr--photo of cotype, N--photo of cotype, W--photo of cotype), 3260 [Brasil meridionali; Macbride photos 17514, in part] (Kr--photo of cotype, N--photo of cotype, W--photo of cotype). URUGUAY: Arechavaleta 13 (Cb, N--photo, Ug, Z--photo), s.n. [Tacuarembo, Nov.] (Ug); Herb. Herter 94103 (N); Legrand 3963 (Ug), 4128 (Ug); Pintos s.n. [Herb. Osten 3749] (Ug). ARGENTINA: Corrientes: Castellanos s.n. [Herb. Mus. Argent. Cienc. Nat. 34483] (N). Misiones: Ekman 2009 (N, S), 2010 (S); D. Rodriguez 773 [Herb. Inst. Miguel Lillo 31582] (N); Ruiz Huidobro 5301 (N, Si), 5556 (N); E. J. Schwarz 3959 (N).

LIPPIA HIRSUTA L. f., Suppl. Pl. 288. 1788.

Synonymy: Lippia hirsuta Mutis ex Spreng. in L., Syst. Veg., ed. 16, 2: 752. 1825. Lippia sphacelifolia Benth., Pl. Hartw. 245. 1846. Lippia hirsuta β sphacelifolia (Benth.) Kuntze, Rev. Gen. Pl. 3 (2): 252. 1898. Lippia hirsuta L. ex Moldenke, Résumé Suppl. 9: 4, in syn. 1964.

Bibliography: L. f., Suppl. Pl. 288. 1788; Spreng. in L., Syst. Veg., ed. 16, 2: 752. 1825; Steud., Nom. Bot., ed. 2, 2: 54. 1840; D. Dietr., Syn. Pl. 3: 599. 1843; Walp., Repert. Bot. Syst.

4: 54. 1845; Benth., Pl. Hartw. 245. 1846; Schau. in A. DC., Prodr. 11: 580. 1847; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 95. 1894; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 151. 1895; Kuntze, Rev. Gen. Pl. 3 (2): 252. 1898; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 31, 32, 95, & 96. 1942; Moldenke, Alph. List Cit. 1: 131—135, 194, & 222. 1946; Moldenke, Phytologia 2: 334. 1947; W. H. Hodge, Revist. Fac. Nat. Agron. 7: 313. 1947; Daniel, Verbenac. Cent. Antioq. 4. 1947; Moldenke, Alph. List Cit. 2: 352, 410, & 611 (1948), 3: 974 (1949), and 4: 1001, 1074, 1078, & 1215. 1949; Moldenke, Phytologia 3: 141. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 60, 63, 162, & 190—191. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 10. 1949; Moldenke, Résumé 67, 71, 220, 461, & 462. 1959; Moldenke, Résumé Suppl. 8: 1, 4, & 5 (1964) and 11: 4, 5, & 7. 1964; Moldenke, Biol. Abstr. 45: 7026. 1964; Moldenke, Phytologia 12: 23 & 77. 1965.

Shrub or small tree, 1—16.5 m. tall, hirsute, with spreading top and good wood, the trunk 10—25 cm. in diameter; bark gray, rough, much fissured, shreddy, cracking off in thick plates; stems tetragonal; branches somewhat drooping, tetragonal, canescent-hirsute; leaves decussate-opposite, petiolate, harsh, pleasantly scented; petioles short, about 1.2 cm. long; leaf-blades firmly chartaceous or papyraceous, dark-green above, dull- or light-green beneath, usually nigrescent in drying, oblong or broadly oblong to oblong-lanceolate, 7.5—13 cm. long, 2.5—4 cm. wide, acuminate at both ends, serrate or serrate-crenate along the margins, cuneate or attenuate into the petiole at the base, bullate and reticulate-rugose and pilose or pilose-hirtous to hirtous above, usually densely tomentose or tomentose-pubescent and incanous or subcanescent beneath, especially hirsute on the prominent buff venation; inflorescence axillary and subequaling the leaves or terminal and elongated into a branched fastigiate many-headed panicle, the axillary ones single or paired, unequal, and longer pedunculate; peduncles short, axillary, numerous, canescent-hirsute; pedicels about 1.2 cm. long, dull pale-green; heads pedicellate, hemispheric or ovate to subglobose or depressed, in clusters of 2 or 3, large, the size of a large pea [Pisum sativum], 6—8 mm. wide, very densely canescent-hirsute or softly villous, subtended by a pair of small bracts; bractlets membranous, light-green or dull pale-green, ovate or broadly ovate to broadly rhomboid, small, stipitate, slightly shorter than or equaling the flowers, imbricate, acute to very short-acuminate or obtuse at the apex, cuneate at the base, hirtellous on the back, long-ciliate along the margins, the larger ones about 5 mm. long and wide; flowers minute; calyx bifid, compressed, about 2 mm. long, slightly shorter than the corolla, bifariously lanate or very pilose, the hairs on the keel greatly surpassing the margins of the bractlets, ciliate at both ends, with a glabrous anterior disk, the anterior side deeply bifid, the posterior side split to below the middle, the lobes carinate, entire or 2-dentate at the apex, densely long-pilose on the back; corolla very small, hypocrateriform or funnelform, white, scarcely more than 2 mm. long, the tube

short, scarcely surpassing the calyx, green within, lightly pilosulous at the apex on the outside, the throat broad, the limb 4-lobed; filaments short, inserted in the corolla-throat; fruit obovate, shorter than the mature calyx, compressed, 2-parted, smooth; cocci coherent.

The type of this puzzling species was apparently collected by José Escallón (no. 4) in Antioquia, Colombia, but was transmitted to the younger Linnaeus by Mutis and is deposited in the herbarium of the Linnaean Society in London. The type of L. sphacelifolia was collected by Carl Theodor Hartweg (no. 1354) "prope Pagum Pacho" near Bogotá, Cundinamarca, Colombia, and is deposited in the Bentham Herbarium at the Royal Botanic Gardens, Kew. I am not completely certain that my interpretation of L. hirsuta and its synonymy is the correct one. The type should be re-examined and compared with the types of L. sphacelifolia Benth., L. moritzii Turcz., L. schlimii Turcz., and the taxa whose names are given in their synonymy. It should be noted here that the L. hirsuta α vernonioides (Cham.) Kuntze and L. hirsuta f. vernonioides (Cham.) Kuntze are synonyms of L. vernonioides Cham., a distinct species, while L. hirsuta var. glabrescens Moldenke is now regarded as L. schlimii var. glabrescens (Moldenke) Moldenke.

The original description of L. hirsuta by the younger Linnaeus is: "Hirsuta, foliis oblongis latis rugosis serratis subtus tomentosis, paniculis axillaribus, capitulis ovatis. Habitat in America. Mutis. Caulis tetragonus, hirsutie canus. Folia opposita, petiolata, oblonga, longa, serrata, rugosa, supra pilosa, subtus tomentosa cana. Pedunculi axillares, plures, elongati in paniculam, ramificantes. Pedicelli terminantes in capitula ovata, bracteis binis suffulta. Flores minuti, albi." Bentham (1846) says of his L. sphacelifolia: "Affinis L. vernonioidi Cham. et L. callicarpaefoliae, Humb. & Kunth."

Schauer (1847) places L. hirsuta in Section Dipterocalyx. He includes Lippia pallescens Benth. in its synonymy, based on Hartweg 1355 from Bogotá, Cundinamarca, Colombia, but I cite this binomial in the synonymy of Lantana canescens H.B.K. He cites only this collection and Hartweg 1354 for L. hirsuta.

Cuatrecasas describes our plant as "fruticuletum bejucoso; hoja verde grisacea o verde amarillente; corolla blanca". It has been collected in woods and rich woods, forests, plantation forests, and mountain rainforests, thickets, fields, meadows, open canyon bottoms, and small ravines, as well as on open hillsides, at altitudes of 200 to 3750 meters, flowering from July to November and from January to March, fruiting in January, July, and September. Cuatrecasas describes it as "abundant" in Boyacá; Kernan calls it "dominant in crown class, southwest exposure" in Magdalena. Ewan found it "frequent in thickets along borders of monte; shrub 2 m. tall, very odorous with scent of Verbena citriodora but habit of Hyptis". The Littles call it a "Disturbed paramillo shrub type

and dwarf forest" species. Daniel (1947) says "se encuentra con cierte frecuencia en las arboledas rezagadas que han escapado al golpe del hacha de estos alrededores; he coleccionado ejemplares en San Cristóbal, La Ceja, Cocorná." The records from Caldas, Valle del Cauca, and "cultivated" given by me in previous publications appear to apply only to L. schlimii var. glabrescens, and not to L. hirsuta.

A simple key for distinguishing L. hirsuta from related taxa may be written as follows:

1. Heads large; leaf-blades densely tomentose or tomentose-pubescent beneath.....L. hirsuta.
1a. Heads small.
2. Leaf-blades ovate, very decidedly bullate, tomentose beneath.....L. moritzii.
2a. Leaf-blades elliptic, not decidedly bullate.
3. Leaf-blades glabrescent beneath, narrow-elliptic; inflorescence not especially ample.L. schlimii var. glabrescens
3a. Leaf-blades densely pubescent beneath, broadly elliptic; inflorescence very ample.....L. schlimii.

Common names recorded for L. hirsuta are "gallinazo", "salvia", and "salvio blanco". Material has been misidentified and distributed in herbaria under the names L. briquetii Moldenke, L. floribunda H.B.K., L. moritzii Turcz., Buddleia sp., Hyptis sp., and Verbesina sp. On the other hand, the Archer 267 & 1110, Cuatrecasas 20471, Gehriger 337, Gutiérrez Villegas 1093, W. H. Hodge 6744, Killip, Barkley, & Daniel 39841, Killip & Smith 16982, F. C. Lehmann 898 & 3137, F. W. Pennell 8891 & 8922, Steyermark 57271 & 57469, and Toro 865 & 1281, distributed as L. hirsuta, are all L. schlimii var. glabrescens (Moldenke) Moldenke, while Allart 85, 176, & 288a, Bailey & Bailey 994, Cuatrecasas 1863 & 13572, Delgado 54, Eggers 13580, Fendler 863, Jahn 1140, H. Pittier 9869, 9870, 9966, & 13779, and Seifritz 397 are L. moritzii Turcz., and Bourgeau 1217 is L. pringlei Briq.

Hodge (1947) cites an "Arcehr 267" from Antioquia, but this is a typographic error for Archer 267, which is L. schlimii var. glabrescens, as are all the other specimens which he cites.

In all, 50 herbarium specimens, including type material of all the names involved, and 2 mounted photographs have been examined by me.

Citations: COLOMBIA: Antioquia: Cuatrecasas & Willard 26230 (W); Escallón 4 [Herb. Linnaeus G.801, S.3] (Ls--type, N--photo of type, Z--photo of type); Hathaway 1769 (B); W. H. Hodge 65-28 (Fn). Boyacá: Ariste-Joseph A.293 (W--1040021); Cuatrecasas 1157 (W--1772897), 1269 (W--1772933), 1795 (Jc), 1797 (W--1796841), 1864 (W--1773189), 10398 (W--1796491); F. R. Fosberg 22193 [U. S. Nat. Arb. 282611] (N, W--2165646); Grubb, Curry, & Fernandez-

Perez 696 (W--2322607). Cundinamarca: Ariste-Joseph A.239 (W--888448), s.n. [near Bogotá] (W--1124897), s.n. [region of Bogotá] (W--1040085); Cuatrecasas 152 (W--1772761), 8208 (Jc), 13572 (N, W--1851400); Cuatrecasas & Jaramillo 12003 (W--1850854); Ewan 16922 (W--2106341); F. R. Fosberg 20618 [U. S. Nat. Arb. 282618] (Ca--43611, W--2165477); García y Barriga 11011 (N); Hartweg 1354 (N); Haught 5923 (W--1903270); Huertas & Camargo 1259 (W--2250951); Little & Little 9228 (N, N, W--2140905), 9795 (N, W--2141146); F. W. Pennell 2462 (N, W--1042309); Triana 2049 (W--1481365). Magdalena: Cuatrecasas & Castañeda 24688 (Z), 24717 (Fg); Kernan 163 (W--2107169). Norte de Santander: Cuatrecasas & Garcia Barriga 10279 (W--1799492); Garganta Fábrega 702 (F--1292053). Santander: Killip & Smith 16885 (N, S, W--1352573), 18757 (N, W--1354115). Department undetermined: Herb. Mus. Paris 1 (N, S); Triana 148 (N, W--1480731). VENEZUELA: Mérida: Gines 1587 (W--2048533).

LIPPIA HIRTA (Cham.) Meisn. ex D. Dietr., Syn. Pl. 3: 599. 1843.

Synonymy: Dipterocalyx hirtus Cham., Linnaea 7: 241--242, pl. 7, fig. D. 1832. Dipterocalyx glabrescens Cham., Linnaea 7: 242--243. 1832. Lippia glabrescens Meisn. ex D. Dietr., Syn. Pl. 3: 599. 1843. Lippia hirta Meisn. ex Walp., Repert. Bot. Syst. 4: 56. 1845. Lippia glabrescens (Cham.) Meisn. ex Walp., Repert. Bot. Syst. 4: 56. 1845. Lippia hirta Schau. in Mart., Fl. Bras. 9: 230. 1851. Lippia glabrescens Cham. & Schl. ex Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 2: 821 [as "glabrescente"]. 1902. Lippia hirta Cham. ex Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 305, in textu. 1904. Lippia glabrescens Cham. ex Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 305, in textu. 1904. Lippia hirta (Cham.) Schau. ex Moldenke, Alph. List Invalid Names 31. 1942.

Bibliography: Cham., Linnaea 7: 241--243. 1832; D. Dietr., Syn. Pl. 3: 599. 1843; Walp., Repert. Bot. Syst. 4: 56. 1845; Schau. in A. DC., Prodr. 11: 579. 1847; Schau. in Mart., Fl. Bras. 9: 230--231, pl. 37, fig. 2. 1851; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 95. 1894; Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 305. 1904; Stapf, Ind. Lond. 4: 125. 1930; Moldenke, Suppl. List Invalid Names 3 & 5. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 37 & 95. 1942; Moldenke, Alph. List Invalid Names 23 & 31. 1942; Moldenke, Alph. List Cit. 1: 171 & 172. 1946; Moldenke, Castanea 13: 116. 1948; Moldenke, Alph. List Cit. 2: 445 (1948), 3: 689, 704, 705, & 921 (1949), and 4: 1248--1251. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 80 & 190. 1949; Stellfeld, Trib. Farmac. 19 (10): 168. 1951; Angely, Fl. Paran. 7: 12. 1957; Moldenke, Résumé 93, 278, 313, & 461. 1959; Angely, Fl. Paran. 16: 60 (1960) and 17: 46. 1961; Troncoso, Darwiniana 12: 263. 1961; Moldenke, Résumé Suppl. 8: 4 (1964), 10: 5

(1964), and 11: 4, 6, & 7. 1964; Moldenke, Phytologia 12: 23 & 151. 1965.

Illustrations: Cham., Linnaea 7: pl. 7, fig. D. 1832; Schau. in Mart., Fl. Bras. 9: pl. 37, fig. 2. 1851.

Shrub, about 0.5 m. tall; stems strict, suffruticose, woody at the base, subterete, hirsute-pilose with spreading hairs that are conic-callose at the base, finally merely asperous, subsimple or with a few erect branches above, floriferous at the apex; principal internodes 4--5 cm. long, the upper ones longer; leaves decussate-opposite, ternate, or verticillate, subsessile, spreading-erect; leaf-blades thick and stiff, ovate-elliptic, acute at the apex, serrate and revolute along the margins, obtuse and entire at the base, lineate and more or less rugose between the veins above, shiny and more or less callose-hirtous (at the base of the teeth) above, finally very scabrous, glaucescent and shiny beneath, hirsutulous on the venation, finally glabrescent, penninerved, often 3-plinerved at the base, the lower ones 4--5 cm. long and about 1.8 cm. wide and equaling the internodes, the upper gradually smaller and more distant, those beneath the flowers minute, the venation prominent beneath; inflorescence terminal, verticillate-racemose, the lower whorls distant, the upper ones approximate, the uppermost ones confluent; peduncles axillary, single or paired, about 1.2 cm. long, somewhat spreading, scabrous-hirtous; heads small, about 1.3 cm. long, oblong, later becoming subcylindric, 6-ranked, squarrose; bractlets 6-ranked, imbricate, concave, spreading, about 3 mm. long, as wide as the calyx, squarrose, rather thick, broadly ovate, varying from subobtuse or subacute to acute or subacuminate at the apex, shiny, scabrous on the back, spinulose on the margins, sub-trinerved; calyx compressed-tubular, slightly shorter than the bractlets, shortly 2-fid, puberulent, carinate-winged on both sides, the wings sublenticular-disciform and long-villous-ciliate, the hairs surpassing the bractlets on both sides, the lobes rounded and emarginate at the apex; corolla white, exserted, about 4 mm. long, puberulent above on the outside, its tube infundibular or subinfundibular, straight, villosulous in the throat, its limb small, 4-parted, the lobes obtuse at the apex, the upper ones 2-parted, the lowest one somewhat larger and incurved; stamens didynamous, inserted at the middle of the corolla-tube; anthers subsessile; style very short; stigma terminal, subpeltate-capitate; ovary glabrous; fruit chartaceous, ellipsoid or (when mature) ovoid, rather turgid throughout, smooth, covered by or even partly hidden by the entire non-adherent fruiting-calyx, compressed at the apex, with a very shallow channel between the cells, the cocci not easily separating.

The type of this species was collected by Friedrich Sellow somewhere in southern Brazil and was deposited in the herbarium of the Botanisches Museum at Berlin, where it was photographed by Macbride as his type photograph number 17515, but is now destroyed. Chamisso (1832) says merely "E Brasilia misit Sellow". The type of Dipterocalyx glabrescens is similarly designated by him: "Semel iterumque lectam e Brasilia misit Sellowius". Schauer (1851) says of L. hirta: "In Brasilia loco ignoto, plantam certo rarem

legit Sellow." He places the species, of course, in his Section Dipterocalyx and says "Verticillus inferior unus alterve nonnumquam pedunculorum loco ramulos floriferos emittit." He also comments that "Dipterocalyx glabrescens Cham. l. c. quod examine speciminum authenticorum in herb. Reg. Berol. edoctus sum, ejusdem plantae exhibet individua aetate magis provecta, deflorata, loco forte magis umbroso enata indumento rariori minusque hirto, foliis tenuioribus substantiae atque minus rugosis, bracteis parum per acutioribus."

Regarding the validity of Dipterocalyx as a genus, Troncoso (1961) says: "Lippia hassleriana pertenece a la sección Dipterocalyx (Cham.) Schauer a causa de su cáliz 2-alado, con alas largamente ciliadas. Este carácter considerado por Chamisso de gran valor taxonómico, pues le sirvío para crear el género Dipterocalyx .....no fue correctamente interpretado por su autor. Según la ilustración dada por Chamisso, las alas aparecen como un simple repliegue del cáliz, por en contrario se trata de dos alas membranosas, vesiculosas. Esta cáliz vesiculoso es probablemente un medio de diseminación ya que las semillas en su madurez permanecen encerradas par el mismo. Igual tipo de cáliz presente L. hirta (Cham.) Sch.....y L. sclerophylla Briq."

Some authors imply that the combination, Lippia hirta, was made by Meisner in his Gen. Pl. Vasc. 2: 199 (1839), but it actually was not made there. It is also sometimes cited to a "Meissn., Comment. 242", which I have as yet not been able to trace.

The species has been collected on campos, dry or grassy campos, fields, sandy riverbanks, and moist campos at the edge of woods, in campo-like openings in woods, and near streams, at an altitude of 800 meters, flowering from December to March, fruiting in January. Material has been misidentified and distributed in herbaria as Verbena sp. On the other hand, the Mendes Magalhães 1768, distributed as L. hirta, is actually the type collection of L. violacea Moldenke.

In all, 26 herbarium specimens and 3 mounted photographs, including phototypes of most of the names involved, have been examined by me.

Citations: BRAZIL: Paraná: Braga & Lange 180 (Gg, N, W--2369346), 259 (Bm, Gg, W--2369349); Dusén 36 (S), 2600 (S), 7344 (W--1481649), 7344a (S), 16263 (Ca--501677, N, S), 17588 (S, W--1481650), s.n. [Herb. Rio Jan. 31522] (N), s.n. [Lago, March 7, 1904] (S), s.n. [Villa Velha, March 13, 1904] (S), s.n. [12.3.1904] (I); Hatschbach 2904 (N), 5397 (Mm); Tessmann s.n. [Herb. Mus. Paran. 2838] (N). Rio Grande do Sul: Malme 1152 (S), s.n. [Cruz Alta, Jan. 21, 1902] (S). Santa Catarina: Smith & Klein 10672 (Z). State undetermined: J. F. T. Müller 144 (P); Sellow s.n. [Brasilia; Macbride photos 17515] (Kr--photo of type, N--photo of type, W--photo of type).

LIPPIA HISPIDA Good, Journ. Bot. 68: Suppl. 2: 139--140. 1930.

Bibliography: Good, Journ. Bot. 68: Suppl. 2: 139--140. 1930; A. W. Hill, Ind. Kew. Suppl. 8: 137. 1933; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 51 & 95 (1942) and [ed. 2], 119 & 190. 1949; Moldenke, Résumé 147 & 461. 1959.

Perennial glandular-hispid herb; stems angular, about 1 mm. thick, densely hispid-hirsute; leaves subsessile, the blades elliptic-lanceolate or lanceolate, to 7 cm. long and 3 cm. wide, dentate along the margins, rugose-hispid above, paler and hispid beneath, the venation impressed above, prominent beneath, the secondaries about 8 pairs, a few pairs issuing from the leaf-base; inflorescence long-pedunculate; peduncles about 5 cm. long, somewhat shorter than the leaves, hispid; heads small, about 1 cm. long; bractlets ovate, about 5 mm. long, mucronate-acute at the apex, hispid-pubescent on the outer surface; calyx 0.5--1 mm. long, minutely pubescent, the tube obsolete, the lobes 2, much shorter than the corolla-tube, rounded; corolla hypocrateriform, pale-yellow, turning white in age, the tube subcylindric, 2.5--3 mm. long, slightly constricted at the base, subglabrous on the outer surface, the lobes 4, minute, spreading, rounded, pubescent on the outside; anthers sessile, rounded-oval: style filiform, 1.5--2 mm. long, about half as long as the corolla-tube, subcapitate at the apex.

The type of this poorly known species was collected by John Gossweiler (no. 2362) in rocky short thickets about the Fte. P. Amelia, Cubango, Angola, flowering in December. The plant is said to have been common in the type locality and to be "Very closely allied to L. Wilmsii H. H. W. Pearson, but differing in the shape of the leaves, the much coarser hairiness, the shape of the bracts, and other minor characters." The species is known to me only from the original description.

LIPPIA HOEHNEI Moldenke ex F. C. Hoehne, Resen. Hist. Comm. Viges. Anniv. Secc. Bot. Agron. Inst. Biol. S. Paulo 153, hyponym (1937); Moldenke, Phytologia 1: 467--468. 1940.

Bibliography: F. C. Hoehne, Resen. Hist. Comm. Viges. Anniv. Secc. Bot. Agron. Inst. Biol. S. Paulo 153 & 161. 1937; Moldenke, Phytologia 1: 467--468 (1940) and 1: 504. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 37 & 95. 1942; Moldenke, Phytologia 2: 67 & 107. 1945; Moldenke, Alph. List Cit. 1: 121. 1946; E. J. Salisb., Ind. Kew. Suppl. 10: 134. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 64. 1948; Moldenke, Alph. List Cit. 2: 552 (1948) and 3: 704 & 705. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 80 & 190. 1949; F. C. Hoehne, Ind. Bibl. & Num. Pl. Col. Com. Rondon 348. 1951; F. C. Hoehne, Relat. Anual Inst. Bot. S. Paulo Sept. 1951: 139. 1952; Moldenke, Résumé 93 & 461. 1959.

Perennial herb or shrubby, to 1.7 m. tall; branchlets and twigs slender, ascending, buff-colored, densely puberulent throughout with very short erect brownish hairs; nodes annulate; leaves decussate-opposite, sessile, clasping at the base; leaf-blades sub-

orbicular, 3--6 cm. long and wide, rounded (in outline) at the apex, cordate at the base, regularly serrate along the margins from the base to the apex with appressed and bluntish teeth or sinuate below, the very apex often marked with a sharply acute or acuminate tooth, minutely puberulent and nitidulous above, rather densely spreading-pubescent on the whole venation beneath; midrib, secondaries, and the vein and veinlet reticulation subimpressed above, very prominent and conspicuous beneath in a beautiful reticulum; inflorescence axillary and terminal, clustered in a dense panicle at the tips of the branches, the inflorescence-branches erect or ascending, conspicuously bracteate; bracts large, ovate, sessile, entire or serrate, acute at the apex; heads dense, short-pedunculate, crowded.

The type of this handsome species was collected by my good friend, Frederico Carlos Hoehne (Com. Rondon 2177) -- in whose honor it is named -- at Trés Jacús, Matto Grosso, Brazil, in 1908, and is deposited in the herbarium of the Instituto Botanico at São Paulo, Brazil. The species has been found in sandy cerrado and in sandy places in less dense cerrado, flowering in June and July. A vernacular name recorded for it is "atiaci".

Dr. Hoehne has stated to me that his Com. Rondon 1918 also represents this species. It was deposited in the herbarium of the Botanisches Museum at Berlin, but is now destroyed. In all, 13 herbarium specimens, including the type, and 6 mounted photographs have been examined by me.

Citations: BRAZIL: Matto Grosso: F. C. Hoehne, Com. Rondon 1873 (N), 1949 (Sp--31987), 2177 [334; 344] (B--isotype, N--isotype, N--photo of type, Sp--type, Z--photo of type); Malme 1748b (N, S, S), 2004 (N, S, S), 3459 (F--photo, N, N--photo, S, Si--photo, Z--photo).

LIPPIA HYPOLEIA Briq., Ann. Conserv. & Jard. Bot. Genèv. 4: 236--237. 1900.

Synonymy: Lippia myriocephaloides Briq., Ann. Conserv. & Jard. Bot. Genèv. 4: 235--236. 1900. Lippia hypoleuca Briq. ex K. Schum. in Just, Bot. Jahresber. 28 (1): 496. 1902. Buddleia bracteolata Kränzl., Bull. Jard. Bot. Petersb. 13: 90--94. 1913. Buddleja bracteolata Kränzl. ex Moldenke, Résumé 240, in syn. 1959.

Bibliography: Briq., Ann. Conserv. & Jard. Bot. Genèv. 4: 235--237. 1900; K. Schum. in Just, Bot. Jahresber. 28 (1): 496. 1902; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 106. 1904; Prain, Ind. Kew. Suppl. 3: 104. 1908; Kränzl., Bull. Jard. Bot. Petersb. 13: 90--94. 1913; Prain, Ind. Kew. Suppl. 5: 36. 1921; C. L. Lundell, Carnegie Inst. Wash. Publ. 478: 45, 75, 135, 137, 183, 194, & 203. 1937; Moldenke, Alph. List Common Names 10 & 29. 1939; Moldenke, Suppl. List Common Names 14. 1940; Moldenke, Prelim. Alph. List Invalid Names 31. 1940; Moldenke, Carnegie Inst. Wash. Publ. 522: 164, 168--169, 219, & 221. 1940; C. L. Lundell, Contrib. Univ. Mich. Herb. 8: 61. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 17, 20, 21, & 95. 1942; Moldenke, Alph. List Invalid Names

31. 1942; Moldenke, Phytologia 2: 107. 1945; Moldenke, Alph. List Cit. 1: 5, 32, 33, 38, 53, 194, & 246. 1946; Moldenke, Phytologia 2: 330 & 384. 1947; Moldenke, Alph. List Cit. 2: 327, 329, 335, 467, 468, & 607 (1948), 3: 676, 677, 697, 714, 757, 787, 829, 830, 833--835, 842, 946, & 973 (1949), and 4: 1013, 1180, 1227, 1244, 1294, & 1295. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 31, 35, 36, & 190. 1949; F. Miranda, Veg. Chiapas 1: 287-288 (1952) and 2: 363. 1953; Moldenke, Résumé 37, 42, 43, 240, 315, & 461. 1959; F. Miranda, Bol. Soc. Bot. Mex. 26: 143 & 148. 1961; Moldenke, Résumé Suppl. 3: 11 (1962), 4: 4 (1962), and 8: 4. 1964; Moldenke, Phytologia 12: 111. 1965.

Shrub or large shrub to small or tall tree, 3--16.5 m. tall, sometimes only treelike; stem to 15 cm. in diameter, not white; branches and branchlets tetragonal, often sharply angled and the angles short-aculeate, densely hirsute-tomentose when young, less so in age, not white; twigs slender, subterete or more obtusely tetragonal, unarmed or with only a few scattered and minute aculeations, densely short-pubescent or hirsute-tomentose with cinereous or subfuscous hairs; leaves decussate-opposite, with a fetid odor, petiolate; petioles 4--10 mm. long, appressed-pubescent or strigose; leaf-blades chartaceous or submembranous, dark-green and somewhat shiny above, paler beneath, elliptic or ovate-elliptic to oblong-lanceolate, 8--15 cm. long, 3--5 cm. wide, acuminate or mostly long-attenuate or more rarely abruptly acute at the apex, regularly but rather obscurely crenulate along the slightly revolute margins (except at the base) with greatly appressed teeth, cuneately contracted into the petiole at the base, subscabridous above with short rigid hairs, varying from appressed-short-pubescent along the venation beneath to densely and uniformly softly cinereous-tomentose, mostly densely velutinous beneath when young; inflorescence cream-color; peduncles very slender, 3--8 or more in each leaf-axil, 1--3 cm. long, densely short-pubescent or hirsutulous-tomentose, often a much more elongate one among them with a secondary umbel of 4--8 pedunculate heads or a twig with several abbreviated bract-like pairs of leaves and clusters of short-pedunculate heads; heads small, conglobate, subspherical, 2--3 mm. in diameter, to 5 mm. long; bractlets membranous, broadly ovate, subreniform in age, veiny, short-acuminate at the apex, finally more or less reflexed, short-ciliate, not conduplicate nor carinate, many-ranked, not attenuate nor widely divergent at the apex, the lowermost also densely short-pubescent on the back, equaling or surpassing the corollas; calyx small, about 0.5 mm. long, shortly 2-lobed, villous; corolla very small, white, light cream-color, or deep cream-color to pale-yellow or yellow, its tube several times longer than the calyx, hirtellous on the outside.

This interesting species was based by Briquet on two collections made by Henri Guillaume Galeotti -- (1) no. 752 in hedges and woods at 3000 feet altitude in the Cordillera of Vera Cruz, and (2) no. 770 at 4000 feet altitude in Oaxaca, Mexico, deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques in Geneva. The type of L. myriocephaloides, which may, per-

haps, be worthy of varietal rank, was collected by Cyrus Guernsey Pringle (no. 3277) in Tamasopo Canyon, San Luis Potosí, Mexico, in September, and is deposited in the same herbarium. Briquet (1900) maintains that L. hypoleia differs from L. myriocephala Schlecht. & Cham. in being "mais distinct.....par ses rameaux tomenteux-hirsutes et les feuilles veloutées à la face inférieure." Also, I find that it produces more secondary umbels. In the past, however, it has been confused almost uniformly with L. myriocephala, of which it may possibly be only a pubescent variety. C. L. Smith 1076 seems to represent an intermediate form, but its young leaves, at least, are canescent-pubescent beneath. Lundell (1937) regarded it as L. myriocephala.

The type of Buddleia bracteolata was collected by Freiherr Wilhelm Friedrich von Karwinski von Karwin (no. 696) somewhere in Mexico, and is deposited in the Fischer Herbarium at Leningrad.

Lippia hypoleia has been found growing in forests and open woods, canyons, moist localities, secondgrowth and secondgrowth on cohune ridges, and mixed woods with pines, along gypsum cliffs on lakeshores, on hills and hilltops, steep slopes bordering barrancas, and steep rocky sparsely wooded slopes, at altitudes of 1500 to 4800 feet, flowering from November to May and July to September, and fruiting from December to May. In the Yucatán Peninsula it is said to inhabit marginal scrub forests around savannas and secondgrowth. Lundell describes it as "common around savannas in marginal scrub forest" and as a prominent tree in the scrub forests overrunning savannas and a common small tree in young secondary upland forests. McVaugh found it on steep mountainsides and barrancas in fir forests with Pinus, Ostrya, Cornus, Meliosma, and Podocarpus in Jalisco. Lundell refers to it as "a common tree" and a "common pioneer tree" in Guatemala. Palmer describes it as "very ornamental" and as a "small ornamental tree". His no. 1137, cited below from San Luis Potosí, was actually gathered "En route from San Luis Potosí to Tampico". A note appended to the Purpus 8648 collection says "rare, only one tree; leaves entire and more glabrous", but it is not certain that this comment actually applies to that collection.

The corollas are described as "white" on Bartlett 11503 and Galeotti 752, "light cream-color" or "deep cream-color" on Edw. Palmer 1137, "pale-yellow" on Dressler & Jones 190, and "yellow" on Mc Vaugh 21511.

Vernacular names recorded for this plant are "corazon amarillo", "corazón amarillo", "cutujume", "maste", "palo de gusano", "sacmumís", "sacmumutz", "siguinay blanco", "tabaquillo", "tah", and "tamesagua". The name, "tabaquillo", is, however, also applied to Aegiphila anomala Pittier, A. valerii Standl., and Lippia pringlei Briq.

Material of L. hypoleia has been misidentified and distributed in herbaria under the names L. callicarpaefolia H.B.K., L. graveolens

H.B.K., L. myriocephala Cham. & Schlecht., L. myriocephala Schlecht. & Cham., L. umbellata Cav., and Hippia graveolens H.B.K.

In all, 118 herbarium specimens and 1 mounted photograph, including type or phototype material of all the names involved, have been examined by me.

Citations: MEXICO: Chiapas: Breedlove 6201 (Ac), 7376 (Ac), 7643 (Ac); Matuda 3630 (A, N, N), 5300 (Ld). Jalisco: R. McVaugh 21511 (Mi). Oaxaca: Galeotti 770 (Br--cotype). San Luis Potosí: Kenoyer s.n. [Valles, 9-3-38] (Fs); Edw. Palmer 1137 (G, Io, Pa, Pa); Pringle 3277 (A, Br, C, Ca--104906, Cm, Es, G, Me, Me, Mi, Mm--15411, Ob--50729, Pa, Po--63854, S, Vt); J. Rzedowski 6906 (Au). Vera Cruz: Balls B.5489 (Ca--684285); Berlandier 2159 (G, T); Botteri 881 (G, G, S); Bourgeau 1471 (Br, G, S), 2983 (Br, C, G, S); Dressler & Jones 190 (Ca--48876, G, N); Ervendberg 288 (G, T); Galeotti 752 (Br--cotype); J. M. Greenman 274 (G, N); N. L. H. Krauss 858 (W--2367811); MacDaniels 354 (Ba); Pringle 11668 (Fs, G, Gg--421286, It, Me, Me, Mi, Rf, Vt); Purpus 421 (Ca--104929, Po--64306), 2254 (Du--77084, G, N, Tu), 5751 (A, Ca--163122, G, N), 8648 (Ca--208397, G, N), 14091 (A, Mi, W--1638300), 14093 (Ca--429028); C. L. Smith 1076 (Ca--975392, G, Mi, N, N, N, Tl, Vt). State undetermined: Karwinski 696 (Z, Z--photo); W. Schaffner 1 (S). GUATEMALA: Alta Verapaz: Türckheim II.1474 (S). Copán: Record & Kuylen G.90 [Herb. Mus. Yale School Forest. 10041] (N). El Petén: Aguilar Hidalgo 394 (I, Mi, N); Contreras 2034 (Ld, S); C. L. Lundell 2119 (Mi, S), 2599 (Mi, Mi), 2780 (Mi, S), 3171 (F--714093, Mi, S), 17256 (Ld, S). San Marcos: Steyermark 36722 (F--1053464). BRITISH HONDURAS: H. H. Bartlett 11503 (Du--266231, F--665423, Gg--233411, Mi), 13008 (Ca--72670, F--659101, Mi). EL SALVADOR: San Salvador: M. C. Carlson 430 (Ca--703550), 431 (Ca--703549).

LIPPIA INDICA Moldenke, Phytologia 1: 427. 1940.

Bibliography: Moldenke, Phytologia 1: 427 (1940) and 1: 504. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 54 & 95. 1942; Moldenke, Alph. List Cit. 1: 220. 1946; E. J. Salisb., Ind. Kew. Suppl. 10: 134. 1947; Moldenke, Alph. List Cit. 2: 639 (1948) and 4: 1127. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 127 & 190. 1949; Razi, Rec. Bot. Surv. India 18: 31 & 34. 1959; Moldenke, Résumé 163 & 461. 1959.

Perennial herb; stems and branches slender, obtusely tetragonal, densely hirsutulous or short-pubescent, becoming more sparsely so or merely puberulent in age, the hairs whitish; nodes annulate; leaves decussate-opposite, often with fascicles of small ones on greatly abbreviated twigs in their axils, petiolate; petioles slender, 3--15 mm. long, very densely or sparsely hirsute with whitish hairs; leaf-blades chartaceous, gray-green, ovate, 0.8--7.5 cm. long, 0.6--3.5 cm. wide, obtuse at the apex, regularly

serrate from the base to the apex with extremely small and blunt somewhat appressed teeth, very bullate and rather densely strigose with appressed whitish hairs above, densely tomentulose beneath; inflorescence axillary, clustered toward the tips of the branches, spicate; spikes elongate, 2--5.5 cm. long, 1--3 in each upper leaf-axil, erect or ascending, the floriferous part 0.4--2.6 cm. long, uniformly 5--6 mm. wide throughout; peduncles very slender, 1.5--2.6 cm. long, densely short-pubescent or puberulent with whitish hairs, often binary (divided to half way down and bearing two spikes).

The type of this species was collected by James Sykes Gamble (no. 17895) at Sigué Ghát, in the Nilgiris District, Madras, India, in August, 1886, at an altitude of 3000 feet, and is deposited in the herbarium of the Royal Botanic Gardens at Kew. The species has been collected in anthesis in August and December. Material has been misidentified and distributed in herbaria as Lantana sp.

A letter to Mr. C. E. C. Fischer from the Botanical Assistant at the Government Museum, Egmore, Madras, dated March 18, 1936, speaks of the locality of collection of R. Wight 2295 and 2295bis, where this species was found in December, 1848: "Thavanampalayam is a small village in the Dharapuram taluk in Coimbatore District .....This area is very different in character from the Sigur ghat and the Anamalais which are the localities for Lippia geminata. Speaking from the climate it is quite possible that it might be a different species."

In all, 9 herbarium specimens, including the type, and 2 mounted photographs have been examined by me.

Citations: INDIA: Coimbatore: R. Wight 2295 (Le--908266-238), 2295bis (Cp, N, N, S, V). Madras: Beddome s.n. [1885] (K); Gamble 17895 (K--type, N--photo of type, Z--photo of type); Lawson s.n. [Sigûr Ghát, Nilgiris, 17/3/86] (K).

LIPPIA INOPINATA Moldenke, Phytologia 9: 7--8. 1963.

Bibliography: Moldenke, Phytologia 9: 7--8. 1963; Moldenke, Résumé Suppl. 6: 4. 1963.

Woody shrub; stems tall, woody, gray, subterete, glabrous; branchlets slender, brownish, obtusely tetragonal, villous with subappressed antrorse grayish hairs; principal internodes much abbreviated, 8--21 mm. long; leaves decussate-opposite, petiolate; petioles very short, 2--5 mm. long, densely whitish-villous with long antrorse hairs; leaf-blades subcoriaceous, rather uniformly grayish-green on both surfaces, ovate-elliptic, often falcate-conduplicate, small, 2--3 cm. long, 1--1.5 cm. wide, acute at the base and apex, coarsely serrate along the margins with antrorse sharply acute teeth, rather sparsely villous and bullate-lineate above, more densely gray-villous beneath; midrib and secondaries deeply impressed above and sharply prominent beneath; veinlet reticulation more or less subimpressed above and slightly prominulous beneath; inflorescence axillary, crowded near the apex of the twigs, equaling or slightly surpassing the subtending leaves, soli-

tary in each axil; peduncles filiform, 1.5--2.3 cm. long, densely spreading-villous; heads subglobose, yellowish, about 1.5 cm. long and wide, densely many-flowered; bractlets papery, subobtuse at the apex, densely pubescent on both surfaces.

The type of this species was collected by Howard Scott Gentry (no. 18267) in an Opuntia thicket on a rocky slope in cactus-acacia association, at an altitude of 6200 feet, Villa Nueva, Zacatecas, Mexico, on November 29, 1959, and is deposited in the C. L. Lundell Herbarium at the Texas Research Foundation in Renner, Texas. The species is known thus far only from the original collection. In all, 3 herbarium specimens, including the type, have been examined by me.

Citations: MEXICO: Zacatecas: H. S. Gentry 18267 (Ld--type, W--2301983--isotype, Z--isotype).

LIPPIA INTEGRIFOLIA (Griseb.) Hieron., Bol. Acad. Nac. Córdoba 4: 406. 1881.

Synonymy: Lippia turbinata var. integrifolia Griseb., Abhand. Kaiser. Gesell. Wiss. Gütting. 19: 243. 1874. Lippia integrifolia Hieron. ex Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 95. 1894. Lippia turbinata var. integrifolia (Griseb.) Hieron. ex Latzina, Lilloa 1: 189, in syn. 1937. Lippia integrifolia Griseb. ex Moldenke, Résumé 313, in syn. 1959.

Bibliography: Griseb., Abhand. Kaiser. Gesell. Wiss. Gütting. 19: 243. 1874; Griseb., Pl. Lorentz. 195. 1874; Hieron., Bol. Acad. Nac. Córdoba 4: 406. 1881; Hieron., Pl. Diaph. Fl. Argent. 212, 364, 395, & 399. 1882; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 95. 1894; Doming., Mat. Med. 117. 1928; Seckt, Fl. Cordob. 417. 1929-1930; Seckt, Rev. Univ. Nac. Cordoba 17: 89. 1930; Latzina, Trab. Inst. Bot. & Farm. Buenos Aires 54: 112. 1935; Latzina, Lilloa 1: 189. 1937; Moldenke, Alph. List Common Names 25. 1939; Moldenke, Lilloa 5: 423--424 (1940) and 8: 424. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 43 & 95. 1942; Moldenke, Alph. List Invalid Names 32. 1942; Moldenke, Lilloa 10: 378. 1944; P. I. Acuña, Catalog. Fl. Catamarq. 17. 1945; Moldenke, Phytologia 2: 79, 89, & 107. 1945; Moldenke, Lilloa 12: 148. 1946; Moldenke, Alph. List Cit. 1: 73, 83, 95--97, 128, 217, & 266. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 14. 1947; Moldenke, Lilloa 14: 43. 1948; Moldenke, Alph. List Cit. 2: 368, 376, 377, 441, 442, 537, & 600 (1948), 3: 689, 804, 865, 907, & 910 (1949), and 4: 1090, 1091, 1192, & 1293. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 105 & 190. 1949; J. H. Hunziker, Revist. Invest. Agric. 6 (2): 174, 175, 183, & 192. 1952; Moldenke, Résumé 125, 313, 318, & 461. 1959; Moldenke, Résumé Suppl. 11: 7. 1964; Moldenke, Phytologia 12: 47, 61, & 101. 1965.

Woody aromatic shrub, about 1 m. tall; leaf-blades oblong-linear, about 4 mm. wide, rather obtuse at the apex, entire; corolla white or purplish-white, its tube campanulate; stamens inserted below the mouth of the corolla-tube; style excentric, widened at the apex into a unilateral stigma.

The type of this interesting species was collected by Paul Gün-

ther Lorentz on a campo near Belen, Catamarca, Argentina, where the species is described as frequent. Collectors have found it in dry rocky ground, very arid soil of matorales, along highways, on dikes and campos, and between rocks on ridges, at altitudes of 1100 to 3000 meters, flowering from December to May, fruiting in April. Jörgensen calls it abundant in alpine deserts in Catamarca. Schreiter refers to it as medicinal in Tucumán, while Hunziker (1952) says that it is used as a cardiac tonic.

The original description of this taxon is "Foliis oblongo-linearibus obtusiusculis integerrimis. -- Flos (forsan ex statu dimorpho) ab α differt corollae tubo campanulato, staminibus infra faucem insertis, stylo excentrico in stigma unilaterale dilatato. Folia 2'" lata." and is sometimes cited to page 195. Hieronymus (1881) says: "Arbusto aliado al anterior [L. turbinata Griseb.], pero bien distinto como especie. Se le atribuye las mismas propriedades que al anterior."

The corolla is described as white on Rodriguez 1441, Ruiz Leal & Roig 18894, and Venturi 6972 & 8072, and as purplish-white on Burkart 12541. Vernacular names recorded for the species are "chacha coma", "manzanillo", "inca yuyo", "polco", "poleo", "pulco", and "yerba de Inca". The name "poleo" is, however, also applied to L. affinis Schau., L. alba (Mill.) N. E. Br., and L. turbinata Griseb., while "manzanillo" is applied also to Ruprechtia corylifolia Griseb.

Material has been misidentified and distributed in herbaria as L. boliviana Rusby, a very closely related species.

It should be noted here that Latzina, Lilloa 1: 189 is cited at the Instituto Miguel Lillo as "Latzina, Index II (1937) 189".

In all, 48 herbarium specimens and 5 mounted photographs have been examined by me.

Citations: ARGENTINA: Catamarca: Cabrera 1103 (N), 1123 (N); Castillón 947 [Herb. Inst. Miguel Lillo 32002] (N, N); Hauthal s.n. [1893] (N, N); Jörgensen 1734 [Herb. Osten 11012; Herb. Inst. Miguel Lillo 31934] (Ca—195340, Ug, Vi, W—917973), s.n. [Herb. Fac. Farmacol. Inst. Bot. Buenos Aires 1734; Herb. Mus. Argent. Cienc. Nat. 23855] (N, N—photo, Sp—25779, Sp); Peirano s.n. [El Portezuelo, April 19, 1935; Herb. Inst. Miguel Lillo 32869] (N); Schreiter 10590 [Herb. Inst. Miguel Lillo 32860] (N, N, Ug); Venturi 6932 (W—1591501). La Rioja: Burkart 12541 (N), 12551 (N); Castellanos s.n. [Sierra de Olta, Feb. 3, 1940; Herb. Mus. Argent. Cienc. Nat. 33843] (N); Covas 1133 (N); Hieronymus & Niederlein 875 (Vt); A. T. Hunziker 4731 (N); F. A. Roig s.n. [Herb. Ruiz Leal 17563] (Z). Salta: Castellanos s.n. [Herb. Mus. Argent. Cienc. Nat. 14809] (N); D. Rodriguez 1441 [Herb. Inst. Miguel Lillo 31932] (N, N, S, W—1802581), s.n. [Herb. Mus. Argent. Cienc. Nat. 23894] (N, N); Venturi 6942 (W—1591508), 6956 (W—1591510), 6972 (S), 8072 (N, N, S). San Juan: H. H. Bartlett 20558 (W—2320128); Ruiz Leal & Roig 18894 (Ok). San Luis: Bruch

& Carette 55 (N), s.n. [Alto Pencoso, Feb. 1914] (Ug). Tucumán: Castillón 3434 [Herb. Inst. Miguel Lillo 31930 & 32620] (N, Vi); Lillo 16385 [Herb. Osten 8447] (Ug); Schreiter 1202 [Herb. Inst. Miguel Lillo 32618] (Au, N). Province undetermined: Frenguelli s.n. [Yuca-yuyu, between Chicaguela & Yanso] (N); Galander s.n. [Cuesta de Las Huertes; Macbride photos 17517] (Kr--photo, N--photo, W--photo).

LIPPIA INTERMEDIA Cham., Linnaea 7: 378--379. 1832.

Synonymy: Lippia cryptantha Schau. ex Moldenke, Suppl. List Invalid Names 5, in syn. 1941. Riedelia intermedia Cham. ex Moldenke, Suppl. List Invalid Names 7, in syn. 1941.

Bibliography: Cham., Linnaea 7: 378--379. 1832; Steud., Nom. Bot., ed. 2, 2: 54. 1840; Walp., Repert. Bot. Syst. 4: 44. 1845; Schau. in A. DC., Prodr. 11: 589. 1847; Schau. in Mart., Fl. Bras. 9: 243. 1851; Lorentz, Veg. Nordeste Prov. Entre Rios, ed. 1, 15, 87, 150, & 172. 1878; Griseb., Abhand. Kaiser. Gesell. Wiss. Gütting. 24: [Symb. Fl. Argent.] 277. 1879; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 95. 1894; Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 316. 1904; Herter, Florul. Urug. 105. 1930; Moldenke, Suppl. List Invalid Names 5 & 7. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 37 & 95. 1942; Moldenke, Alph. List Invalid Names 30 & 40. 1942; Augusto, Fl. Rio Grande do Sul 235. 1946; Lorentz, Veg. Nordeste Prov. Entre Rios, ed. 2, 15, 87, 150, & 172. 1947; Moldenke, Lilloa 14: 40. 1948; Moldenke, Alph. List Cit. 3: 689 & 921. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 80 & 190. 1949; Moldenke, Résumé 93, 305, 311, 343, & 461. 1959; Moldenke, Résumé Suppl. 10: 3. 1964; Moldenke, Phytologia 12: 24 & 87. 1965.

Perennial herb; stems suffruticose, erect or ascending from the base, simple, virgate, subterete, about 45 cm. tall, hirsute below, racemose above and glandular-pubescent as well as strigose-hirsute, foliose to the base; leaves sessile, decussate-opposite, the lowest ovate, about 5 cm. long and 1.8 cm. wide, the middle ones oblong, and the upper ones elongate-lanceolate and considerably smaller and narrower, all acute at the apex, obsoletely serrate toward the apex and revolute along the margins, hirsutulous on both surfaces, glandulose-pubescent as well as strigose-hirtous above, also pubescent beneath, lineate and scabrous above; venation prominent beneath; peduncles solitary, longer than the floral leaves, glandulose-pubescent and strigose-hirtous; heads ovoid, long-pedunculate, a few in racemose fashion at the apex of the stem, about 1.7 cm. long; bractlets ovate, herbaceous, about 6 mm. long, 1-veined, loosely imbricate, with a slender recurved acumination, surpassing the corollas, smooth and shiny on the inner surface; calyx bifid, rather wide, very villous; corolla-tube 3 mm. long, straight, slender, subequal, pubescent on the outside, the limb very exiguous, bending forwards; fruit covered by the mature calyx, obcordate, dark-brown, shiny, splitting spontaneously into 2 halves, the commissure smooth, the pericarp coriaceous.

The type of this rare species was collected by Friedrich Sellow (no. 2810) in "Brasilia meridionali", probably Rio Grande do Sul, and was deposited in the herbarium of the Botanisches Museum at Berlin, where it was photographed by Macbride as his type photograph number 17518, but is now destroyed. The species inhabits campos and sandy campos, flowering in October and November, and has been collected in fruit in October.

Schauer (1847) places the species in his Section Zapania, Subsection Paniculatae. The Dusén 16736, distributed as L. intermedia, proves to be L. pumila Cham. Augusto (1946) cites a Herter collection from Rivera, Uruguay, but this has not as yet been seen by me. In all, only 1 herbarium specimen and 4 mounted photographs, which, however, include type or phototype material of all the names involved, have been examined by me.

Citations: BRAZIL: Paraná: Dusén 15735 (W—1481648). State undetermined: Sellow 2810 [Brasilia meridionali; Macbride photos 17518] (It--photo of type, Kr--photo of type, N--photo of type, W--photo of type).

LIPPIA IODOPHYLLA Schau. in A. DC., Prodr. 11: 588. 1847.

Bibliography: Schau. in A. DC., Prodr. 11: 588. 1847; Schau. in Mart., Fl. Bras. 9: 241. 1851; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 95. 1894; Glaz., Bull. Soc. Bot. France 58, Mém. 3: 542. 1911; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 37 & 95. 1942; Moldenke, Phytologia 2: 336. 1947; Moldenke, Alph. List Cit. 2: 366 & 534 (1948), 3: 670, 689, & 923 (1949), and 4: 1300. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 80 & 190. 1949; Moldenke, Résumé 93 & 461. 1959; Moldenke, Phytologia 12: 24 & 170. 1965.

Shrub or subshrub, to 1.5 m. tall, apparently stout, fastigiate-branched; branches thick, torulose, corky; branchlets nodose and leafless below, foliose above, strigose-hirtous; leaves decussate-opposite, crowded, short-petiolate or subsessile; leaf-blades coriaceous, sticky, patulous, cuneate-oblong, 1.2--1.8 cm. long, 6--8 mm. wide, subacute at the apex, crenate-serrulate toward the apex, entire at the base and cuneately attenuate into the petiole, 3-plinerved, with the main venation pinnate above, very densely glandulose-punctate on both surfaces, impressed-rugose and with scattered strigose hairs above, pale beneath and finally subferruginous and strigose-pubescent on the prominent reticulation; peduncles axillary, solitary, strict, equaling the subtending leaves, slightly ampliate and striate above, strigose-hirtous; heads hemispheric, about 12-flowered; bractlets submembranous, ovate to obovate-oblong, patulous, rather obtuse at the apex, inflexed, loosely imbricate, about half as long as the corolla-tube, strigose-pubescent; flowers fragrant; calyx membranous, narrow, tubular, bifid, strigose-pubescent, 4-dentate, almost half as long as the corolla-tube; corolla hypocrateriform, rose or violet, its tube about 5 mm. long, ventricose below the mouth, pulverulent-glandulose and pubescent above the calyx, the limb rather large, pulverulent-glandulose and pubescent on the back, the lobes undu-

late, velutinous on the upper surface, the upper one rounded and margined, the lateral ones ovate and bent forward, the lowest one larger, extended, subquadrate, concave, retuse, unguiculate.

The type of this species was collected by Friedrich Sellow in Minas Gerais, Brazil, and was deposited in the herbarium of the Botanisches Museum at Berlin, where it was photographed by Macbride as his type photograph number 17519, but is now destroyed. Schauer (1847) places the species in his Section Zapania, Subsection Axilliflorae. He says (1851) of it: "L. microcephalae quodammodo similis, sed jam foliorum figura et serratura minuta distincta."

It has been collected between stones at an altitude of 2200 meters, flowering in January, February, and April. Glaziou (1911) cites also his nos. 4158, 9542, & 16287 from the Serra dos Orgãos in Rio de Janeiro. It is probable that the "6287" cited hereinafter is his "16287".

Material of this taxon has been misidentified and distributed in herbaria as L. glandulosa Schau. In all, 7 herbarium specimens and 5 mounted phototypes have been examined by me.

Citations: BRAZIL: Minas Gerais: Sellow s.n. [Macbride photos 17519] (It--photo of type, Kr--photo of type, N--photo of type, N--photo of type, W--photo of type). Rio de Janeiro: Glaziou 3707 (Br), 6287 (Br); Sagadas-Vianna 145 (Ja), 421 (Ja), 668 (Ja). São Paulo: Löfgren s.n. [Picos dos Marins, Jan. 10, 1897; Herb. Com. Geogr. & Geol. S. Paulo 3495] (N, Sp--15659).

LIPPIA JALISCANA Moldenke, Phytologia 1: 427--428. 1940.

Bibliography: Moldenke, Phytologia 1: 427--428. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 17 & 95. 1942; Moldenke, Alph. List Cit. 1: 233. 1946; E. J. Salisb., Ind. Kew. Suppl. 10: 134. 1947; Moldenke, Alph. List Cit. 3: 730 (1949) and 4: 1237, 1245, & 1298. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 31 & 190. 1949; Moldenke, Résumé 37 & 461. 1959.

Shrub or small tree; branches and branchlets slender, brown, tetragonal, shortly appressed-pilose, decidedly scabrous, especially on the margins; nodes annulate; principal internodes 1.5--6 cm. long; leaves decussate-opposite; petioles very slender, 4--17 mm. long, short-pilose and scabrous; leaf-blades coriaceous, rather uniformly green on both surfaces or slightly lighter beneath, lanceolate, 4--11 cm. long, 1.7--3.2 cm. wide, acute at the apex, regularly serrulate from almost the base to the apex with blunt more or less appressed revolute teeth, acute or acuminate at the base, bullate and very scabrous above, puberulent and very densely glandular-punctate beneath; midrib slender, plane or subimpressed above, prominent beneath; secondaries very slender, 8--10 per side, arcuate-ascending, impressed above, sharply prominent beneath; vein and veinlet reticulation abundant, impressed above, sharply prominent beneath; inflorescence axillary, mostly paniculate with the heads borne in secondary umbels of 3--6, rarely a few simple ones included; peduncles very slender, 2--4 cm. long, densely short-pubescent

with spreading brownish hairs; secondary peduncles 1--1.5 cm. long; heads 6--10 mm. wide in anthesis, densely many-flowered; bractlets ovate, about 3 mm. long and wide, sharply acute at the apex, densely puberulent; corolla greenish-yellow, surpassing the bractlets.

The type of this species was collected by Ynes Enriquetta Julietta Mexia (no. 1636) in an oak-clad open forest on steep slopes along the trail from Real Alto to San Sebastian, at an altitude of 2000 meters, in the Sierra Madre Occidental, Jalisco, Mexico, on February 3, 1927, and is deposited in the Britton Herbarium at the New York Botanical Garden. The species has been found also on rocky ridges in oak forests at 1500 meters altitude, flowering and fruiting in February. Material has been misidentified and distributed in herbaria as L. umbellata Cav.

In all, 15 herbarium specimens, including the type, have been examined by me.

Citations: MEXICO: Jalisco: Jalisco: Mexia 1636 (A--isotype, Ca--350508--isotype, Du--195347--isotype, G--isotype, Gg--153245--isotype, La--isotype, Mi--isotype, N--type). Sinaloa: H. S. Gentry 5662 (Ak--20193, Ca--651756, Du--274087, Fs, Me, N).

LIPPIA JANGADENSIS S. Moore, Trans. Linn. Soc. Lond. Bot., ser. 2, 4: 435--436. 1895.

Bibliography: S. Moore, Trans. Linn. Soc. Lond. Bot., ser. 2, 4: 435--436. 1895; Durand & Jacks., Ind. Kew. Suppl. 1: 507. 1906; Glaz., Bull. Soc. Bot. France 58, Mém. 3: 540. 1911; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 37 & 95 (1942) and [ed. 2], 80 & 190. 1949; Moldenke, Alph. List Cit. 3: 689 & 748 (1949) and 4: 1300. 1949; Moldenke, Résumé 93 & 461. 1959; Moldenke, Résumé Suppl. 11: 4. 1964.

Tall erect appressed-pubescent perennial; stems stout, subterete, fistulose, about 6 mm. in diameter above, few-branched, striate, finally scaberulous; branchlets tetragonal, scarcely fistulose, about 2 mm. in diameter; leaves decussate-opposite, subsessile; petioles not over 2 mm. long, pubescent; leaf-blades membranous to coriaceous, oblong or oblong-ovate, mostly 3--5 cm. long, 1--2 cm. wide, rather acute at the apex, entire on the lower third of the margins, more or less crenate-serrulate on the remainder; secondaries 4 or 5, the basal ones paralleling the margins, the remainder obliquely ascending, very slightly arcuate; inflorescence paniculate or else solitary and axillary, often long-pedunculate when solitary; peduncles ascending, densely pubescent, about 4 cm. long on solitary inflorescences and 2 cm. in paniculate ones; heads about 7 mm. wide; bractlets ovate or obovate, about 3 mm. long, short-acuminate at the apex, surpassing the flowers, shortly yellowish-lanate on the outer surface, smooth on the inner surface, lanate-ciliate on the margins; calyx tubular, membranous, about 1 mm. long, deeply 2-lobed, lanate, the lobes ovate, 2-veined, very obtuse; corolla hypocrateriform, white, the tube about 2.5 mm. long, incurved, attenuate below, somewhat ampliate above, short-lanate above, the throat 0.5 mm. wide, pubes-

cent, the limb with the posterior lobe entire, the anterior one elongate, 0.8 mm. long, rounded, all the lobes (except the anterior one) short-lanate on the outside, pubescent on the inner surface; stamens included, inserted 1.5 mm. above the base of the corolla-tube; anthers broadly elliptic; style more than twice as long as the ovary, incrassate above; stigma lateral, half as long as the style; ovary basal, ellipsoid, obsoletely puberulous, with a crown of short white hairs at the apex.

The type of this apparently rare species was collected by Spencer le Marchant Moore (no. 280) in thickets at Jangada, Matto Grosso, Brazil, flowering in September. An isotype was photographed by Macbride in the herbarium of the Botanisches Museum at Berlin as his type photograph number 17520, but is now destroyed.

Moore (1895) says of this species "Cum Lippiâ vernonioidi, Cham., rite componenda, cujus folia reverâ majora, firmiora, argutius dentata, spicae majores, bracteae itaque multo majores, corollas grandioris tubus longe diversus, etc."

I am not at all certain of the identification of the Glaziou collection cited below. The peduncles are only 5--8 mm. long and the heads are so woolly that they resemble a composite head. It is a mixture with L. microphylla Cham. and is so cited by Glaziou (1911). It should be noted that he collected this number at two localities, "Itabira do Campo et Biribiry", so this probably accounts for the mixture of two taxa under the same number.

In all, 1 herbarium specimen and 6 mounted photographs, including photographs of the type collection, have been examined by me.

Citations: BRAZIL: Matto Grosso: S. Moore 280 [Macbride photos 17520] (It--photo of isotype, Kr--photo of isotype, N--photo of isotype, N--photo of isotype, Ug--photo of isotype, W--photo of isotype). Minas Gerais: Glaziou 14155, in part (Br).

LIPPIA JANGADENSIS var. EITENORUM Moldenke, var. nov.

Haec varietas a forma typica speciei recedit caulibus foliisque inflorescentiisque dense longeque hispidis, foliis usqua ad 13 cm. longis 5 cm. latis crasse serratis.

This variety differs from the typical form of the species in having its stems, petioles, leaf-blades, peduncles, rachis, and flower-heads densely villous or hispid, the hairs wide-spreading on the stems, petioles, and sympodia, more appressed on the peduncles and flower-heads; the leaf-blades are to 13 cm. long on the lower parts of the stem and to 5 cm. wide.

The type of this handsome variety was collected by George and Liene Teixeira Eiten (no. 4426) -- in whose joint honor it is named -- in "chapada" on the south slope of the deep and wide brook-valley called Vão das Traíras, in the Municipio de Lorêto, "Ilha de Balsas" region, between the Rios Balsas and Paranîba, about 2 km. south of the main house of Fazenda "Morros", about 35 km. south of Lorêto, at about 300 meters altitude, Maranhão, Brazil, on April 27, 1962, and is deposited in the United States National Herbarium at Washington. The collectors note that the

plant is herbaceous, 1.5 m. long, slightly inclined, or erect and 0.5 m. tall; the flower clusters are 11 mm. in diameter; in the same clusters are flowers with all white corollas and some with golden-yellow throats. It is known thus far only from the type collection, of which I have examined 4 herbarium specimens and 2 mounted photographs.

Citations: BRAZIL: Maranhão: Eiten & Eiten 4426 (W--2445204--clastotype, W--2445205--clastotype, W--2445207--type, Z--isotype, Z--photo of type, Z--photo of clastotype).

LIPPIA JAVANICA (Burm. f.) Spreng. in L., Syst. Veg., ed. 16, 2: 752. 1825.

Synonymy: Verbena javanica Burm. f., Fl. Ind. 12, pl. 6, fig. 2. 1768. Blairia javanica (Burm. f.) Gaertn., Fruct. & Sem. Pl. 1: 265--266, pl. 56. 1788. Zapania javanica (Burm. f.) Lam. ex Poir. in Lam., Tabl. Encycl. Méth. Bot. [Illustr. Gen.] 1: 59. 1791. Verbena capensis Thunb., Fl. Cap. 96. 1800. Blairia javanica Gaertn. ex Steud., Nom. Bot., ed. 1, 111, in syn. 1821. Lippia capensis (Thunb.) Spreng. in L., Syst. Veg., ed. 16, 2: 751. 1825. Lippia javanica Spreng. ex Steud., Nom. Bot., ed. 2, 2: 54. 1841. Lippia capensis Spreng. ex Steud., Nom. Bot., ed. 2, 2: 54. 1841. Verbena javanica Burm. ex Steud., Nom. Bot., ed. 2, 2: 54, in syn. 1841. Zapania javanica Poir. ex Steud., Nom. Bot., ed. 2, 2: 54, in syn. 1841. Zappania javanica Poir. ex Steud., Nom. Bot., ed. 2, 2: 797, in syn. 1841. Verbena odorata Desf. ex Steud., Nom. Bot., ed. 2, 2: 54 & 750, in syn. 1841 [not V. odorata L'Hér., 1941, nor Meyen, 1834, nor Meyer, 1946, nor Pers., 1821]. Lippia scabra Hochst. ex F. Krauss, Flora 28: 68. 1845. Zapania javanica Lam. apud Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 1248. 1895. Lantana galpiniana H. H. W. Pearson in Thiselt.-Dyer, Fl. Cap. 5: 189. 1901. Lippia asperifolia L. C. Rich. ex Pulle, Pl. Surin. 401. 1906 [not L. asperifolia Benth., 1947, nor Hochst., 1947, nor H.B.K., 1863, nor Poepp., 1832, nor Reichenb., 1828, nor A. Rich., 1801]. Zapania javanica (Burm.) Lam. ex Moldenke, Prelim. Alph. List Invalid Names 54, in syn. 1940. Lippia asperifolia var. anomala Moldenke, Suppl. List Invalid Names 5, in syn. 1941. Lantana galpingiana H. H. W. Pearson ex Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 52 & 94, sphalm. 1942. Verbena nodiflora arborescens Mart. ex Moldenke, Alph. List Invalid Names Suppl. 1: 25, in syn. 1947. Verbesina capitata Harv. ex Moldenke, Alph. List Invalid Names Suppl. 1: 28, in syn. 1947. Verbena arborescens Bojer ex Moldenke, Résumé 357, in syn. 1959. Verbena capitata Hort. ex Moldenke, Résumé 361, in syn. 1959 [not V. capitata Blanco, 1877, nor Blume, 1960, nor Forsk., 1775]. Lantana javanica Burm. f. ex Moldenke, Résumé Suppl. 3: 32, in syn. 1962. Lippia javanica Burm. f. ex Moldenke,

Résumé Suppl. 3: 32, in syn. 1962. Verbena capensis L. ex Moldenke, Résumé Suppl. 9: 5, in syn. 1964. Lantana salviflora Jacq. ex Moldenke, Résumé Suppl. 11: 7, in syn. 1964. Lippia asperifolia Marthe, in herb.

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Moldenke, Résumé Suppl. 2: 12. 1960; Anon., Assoc. Etud. Tax. Fl. Afr. Trop. Index 1960: 60. 1961; Cockbill, Rhod. Agric. Journ. 58 (3): 173--177. 1961; Moldenke, Phytologia 8: 130, 131, 134, 136, & 137 (1961) and 8: 255 & 256. 1962; Cuf., Bull. Jard. Bot. Brux. 32: Suppl. 791. 1962; Cockbill, Weed Abstr. 11 (3): 158. 1962; Moldenke, Résumé Suppl. 3: 16, 32, & 33. 1962; H. P. Riley, Fam. Flow. Pl. S. Afr. 129. 1963; Moldenke, Phytologia 9: 389 & 393 (1963) and 10: 91. 1964; Moldenke, Résumé Suppl. 8: 2, 5, & 6 (1964), 10: 5 (1964), and 11: 6 & 7. 1964; Moldenke, Phytologia 12: 24, 42, 48, 56, 57, 62, 63, 90, 97, 98, 106, & 115. 1965.

Illustrations: Burm. f., Fl. Ind. pl. 6, fig. 2. 1768; Gaertn., Fruct. & Sem. Pl. 1: pl. 56. 1788; Poir. in Lam., Tabl. Encycl. Méth. Bot. [Illustr. Gen.] 1: pl. 17, fig. 2. 1791; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): fig. 58 C & D. 1895.

Tall woody and bushy shrub, subshrub, or treelet, thin, 0.7--5 m. tall, sometimes small and compact, a small spreading or medium-sized bush, or even a shrubby spreading herbaceous perennial, erect, loosely many-branched from the base, coarsely and strongly scented or pungently aromatic throughout, the odor somewhat sour but pleasant; stems woody, terete to subangular or tetragonal, dark-purple toward the tip, striate, scabrid-pubescent, covered with short stiff whitish hairs; leaves decussate-opposite, ternate, or in 4's, short-petiolate or sessile, rough, pleasantly odorous or aromatic, the new ones appearing in early spring; leaf-blades gray-white or somewhat gray-green, oblong or oblong-lanceolate to lanceolate, 2--5 cm. long, 6--15 mm. wide, acute to subacute or obtuse at the apex, acute or subacuminate to cuneate at the base, regularly serrate to crenate-serrate or crenate along the margins from the apex almost to the base with very small appressed teeth, very rugose and scabrous or scabrid-pubescent above with very short white strigose hairs, scabrellous and densely or sparsely short-pubescent beneath with white bulbous-based hairs especially on the prominulent midrib and secondaries; venation impressed above, the primary veins 4--7 on each side, ascending, prominent beneath; inflorescence axillary, not forming terminal corymbs above the leaves, 1--4 per axil, not more than 6 per node, ternate when the leaves are ternate; peduncles 0.6--4.5 cm. long; heads small, dense, to 1.7 cm. long and 6 mm. wide at the base, at first globose, finally cylindric, elongating after anthesis and spicate, the axis pubescent; bractlets broadly ovate or obovate to slightly obcordate, 2--3 mm. long, deeply concave, 1.5--3 mm. wide, not surpassing the flowers, cuspidate or very short-apiculate to shortly and abruptly acuminate or caudate-acuminate at the apex, silky-pubescent and glandular beneath, glabrous above; flowers small, fragrant with a distinct acid smell like that of Mangifera indica; calyx 1.25--2 mm. long, subbilobed or subtruncate, compressed, densely pubescent outside, glabrous inside, the lobes shorter than the tube, subacute to obtuse or rounded at the apex; corolla hypocrateriform, white, greenish-white, or cream to yellowish-white or yellow, sometimes whitish and violet or yellow in the throat, 3--4 mm. long, scarcely surpassing the subtending bractlets, glandular-pubescent

outside on the upper part, more densely so in the lateral areas, glabrous or minutely pubescent within, the tube 1.75--2.5 mm. long, 1.5 mm. in diameter, hairy above, glabrous at the base, sometimes yellow with the limb white or purple, the posterior lobe broadly triangular, somewhat cordate at the base, smaller than the anterior one, the middle lobe of the lower lip 1--1.5 mm. wide; stamens didynamous; anthers less than 0.25 mm. long or to 0.5 mm. long; style 0.75--1 mm. long; ovary glabrous; fruit very small, light-brown, oblong, plano-convex, flattened at the commissure.

The type of this perplexing species was collected by Nicolaas Laurens Burman from cultivated material in Java, and is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques in Geneva. The type of L. asperifolia var. anomala is an unnumbered specimen in the Persoon Herbarium, from cultivated material gathered in France, and deposited as sheet no. 908,263--483 in the Leiden herbarium. The type of L. galpiniana was collected by D. F. Gilfillan (no. 29; Galpin 6165) at Johannisburg, South Africa. Verbena nodiflora arborescens is based on an unnumbered collection made by Carl Friedrich Philipp von Martius in the Jard. des Plantes at Paris and deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels. Lantana salviflora is based on Dehn 53 from Southern Rhodesia, deposited in the Government Herbarium at Salisbury.

For Verbena capensis Thunb. the "Index Kewensis" on page 1178 says "bonariensis, Lippia asperifolia", but it cannot possible be Verbena bonariensis L. nor from Buenos Aires, Argentina. Thunberg's original description is "capensis. V. diandra spicis oblongis solitariis axillaribus hirsutis, foliis ovatis rugosis crenatis". It seems definitely to be the African plant here discussed as Lippia javanica.

There is much diversity of opinion as to whether or not this African plant is conspecific with the American L. alba (Mill.) N. E. Br. Certainly they are extremely closely related and are both apparently very variable in their characters. Steudel (1841) regarded them as distinct, while Schauer (1847, 1851) did not. In his 1821 work Steudel lists Blairia javanica as an unaccepted name and refers it to Verbena, but under the genus Verbena on page 873 of the same work he fails to list it! Schauer (1851) says "Rigoroso examine discrimen inter plantam Americanam et Africanam allud detegere non contigit, nisi quod in Africana bracteae essent magis acuminatae, flores paullo majores." Both Richter (1835) and Peterman (1840) place Verbena javanica in the synonymy of Phyla nodiflora (L.) Greene, which is certainly erroneous. Briquet (1895) says "L. asperifolia Rich.....in Brasilien, Guyana, Venezuela etc. häufig, kommt auch am Kap und längs der südöstlichen Küste Afrikas vor, wo es aber wohl eingeschleppt worden ist."

Meeuse (1942) includes under L. javanica the following names as synonyms: Verbena javanica Burm. f. [1768], Lantana alba Mill. [1768], Verbena globiflora L'Hér. [1786], Zapania odoratissima Scop. [1786], Blairia javanica (Burm. f.) Gaertn. [1788], Zapania lantanoides Lam. [1791], Zapania javanica (Burm. f.) Lam. [1791], Zapania globiflora (L'Hér.) Willd. [1797], Verbena capensis Thunb. [1800], Lantana lavandulacea Willd. [1800], Lippia asperifolia A. Rich. [1801], Zapania globiflora A. L. Juss. [1806], Zapania odorata Pers. [1806], Lippia geminata H.B.K. [1818], Lantana geminata (H.B.K.) Spreng. [1825], Lippia capensis (Thunb.) Spreng. [1825], and Lippia alba (Mill.) N. E. Br. [1925]. Many of these names, however, must go to the synonymy of L. alba if that taxon is kept distinct, as it is by me. Cufodontis (1962) follows Meeuse in uniting the African and American plants, and he follows Brenan (1954) in reducing L. whytei Moldenke to this aggregate superspecies, too. He notes "Mirabile dictu, cl. MEEUSE 1942 teste, haec species in Java ipsa nunquam visa est."

In a letter to me from Dr. Meeuse, dated September 28, 1953, he says: "I am inclined to believe that Pearson's L. rehmannii, L. wilmsii, L. bazeiana and L. pretoriensis can hardly be different from 'L. asperifolia' (=L. javanica)". In a letter dated December 9, 1953, he says "First of all, I noticed that you list L. javanica from Africa only and the related L. alba for America. When I examined the type of L. javanica many years ago, I was under the impression that L. alba and L. asperifolia were full synonyms, so that I hope that you studied the type of L. javanica at Geneva yourself and did not decide on my authority that the epithet javanica applies to African plants." A photograph of this type to which he refers here is cited below and indicates without any possibility of doubt that the plant is L. javanica, not L. alba.

Miss J. L. Warren, in a letter to me dated July 5, 1961, says "I am still not satisfied as to the characteristics which have been used to separate Lippia wilmsii Pearson from Lippia javanica (Burm. f.) Spreng."

Pearson (1901) also regarded the American and African plants as conspecific, giving as additional synonyms for the African element: Verbena globiflora L'Hér., Zapania odoratissima Scop., Z. lantanoides Lam., Z. odorata Pers., Z. globiflora Poir., and Lantana lavandulacea Willd., all of which belong in the synonymy of Lippia alba. Brenan (1954) is apparently not so sure that the Old and New World plants are conspecific. Under L. javanica he says "A common plant in many parts of east tropical Africa, ranging from Abyssinia south to Cape Province and west to Angola. ?Also in tropical America, India, and Australasia. I have followed A. D. J. Meeuse (Blumea 5: 68. 1942) in using the name Lippia javanica for a plant better known to students of the African

flora as Lippia asperifolia A. Rich. A complete synonymy will be found in the article cited, to which I have added Lippia whytei Moldenke, since this plant appears to me to be scarcely more than a narrow-leaved, subsessile-flowered form of L. javanica. At the same time, I should point out that the American and Indian specimens in the Kew herbarium, labeled L. javanica, L. alba, and L. geminata, differ from the African plant in having strictly geminate inflorescences, and larger pink or mauve corollas. It may be that the type-specimen of L. javanica agrees with the American rather than the African material, but until it has been examined, I am not prepared to make a change in the proposed nomenclature. Verbena globiflora L'Hérit. and Zappania odoratissima Scop. are, to judge from the figures given by these authors, conspecific with the African plant."

It should be mentioned here that some authors cite J. Burm. in Plum., Pl. Amer. 60, pl. 71, fig. 2 (1755) to the species here under discussion, but I feel that the "Lantana inermis foliis oppositis, ovatis" illustrated there is Lantana jamaicensis Britton and has nothing to do with N. L. Burman's Verbena javanica.

It should also be noted here that the Lippia asperifolia of Bentham and of Reichenbach, mentioned in the synonymy above, belong in the synonymy of Phyla scaberrima (A. L. Juss.) Moldenke; that of Hochstetter is Lippia baumii Gürke; and that of Poeppig, A. Richard, and Humboldt, Bonpland, & Kunth are L. alba (Mill.) N. E. Br.; the Verbena capitata of Blanco, of Blume, and of Forskål is Phyla nodiflora (L.) Greene; the Verbena odorata of L'Héritier and of Persoon is Lippia alba (Mill.) N. E. Br., while that of Meyen and of Meyer is Verbena laciniata (L.) Briq. The name, Lippia asperifolia argentiniensis Gill. & Schau., is a synonym of L. grisebachiana Moldenke, while Verbena capensis folio capillacea Ray and V. capensis f. capillaris Ray are Hebenstretia erinoides L. f. in the Selaginaceae.

Baker (1900) separates the tropical African species of Lippia known to him as follows:

1. Bractlets orbicular, obtuse.
  2. Peduncles very short.....L. oatesii.
  2a. Peduncles long.....L. radula.
1a. Bractlets acute, acuminate, or cuspidate, not orbicular.
  3. Bractlets cuspidate.
    4. Leaves small.
      5. Leaves orbicular or obovate.....L. somalensis.
      5a. Leaves oblong, rugose.....L. javanica.
    4a. Leaves larger, oblong or oblanceolate-oblong, scarcely rugose.....L. abyssinica.
  3a. Bractlets acute or acuminate.
    6. Bractlets acuminate.
      7. Leaves decussate-opposite.....L. ukambensis.

7a. Leaves ternate.....L. burtonii.
6a. Bractlets acute.....L. plicata.

Pearson (1901) differentiates the related South African species as follows:

1. Calyx distinctly 2-lobed.
2. Bractlets more than 4 mm. long and 3 mm. wide, surpassing the flowers.....L. scaberrima.
2a. Bractlets less than 4 mm. long and 3 mm. wide, not surpassing the flowers.....L. javanica.
1a. Calyx truncate, subtruncate, or obscurely lobed.
3. Leaf-blades serrate or crenate-serrate.
4. Bractlets more than 4 mm. long; calyx truncate or obscurely 4-toothed.....L. wilmsii.
4a. Bractlets less than 4 mm. long; calyx obscurely 2-lobed.....L. rehmanni.
3a. Leaf-blades crenate.....L. pretoriensis.

Although Pulle (1906) records a "L. asperifolia L. C. Rich.", from Surinam, he is actually referring to L. asperifolia A. Rich., a synonym of the American L. alba (Mill.) N. E. Br. Pearson (1905) states that his L. pedunculata differs from what we now know as L. javanica in having a 4-toothed calyx, larger bractlets and spikes, and less hairy, rougher, and larger leaves.

Schauer (1847) places our plant in his Subsection Axilliflorae of Section Zapania. It has been found by collectors in grassy places and grasslands, steppes and grass steppes, open woods, cultivated soil, low veld bush on riverbanks, coastal bush on white sand, and semi-closed bush country, on dry hillslopes and shaley ridges, sandy flats, granite kopjes, and quartzite in ravine bottoms, along fencerows, among rough grass, at the edge of thickets and bush, bordering grasslands, and growing in the open, at altitudes of sea-level to 2400 meters, flowering from October to August, fruiting from February to June and in August and October. Quarré refers to it as "very common in almost all kinds of soil" in the Congo; Van Nouhuys & Obermeyer call it "common" in the Transvaal; Hornby says that it is "occasional in Brachystegia-Isoberlinia woodland on light red soil" in Southern Rhodesia; while in Nyasaland it is said to be "occasional" by Wiehe and "frequent in Brachystegia woodland on mountain slopes" by Brass. Wild found it to be frequent in red soil areas; Swynnerton calls it a "common tall weed"; Eyles refers to it as a "roadside weed"; Mogg found it "abundant on valley sides"; Bogdan calls it "common in bush"; while Maas-Geesteranus reports it "scarce among tall grasses at edge of forest on grassy slope near stream with scattered shrubs" and "rather common in savanna woodland along edge of forest with scattered Acacia lahai and extensive clumps of dense brushwood."

The corollas are said to be "yellow" on Wild 1829; "cream" on Richards 7515 and Wild 2997; "whitish and violet" on Quarré 4061;

"greenish-white" on Faulkner 2762; "yellowish-white, yellow in throat" on Maas-Geesteranus 5210 & 6364; "limb white or purple, tube yellow" on Gillett 14504; and "white" on Codd 5014, Eyles 278, Faulkner 2314, Mogg 13135, Peter 42284 & 43581, Quarré 1094, Robyns 1548, Rodin 3871, Sidey 3261, Tyson 930, Wood 13019, and Wylie s.n. [Natal Herb. 22408]. Rodin describes the fruit as "purple" (!), while Schlieben says that the leaves "stink".

Vernacular names recorded for the species are "fever-tea", "Java vervain", "kirehera", "kjulu", "kundukunoka", "m'fungofana", "mosukutswani", "mumara", "mushani", "mu shani omkulu", "mu-tswane," "nzala", "umshani-umkulu", "umsuawana", "um-suswane", "umzinzinibe", "vumke", "zimbani", and "zumbani".

It is said that the pleasantly odorous crushed leaves are used by the natives in Nyasaland for sweeping. Swynnerton reports that brooms are made of this and are used by the natives to drive fleas from their huts, and that the leaves are also chewed as a remedy for colic in Southern Rhodesia. Estêves de Sousa states that in Mozambique the natives employ the leaves as a tea or syrup in the treatment of coughs and against intestinal parasites. Riley (1963) says that it is employed in the treatment of a certain type of insanity.

It is worth noting that Krauss (1845) lists his no. 247 as "n. sp." Codd refers to his no. 699 as a shade form growing in a kloof (a narrow usually wooded gorge). Van Dam s.n. [III.1920] approaches L. pedunculata H. H. W. Pearson in characters; Leendertz s.n. [29-2-1904] is labeled "intermediate toward L. rehmannii". Zeyher s.n. is too young and fragmentary for proper determination and therefore is placed here only tentatively. F. A. Rogers 357 is a mixture with L. scaberrima Sond., while his 6547 is a mixture with Lantana viburnoides (Forsk.) Vahl. Bojer s.n., collected on Pemba Island, bears a printed label inscribed "Madagascar".

Cockbill (1961) tells us that L. javanica is particularly susceptible to a mixture of 26 percent of equal parts of 2,4D and 2,4,5-T butyl esters in kerosene to give 3 & 6 percent concentration of acid equivalent to control brush in areas cleared of vegetation to restrict the spread of the tsetse-fly.

Material has been misidentified and distributed in herbaria under the names L. adoensis Hochst., L. africana Moldenke, L. burtonii J. G. Baker, L. caffra Sond., L. dulcis Trev., L. nodiflora Michx., L. oatesii Rolfe, Lantana lavandulacea Willd., L. salviaefolia Jacq., L. salvifolia Jacq., L. salviifolia Jacq., Verbena odorata L'Hér., Zapania odorata Pers., and Zappania globiflora Poir. Peter 42873 was distributed as "Lippia n. sp. aff. burtonii"

On the other hand, the Hinton 13149 distributed as this species is actually L. alba (Mill.) N. E. Br., Venturi 36 is L. asperrima Cham., Gossweiler 13439 is L. pearsoni Moldenke, Pedersen

1163 is L. recolletae Morong, and Quarré 87 is L. whytei Moldenke.

Schauer (1851) cites Bojer s.n. from Zanzibar, as well as Ecklon 10 & 11 and Drège s.n. from Cape of Good Hope. Baker & Stapf (1900) cite the following: ETHIOPIA: Roth 10 & 523. CONGO LEOPOLDVILLE: Descamps s.n. [Mtowa]. TANGANYIKA: Hoist 8893; Thomson s.n. [Lower Plateau, north of Lake Nyasa]; Volkens 218. ZANZIBAR: Bojer s.n.; Hildebrandt 995. KENYA: Scott-Elliot 6331; Thomson s.n. [Kapte Plateau]. ANGOLA: Welwitsch 5749 & 5750. SOUTHERN RHODESIA: Elliott s.n. [Matabeleland]; Oates s.n. [Matabeleland]. NYASALAND: Whyte s.n. [Mount Chiradzulu]. PORTUGUESE EAST AFRICA: Mozambique: Forbes s.n.; Kirk 71, s.n. [at the foot of Morambala Mountain], & s.n. [Shupanga]; Meller s.n. [Lower Valley of the River Shire].

Pearson (1901) cites the following: SOUTH AFRICA: Cape of Good Hope: Cooper 156; Hutton s.n. [Eastern frontier]; Mrs. Hutton s.n. [Keis Kamma]; Kuntze s.n. [Krantz Kloof]; MacOwan 503 & s.n. [in thickets near Grahamstown]; Tyson s.n. [MacOwan & Bolus 848]. Natal: Bowker 276; Cooper 1006; Gerrard 61 & 635; Gerrard & McKen 638; Grant s.n.; Krauss 247; Sanderson 97; Sutherland s.n. [coast land]; Wood 32. Transvaal: Wilms 1182. Province undetermined: Drège s.n. Chevalier (1913) cites his numbers 6556, 6619 bis, & 7014 from Ubangi-chari in the Central African Republic.

In all, 190 herbarium specimens and 7 mounted photographs, including type or phototype material of most of the names involved, have been examined by me.

Citations: ETHIOPIA: J. B. Gillett 14504 (B). CONGO LEOPOLDVILLE: De Giorgi s.n. [envir. Elisabethville, 1923] (Br); De Witte 469 (B); Herb. Ecole Salésiens S.706 (Br); Quarré 87 (Br, N), 1094 (Br), 4061 (Br), 4075 (Br), 4486 (Af); Ringoet 424 (Br); Robyns 1548 (Br, Br, Br); RRPP. Salésiens S.288, in part (Br). UGANDA: Mailland 1200 (K); Mearns 256 (N); G. H. S. Wood 433 (B). TANGANYIKA: Busse 2457 [A. Peter 51824] (Br), 3106 (Br), 3457 (B); Grote s.n. [A. Peter 51811/51823; 2.I.1913] (B, B); A. Horn s.n. [Mai 1912] (V—1034); Mrs. Hornby 40 (K); Mücke 175 (Af); A. Peter 1618 [O.I.39] (B), 1618a [O.I.39] (B), 2229 [O.I.56] (B, B), 2666 [O.I.63] (B), 2737 [O.I.65] (B), 42526 [V.288] (B), 42284 [V.283] (B), 42873 [V.299] (B), 43370 [V.306] (B), 43581 [V.315] (B, B), 44096 [V.324] (B), 46707 [V.283] (B), 51792 [O.IV.76.I] (B); Mrs. H. M. Richards 7515 (S); Schlieben 319 (B, S). PEMBA ISLAND: Bojer s.n. (P). ZANZIBAR: Collector undesignated 125 (T); H. G. Faulkner 2314 (S), 2762 (S); E. H. L. Krause 16813 (B); Paulay s.n. [Zanzibar, Aug. 1887] (V—10013, V—10014). KENYA: A. Bogdan B.29 (Ca—943462); Granvik 63 (S); Lindblom s.n. [Machakos] (S); Maas-Geesteranus 5210 (Ca—92330, S), 6364 (Ca—92526, S); E. Wall 9

(Go). NORTHERN RHODESIA: Gairdner 406 (K). SOUTHERN RHODESIA: C. E. F. Allen 497 (Rh); J. Borle s.n. [25.1.21] (K); Brain 5536 (Bm, N); N. C. Chase 208 (Rh--14735); Corby 667 [Govt. Herb. Salisbury 29517] (N); Dehn 53 (Rh--8787); F. Eyles 278 (Rh); Hack 45/50 (Rh--27191); Hislop 40 (K); J. C. F. Hopkins s.n. [Govt. Herb. S. Rhodesia 7969] (N); R. M. Hornby 3221 [Govt. Herb. Salisbury 32893] (Bm, N); R. W. Jack 97 (Rh--11954); A. Newton 62 (Rh--19517); Pierson s.n. [29.4.31] (Rh--4003); Swynnerton 475 (Rh); A. J. Teague 229 (K); Wild 1829 (Rh--16175), 2997 (Rh--25194). NYASALAND: Brass 16029 (N); Laurence 353 (K); Wiehe N.488 [Govt. Herb. Salisbury 28305] (N). PORTUGUESE EAST AFRICA: Mozambique: Estêves de Sousa 157 (Af); A. Peter 30519 [V.17] (B); F. R. R. Schlechter 12230 [Herb. Hort. Then. I.5161] (Br). Quelimane: H. Faulkner 42 (S). BECHUANALAND: F. A. Rogers 6547, in part (S). SOUTH AFRICA: Cape of Good Hope: Drège s.n. [zwischen Keiskamma und Buffelrivier] (S); Ecklon & Zeyher 10 & 11 (S, S); Gilfillan 29 [Galpin 6165] (Af, N--photo); Herb. Swartz s.n. (S, S); Krook s.n. [Penther 1792] (S); Kuntze s.n. [King Williams Town, 1/3/94] (N); Mogg 13135 (Ss); Pappe s.n. [Buffalo R.] (S); Sidey 638 (S); L. E. Taylor 1817 (Af); Tyson 980 (Af), s.n. [MacOwan & Bolus 848] (Vt); Wahlberg s.n. [Cap. B. Spei] (S); E. Wall 10, in part [2/10/38] (Ew), 10, in part [7/11/38] (Ew), 10, in part (Ew), s.n. [20/10/38] (Ew); Zeyher s.n. (S). Natal: Gueinzius 412 (S); Kuntze s.n. [Kranz Kloof, 12/3/94] (N); Mogg 1180 (Af), 4397 (W--1425525), 6002 (Af); Rudatis 618 (Af, S); Sanderson 97 (S); F. R. R. Schlechter 2873 (Br, S), 2875 (S); Sidey 3261 (S, W--2317835); J. M. Wood 13019 (Af, Vt), s.n. [10-3-1915] (Vi); Wylie s.n. [Natal Herb. 22408] (Gg--224156). Transvaal: J. P. H. Acock 11336 (Cb); Acocks 12410 (Af); W. G. Barnard 15 (Af); Barnard & Mogg 744 (Cb); Cholmondeley s.n. [Nov. 1933] (Cm); L. E. Codd 699 (Ss), 5014 (Ss), 6554 (Af), 7941 (Af); M. Collins 160 (Cb); D'Estourgies s.n. [1877] (Br, Br, Br, Br, Br, Br); Dyer 3960 (W--1940593); E. E. Galpin 14421 (Cb, N); Haptröm & Acock 1323 (S, S); Junod 4335 (Af); Leendertz s.n. [29-2-1904] (Z); Meeuse 9042 (Af); Mogg 16825 (Cb), s.n. [6.3.39] (N), s.n. (S); Obermeyer, Schweickerdt, & Verdoorn 7 (Cb), 129 (Cb); Pole-Evans 32 (S); Rodin 3871 (W--1991406); F. A. Rogers 357, in part (S); Schlieben 7011a (B, N, W--2272015); Schweickerdt 1222 (Af, S); C. A. Smith 359 (Af), 6153 (Af, Ss); Van Dam s.n. [III.1920] (Cb); Van den Schyff 3426 (Cb); Van Nouhuys & Obermeyer s.n. [Herb. Transvaal Mus. 27669] (N); Van Warenlo 68 [Herb. Transvaal Mus. 37961] (Af); E. Wall s.n. [2/10/38] (S), s.n. [5/10/38] (S), s.n. [17/10/38] (S); Wasserfall & Niekerk 15, in part (Af); Watt & Brandwijk 990 (Af). CULTIVATED: France: Herb. W.

H. Harvey s.n. [h. P., Aug. 1850] (Du--166582), s.n. [du jardin de Paris, Aug.] (Du--166477); Herb. Hort. Audibert s.n. (K); Herb. Jewett s.n. (Mi); Herb. Lugd.-Bat. 20935-242 (Le, N--photo, Z--photo), 908263-482 (Le); Herb. Martius s.n. [h. R. P.] (Br); Herb. Mus. Bot. Stockholm s.n. (S); Herb. Persoon s.n. (Le--908263-483, N). Java: Burman s.n. (Cb--type, N--photo of type); Collector undesignated s.n. [Klinhoff] (Cb, N--photo). LOCALITY OF COLLECTION UNDETERMINED: Collector undesignated 34 (Br); Herb. Linnaeus G.35, S.10a (Ls, N--photo, Z--photo); Herb. Martius s.n. (Br); Louis 230 [N. Marico] (Af).

LIPPIA JUNELLIANA (Moldenke) Troncoso, Darwiniana 10: 75--78, fig. 3. 1952.

Synonymy: Lippia lantanifolia var. crenata Griseb., Abhand. Kais. Gesell. Wiss. Götting. 19: 243. 1874. Lippia crenata (Griseb.) Kuntze, Rev. Gen. Pl. 3 (2): 251. 1898 [not L. crenata Pearson, 1959, nor Sessé & Moc., 1894]. Lippia crenata Kuntze apud Thiselt.-Dyer, Ind. Kew. Suppl. 2: 106. 1904. Lantana junelliana Moldenke, Phytologia 1: 279. 1938.

Bibliography: Griseb., Abhand. Kais. Gesell. Wiss. Götting. 19: 243. 1874; Griseb., Pl. Lorentz. 195. 1874; Kuntze, Rev. Gen. Pl. 3 (2): 251. 1898; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 106. 1904; A. W. Hill, Ind. Kew. Suppl. 7: 139, 1929; Seckt, Fl. Cordob. 417. 1929-1930; Seckt, Rev. Univ. Nac. Cordoba 17: 89. 1930; Moldenke, Phytologia 1: 279 (1938) and 1: 413. 1940; Moldenke, Lilloa 6: 321 (1941) and 8: 422. 1942; Moldenke, Alph. List Invalid Names 30 & 31. 1942; Moldenke, Alph. List Cit. 1: 96 (1946) and 2: 442. 1948; Moldenke, Lilloa 14: 35 & 36. 1948; Moldenke, Alph. List Cit. 4: 1190. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 104 & 188. 1949; Troncoso, Darwiniana 10: 75--78, fig. 3. 1952; G. Taylor, Ind. Kew. Suppl. 12: 82. 1959; Moldenke, Résumé 125, 311, 313, & 459. 1959; Moldenke, Résumé Suppl. 7: 6 & 8 (1963) and 8: 4. 1964; Moldenke, Phytologia 12: 56. 1965.

Illustrations: Troncoso, Darwiniana 10: 76, fig. 3. 1952.

Fragrantly aromatic much-branched shrub or subligneous subshrub, 0.8--2 m. tall; stems cylindric, with gray bark, straight or arcuate, rigid, subtetragonal, finely pubescent toward the apex, otherwise glabrous, with smooth reddish-brown bark; leaves decussate-opposite, petiolate; petioles 4--7 mm. long, pubescent; leaf-blades oval-lanceolate, 2--7 cm. long, 1--3 cm. wide, subacute or rounded at the apex, finely and regularly crenate along the margins except at the base, subcuneate at the base, penninerved, rugose and hirsute-pubescent above with short hairs that are callose-based along the edges and at the apex of the leaf, densely canescent beneath and glandular-punctate beneath the pubescence; venation impressed above, prominent beneath, conspicuously reticulate on both surfaces; inflorescence axillary, pedunculate; peduncles solitary, 1.5--5 cm. long; heads dense, the bractlets and flowers easily caducous; outer bractlets lanceolate, 6--7 mm.

long, 2--3 mm. wide, venose, pubescent, ciliate-margined; calyx tubular, 4--4.8 mm. long, 2-lipped, each lip 1--3-dentate with short teeth, easily separated into 2 halves, pubescent on the upper third with long dense matted hairs, with a lanate aspect on the lower 2/3, glandular-punctate beneath the pubescence; corolla hypocrateriform or tubular, violet or red-violet to lilac, rose-lilac, or rose, 2-lipped, the tube pubescent on the outside on the upper half, glabrous on the lower half, the limb with the upper lip short and 2-lobed, the lower lip much larger and 3-lobed; stamens and pistil typical of the genus; fruit dry, oval, 1.8--2 mm. long, 1--1.2 mm. wide, smooth, 2-celled, the cells 1-seeded, but usually 1 seed semi-atrophied, easily separated into 2 mericarps, each 1-celled, the young fruit with a thin layer of endosperm which disappears when the fruit is mature.

The type of this interesting species was collected by Günther Lorentz in woods and thickets near Ascochinga, Córdoba, Argentina, flowering in August. The original description reads "L. lantanifolia var. crenata Griseb. foliis crenatis (in α argute serrata sunt). Cordoba, in sylvis et fruticetis pr. Ascochinga."

The L. crenata of Pearson is a synonym of L. pretoriensis H. H. W. Pearson, while that of Sessé & Mocino is L. alba (Mill.) N. E. Br. Troncoso (1952) comments: "Moldenke.....pasó esta especie al género Lantana, bajo L. Junelliana. Su fruto, muy similar al de L. Grisebachiana y su cáliz característico de Lippia, hacen que los considere pertenecientes al misma género, hasta que un estudio monográfico permita delimitar con claridad estos géneros, Lantana y Lippia.....Muchos de los ejemplares fructíferos presentan el fruto parasitado por un insecto cuya larva desarrolla en el interior del ovario, presentándose la flor atrofida y retorcida da dentro del cáliz ligeramente hinchado."

The plant has been collected on hills near limestone quarries, hilltops, mountaintops, at the edges of woods, and in woods and thickets, at altitudes of 490 to 1200 meters, flowering and fruiting from November to May and in September. Digilio & Grassi 2033 is placed here tentatively. It may possibly represent a hybrid with L. turbinata Griseb.

The flowers of L. junelliana are described as "lilac" on Giardelli s.n. [12.XI.1935], Hunziker 8002, and Terribile 736, "rose-lilac" on Burkart 10408, "violet" on Venturi 815, "red-violet" on Osten 10614 & 13109, and "rose" on Cuezzo 919, and "limb rose-lilac" on Hunziker 6736, while Troncoso 302 is described as having "flowers lilac at edge, yellowish-white in center".

Material of this species has been misidentified and distributed in herbaria under the names Lippia lantanifolia Griseb. and Lantana sellowiana Link & Otto.

In all, 54 herbarium specimens and 3 mounted photographs have been examined by me.

Citations: ARGENTINA: Buenos Aires: Née 6 (Q). Córdoba: H. H.

Bartlett 20072 (Ca--772481, Mi, W--1904838); Bruch 8233 (N), s.n. [Unquillo, III.1926] (S); Burkart 10408 (N), 20386 (Ca--86379); Castellanos s.n. [Herb. Mus. Argent. Cienc. Nat. 11667] (N), s.n. [Herb. Mus. Argent. Cienc. Nat. 11668] (N), s.n. [Herb. Mus. Argent. Cienc. Nat. 31199] (N); Cuezzo 751 (N), 919 (N, S); M. Escalente 16 (W--1987973); Giardelli 118 (W--2056260), 157 (W--2056261), s.n. [Ascochinga, 12.XI.1935] (N); G. Hieronymus 840 [Macbride photos 17500] (Kr--photo, N--photo, W--photo), s.n. [Sierra Chica, 14.1.1876] (Br, N), s.n. [San Vicente, XII.1876] (W--281550), s.n. [Córdoba, X.1929] (Br); A. T. Hunziker 6736 (N, N), 8002 (N), s.n. [6-IX-1946] (Vi); Kuntze s.n. [Dique bei Córdoba, XII.91] (N, N); T. Meyer 13304 (N); Nicora 876 (W--2056265); O'Donell & Rodriguez 484 (Ut--115402b); Osten 10614 (Ug), 13109 (Ug); Rodrigo 2313 (N); Ruíz Leal 12508 (Z); Scolnik 46 (N); Sparre 1404, in part (S); Terribile 718 (N), 736 (N, Vi); Troncoso 302 (Ca--1003489, N, W--1858384); Wall & Sparre s.n. [La Falda, 15/12/46] (Ew, Ew). La Rioja: Castellanos s.n. [Sierra Brava, Feb. 17, 1940; Herb. Mus. Argent. Cienc. Nat. 33896] (N). Salta: R. Aguilar 233 (Ca--1165488); Schreiter 6698 [Herb. Inst. Miguel Lillo 32706] (N), San Luis: Digilio & Grassi 2033 (N); Varela 642 (Ca); D. Wright s.n. [Los Molles, 1928] (Bm). Santiago del Estero: Pierotti s.n. [9/IV/1944] (W--1934012). Tucumán: Venturi 815 (W--1591231). Province undetermined: Née 128 (Q).

LIPPIA KITUIENSIS Vatke, Linnaea 43: 528 [as "L.? kituiensis"]. 1882.

Synonymy: Lippia kituensis Vatke apud K. Schum. in Just, Bot. Jahresber. 28 (1): 496, in syn. sphalm. 1902.

Bibliography: Vatke, Linnaea 43: 528. 1882; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 95. 1894; Gürke in Engl., Pfl. Ost-Afr. C: 338. 1895; K. Schum. in Just, Bot. Jahresber. 28 (1): 496. 1902; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 50 & 95 (1942) and [ed. 2], 118 & 190. 1949; Moldenke, Phytologia 3: 456 & 457. 1951; Moldenke, Résumé 142, 146, & 461. 1959.

Branches firm, strict, angulate, hispid-scaberulous; leaves decussate-opposite, petiolate; petioles to 1 cm. long; leaf-blades ovate- or oblong-lanceolate, to 5 cm. long and 2 cm. wide ["in folio unico non plane conservato ad 4 cm. lato"], obtuse at the apex, crenate along the margins, attenuate at the base, rugulose and scaberulous above or finally glabrate, hispid throughout beneath, densely so along the venation; inflorescence axillary, binary; peduncles to 2.5 cm. long; heads subglobose, bracteolate; bractlets spiral, oblong-linear, numerous, imbricate, forming an involucre which subequals the corolla-tubes; corolla white, about 5 mm. long and 4 mm. wide, the tube hispid, inflated above; fruit unknown.

The type of this poorly known species was collected by Johann Maria Hildebrandt (no. 2738) at Kitúi, in Ukamba, Kenya, in May,

1877. The plant has been collected in anthesis only in May. Schumann (1902) places the species in the synonymy of Lantana rugosa Thunb.

In all, 7 herbarium specimens and 1 mounted photograph of the type collection have been examined by me.

Citations: CONGO LEOPOLDVILLE: Quarré 2906 (Br, Br, Br, Br, Br, Br, N). KENYA: Hildebrandt 2738 (N--photo of isotype).

LIPPIA LACUNOSA Mart. & Schau. ex Schau. in A. DC., Prodr. 11: 590. 1847.

Synonymy: Lippia cordata Turcz., Bull. Soc. Nat. Mosc. 36 (2): 205. 1863. Lippia lacunosa Mart. ex Moldenke, Prelim. Alph. List Invalid Names 56, in syn. 1940.

Bibliography: Schau. in A. DC., Prodr. 11: 590. 1847; Turcz., Bull. Soc. Nat. Mosc. 36 (2): 205. 1863; Hiern, Vidensk. Meddel. Kjøbenh. 1877-1878: 100. 1877; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 95. 1894; Glaz., Bull. Soc. Bot. France 58, Mém. 3: 542. 1911; Moldenke, Prelim. Alph. List Invalid Names 56. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 37 & 95. 1942; Moldenke, Alph. List Invalid Names 30, 31, 223, & 238. 1942; Moldenke, Phytologia 2: 385. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 80 & 190. 1949; Moldenke, Alph. List Cit. 3: 689, 705, & 824. 1949; Moldenke, Résumé 93, 311, 313, & 461. 1959; Rennó, Levant. Herb. Inst. Agron. Minas 150. 1960; Moldenke, Résumé Suppl. 6: 6. 1963; Moldenke, Phytologia 12: 24. 1965.

Branched shrub, to 1.5 m. tall; stems corymbose-fasciculate above; branches and branchlets fastigiate, scabrous, the upper ones floriferous; leaves decussate-opposite, ternate, or approximate, subsessile, spreading, equaling or longer than the internodes, the blades rigid, ovate, 2.5--3 cm. long, 1.8--2.4 cm. wide, decreasing in size upwards, rather acute or obtuse at the apex, crenate along the margins, cordate at the base, shiny and very scabrous above, canescent, reticulate-venose, and scrobiculate beneath, the tomentum very sparse, the floral leaves very small; inflorescence axillary, solitary, racemose-congested at the apex of the branchlets; peduncles short; heads subspicate, many-flowered; bractlets subherbaceous, ovate, about 4 mm. long, short-acuminate at the apex, conspicuously 5-veined, subhirtellous-pubescent, loosely imbricate, half as long as the corolla-tube; calyx short, narrow, bifid, sericeous-villous, the lobes acute at the apex, 2-toothed; corolla lilac, hypocrateriform, hirtellous on the outside, the tube about 6 mm. long, transversely elliptic-truncate below, broadly unguiculate, the throat yellow.

This species is based on Pohl 131, from Ponte Sieto, Minas Gerais, Brazil, and apparently unnumbered collections of Lund, Martius, Riedel, and Sellow, all from "In campis deserti prov. Minarum Brasiliae", deposited in the herbaria at Berlin (now destroyed), Vienna, Leningrad, Munich, and Geneva (DeCandolle herbarium). The Pohl collection was photographed by Macbride in the herbarium of the Botanisches Museum at Berlin as his type photograph number 17521, but is now destroyed. The type of L. cordata

was collected by George Gardner (no. 4330) in Goías, Brazil. Schauer (1847) places the species in his Section Zapania, Subsection Corymbosae. He says (1851) "Proxima L. rotundifoliae a qua differt foliorum et bractearum figura atque magnitudina."

Lippia lacunosa has been collected in the grassy edges of woods, flowering in April and May. J. E. Pohl 186 is not typical in regard to its inflorescence, which is like that of L. rotundifolia Cham., to which the species is certainly closely related. Material has been misidentified and distributed in herbaria as L. rotundifolia Cham.

In all, 16 herbarium specimens and 5 mounted photographs, including type or phototype material of all the names involved, have been examined by me.

Citations: BRAZIL: Brasilia: Heringer 8195 (N); Murça Pires, Silva, & Souza 9409 (Z). Goías: G. Gardner 4330 (M, N); Glaziou 21896 (Br, S), 21897 (Br, N, S, W--1112530); Sena 2 [Herb. Inst. O. Cruz 219] (W--2342980). Matto Grosso: Malme 3385 (S), s.n. [Santa Anna da Chapada, May 27, 1903] (S). Minas Gerais: J. E. Pohl 131 [Macbride photos 17521] (It--photo of cotype, Kr--photo of cotype, N--photo of cotype, N--photo of cotype, W--photo of cotype), 186 (Br), 2959 (N). State undetermined: G. Gardner 5116 (W--702439).

LIPPIA LANATA Walp., Repert. Bot. Syst. 4: 43. 1845.

Bibliography: Walp., Repert. Bot. Syst. 4: 43. 1845; Schau. in A. DC., Prodr. 11: 593. 1847; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 95. 1894; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 17 & 95 (1942) and [ed. 2], 31 & 190. 1949; Moldenke, Résumé 37 & 461. 1959.

Subacaulescent perennial herb, cespitose, many-headed, from a woody rhizome, very densely white-lanate throughout, with the habit of a Plantago; internodes very short, 2.5--4 cm. long; leaves rosulate, opposite, rather thick, 2.5--4 cm. long, 1--1.2 cm. wide, cuneate, obtuse and obsoletely 3-dentate at the apex, attenuate at the base; inflorescence axillary, equaling the leaves, 1-headed; peduncles solitary, filiform, tetragonal, hardly longer than the leaves, white-lanate; heads subpyramidal-globose, 6--8 mm. long; bractlets obcordate, very densely lanate, the lower ones forming an involucre longer than the flowers, the upper ones shorter, all subacuminate at the apex; corolla flesh-color, hypocrateriform-tubular, shorter than the lower bractlets, glabrous, the throat villosulous, the limb 4-fid, one lobe larger and subemarginate at the apex; fruit drupaceous, obcordate-globose, subcompressed, girded by the membranous villosulous mature calyx, dark, lanuginous, apiculate with the base of the persistent style, 2-celled, the cells 1-seeded.

All that Walpers says about this species besides the above description is "Crescit in summis Andibus Mexicanis. (v.s.sp.)" It seems most unlikely that the plant is a Lippia or even verbenace-

ous. It is known to me only from the original description.

LIPPIA LANTANIFOLIA F. Muell., Fragm. 6: 151. 1868 [not L. lantanifolia Griseb., 1874].

Bibliography: F. Muell., Fragm. 6: 151. 1868; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 95. 1894; Moldenke, Phytologia 1: 279. 1938; Moldenke, Lilloa 5: 422. 1940; Moldenke, Phytologia 1: 504. 1941; Moldenke, Lilloa 10: 342 & 343. 1944; Moldenke, Castanea 13: 120. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 153 & 190. 1949; Moldenke, Résumé 209 & 461. 1959.

An erect shrub, a few feet tall, odorous; branches hirtous-pubescent and rough; leaves conspicuously petiolate; leaf-blades ovate or cordate-orbicular, 2--3.2 cm. long, obtuse at the apex, crenate-serrulate along the margins, rugose, paler green beneath; inflorescence axillary; peduncles single or sometimes binary, shorter than the leaves, 0.8--2.5 cm. long; heads ovate, densely imbricate; bractlets deltoid or orbicular-rhombic, herbaceous, acute or acuminate at the apex, the lower ones about 3 mm. long; calyx membranous, scarcely 2 mm. long, wingless, appressed-pubescent; corolla rather large, rose, the tube almost 4 mm. long, the upper lip almost semi-orbicular, entire, the lower lip with the central lobes half as long as the reniform-orbicular middle lobe; stamens included; filaments very short; anthers 4, cordate-globose; style very short; fruit globose, 2 mm. long, somewhat compressed, dry, surrounded by the mature calyx, easily separating into 2 mericarps; pericarp crustaceous.

The type of this species was collected by Anthelme Thozet and O'Shanesy in the vicinity of Rockhampton, Queensland, Australia. Mueller (1868) says of it: "A Lippia asperifolia jam differt forma foliorum, corollae tubo longiore, limbo ampliore, a L. dulci bracteolis, corollis fructibusque bis terve majoribus, fructu haud ovato."

This species is known to me only from the literature. The L. lantanifolia of Grisebach is L. grisebachiana Moldenke, and L. lantanifolia var. crenata Griseb. is L. junelliana (Moldenke) Troncoso.

LIPPIA LASIOCALYCINA Cham., Linnaea 7: 231--232. 1832.

Synonymy: Lantana melissifolia Clausen ex Moldenke, Alph. List Invalid Names Suppl. 1: 12, in syn. 1947.

Bibliography: Cham., Linnaea 7: 231--232. 1832; Steud., Nom. Bot., ed. 2, 2: 54. 1840; D. Dietr., Syn. Pl. 3: 599. 1843; Walp., Repert. Bot. Syst. 4: 52. 1845; Schau. in A. DC., Prodr. 11: 591. 1847; Schau. in Mart., Fl. Bras. 9: 247 & 307, pl. 39 left. 1851; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 95. 1894; Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1162. 1904; Briq. in Chod. & Hassler, Pl. Hassler. 2 (11): 497. 1904; Glaz., Bull. Soc. Bot. France 58, Mém. 3: 542. 1911; Stapf, Ind. Lond. 4: 125. 1930; Moldenke, Lilloa 5: 424. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 37, 40, 41, & 95. 1942; Moldenke, Alph. List Cit. 1: 12, 121, 164, 230, 264, & 289. 1946; Moldenke, Alph.

List Invalid Names Suppl. 1: 12. 1947; Moldenke, Lilloa 14: 43. 1948; Moldenke, Alph. List Cit. 2: 362, 364--366, 370, 534, & 553 (1948), 3: 670, 675, 676, 689, 846, 870, & 923 (1949), and 4: 1203, 1204, & 1296. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 80, 97, 99, & 190. 1949; F. C. Hoehne, Ind. Bibl. & Num. Pl. Col. Com. Rondon 348. 1951; Moldenke, Résumé 93, 114, 116, 306, & 461. 1959; Moldenke, Résumé Suppl. 3: 13. 1962; Moldenke, Biol. Abstr. 45: 5019. 1964; Moldenke, Phytologia 12: 24 & 174. 1965.

Illustrations: Schau. in Mart., Fl. Bras. 9: pl. 39 left. 1851.

Shrub, to 1.1 m. tall; branches strict, gray, angular, shiny; branchlets sulcate, rather scabridous-hirtellous, leafy above, with a few alternate leaves below, or leafless; buds mixed, naked, yellowish-lanuginous; leaves annual, deciduous, ternate or alternate, very short-petiolate; leaf-blades firm, ovate-elliptic, about 5 cm. long when mature and 1.4 cm. wide at the middle, acuminate at the apex, coarsely acute-serrate to the middle along the margins, impressed-penninerved above, shiny and very rough above, pale and pulverulent-glandulose beneath, scabrid on the venation; inflorescence verticillate-congested, contiguous above, showy, rarely borne with the mature leaves at the apex of this year's branchlets; racemes pedunculate, many-flowered, often solitary and axillary at the base of the new branchlets, at first rather compact with erect bractlets, later very loose and with elongate rachis and spreading or reflexed bractlets; peduncles pilose-scabrous; rachis pilose-scabrous; calyx very short-pedicellate, short, rather ampliate, bifid, the lobes 2-toothed, later 2-parted, very hirsute with wide-spreading straight distinct hairs; bractlets alternate, membranous, subequaling the corolla-tube; corolla hypocrateriform, red or rose to rose-lilac, thin-textured, pellucid, very sparsely pilose on the outside, glabrous inside, the tube about 8 mm. long, yellow inside, cream-colored outside, slightly incurved, somewhat ampliate above, not ventricose, the throat yellow, the limb about 6 mm. wide, venose, the outer part of the top purple, white near the throat, the upper and lateral lobes subequal, rounded at the apex, the lower lobe somewhat larger, truncate at the apex; fruiting-calyx closely appressed to the fruit; fruit typical of the genus, covered by the adhering calyx, oblong, truncate at the base, separating into 2 parts, but one seed tabescent; cotyledons fleshy; rostellum inferior, very small.

The type of this species was collected by Friedrich Sellow at São Antonio de Monte, Minas Gerais, Brazil, and was deposited in the herbarium of the Botanisches Museum at Berlin, where it was photographed by Macbride as his type photograph number 17522, but is now destroyed. The type of Lantana melissifolia was collected by Peter Clausen (no. 619), also in Minas Gerais, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm.

Schauer (1847) places L. lasiocalycina in his Section Zapania, Subsection Corymbosae. He says (1851): "Frutex inter congeneres foliis annuis, florescentia et frondescentia plerumque coaetanes,

inflorescentiae indole et ubertate maxime insignis". It has been collected on campos, flowering in April, July, and September to November, fruiting in October. The Eitens comment that it grows "in cerrado with scattered burned living trees to 10 m. tall, spaced 6--30 m. apart; ground cover mostly bunch grass". A wood sample of their no. 2230 is preserved in the United States National Museum in Washington. W. Hoehne 2717 represents a form with the stiff leaves present during anthesis and should be compared with L. phryxocalyx Briq. The F. C. Hoehne Com. Rondon 2839, distributed as L. lasiocalycina, is actually L. phryxocalyx.

Schauer (1851) cites the following specimens from Minas Gerais: Sellow s.n. [ad S. Antonio de Monte], Lund s.n. [in arenosis prope Aracoara, Majo], and Pohl s.n. [juxta flivium S. Francisci]; from Goías: G. Gardner 3405; and from Bolivia: Alcides d'Orbigny s.n. [prov. Chiquitos].

In all, 39 herbarium specimens and 5 mounted photographs, including type or phototype material of both names involved, have been examined by me.

Citations: BRAZIL: Bahia: A. Lutz 316, in part (Lz). Goías: G. Gardner 3405 (Br). Matto Grosso: Archer & Gehrt 69 (N, Sp--36446, W--1740782); F. C. Hoehne Com. Rondon 4049 (N); S. Moore 300 (C). Minas Gerais: P. Clausen 619 (N, N, S), s.n. [Aug.--April 1840] (Br); Glaziou 21915 (Br); N. Lund s.n. (Cp); Macedo 567 (N, S), 2034 (N, S, W--2196778); Regnell III.945 [5/10/1848] (N, S), III.945 [20/10/1848] (W--274926), III.945 [29/10/1848] (W--1322931); Sellow s.n. [S. Antonio de Monte; Macbride photos 17522] (It--photo of type, Kr--photo of type, N--photo of type, N--photo of type, W--photo of type). Paraná: Hatschbach 6378 (Z). São Paulo: Eiten & Eiten 2230 (W--2369842); G. Gehrt s.n. [Miguel Calmon, Sept. 22, 1919] (Sp--3622); W. Hoehne 2717 (Wh); Löfgren s.n. [Herb. Com. Geogr. & Geol. 911] (Sp--15654), s.n. [Herb. Com. Geogr. & Geol. 1414] (Sp--15648); N. Lund 2279 (Br); Pickel 3501 (Mm, Sf); Regnell III.945 [July 1848] (S), III.945a (S); J. E. Rombouts s.n. [Cosmorama, Sept. 25, 1938; Herb. Inst. Agron. S. Paulo 2706] (Sp, Sp--41091). BOLIVIA: Santa Cruz: D'Orbigny 971 (Br, Cb). PARAGUAY: Hassler 10630 (Cb, Cb).

LIPPIA LASIOCALYCINA var. SAINTHILAIREI Moldenke, Phytologia 9: 350. 1963.

Bibliography: Moldenke, Phytologia 9: 350. 1963; Moldenke, Résumé Suppl. 8: 2. 1964: Hocking, Excerpt. Bot. A.7: 455. 1964; Moldenke, Biol. Abstr. 45: 5019. 1964.

This variety differs from the typical form of the species in having its bractlets broadly ovate and merely acute or subacute at the apex.

The type of the variety was collected by August François Cesar Prouvençal de Saint-Hilaire -- in whose honor it is named -- at Olho d'Agua, Minas Gerais, Brazil, between 1816 and 1824.