

First published on the Flora Mesoamericana Website, 30 Sep. 2011.

50. MONIMIACEAE

By David H. Lorence.

Evergreen trees or shrubs, rarely lianas, often aromatic, monoecious or dioecious, rarely perfect (not on Meso), wood with broad rays. Leaves simple, usually opposite and decussate, rarely ternate or alternate (not in Mesoamerica), exstipulate, often gland dotted with ethereal oil cells, the trichomes simple, fasciculate or stellate (not in Mesoamerica), the venation pinnate, usually festooned brochidodromous, the margins entire or serrate. Inflorescences cymose or thyrsoidal, or the flowers fasciculate or solitary, either terminal, axillary, ramigerous or cauligerous, the bracteoles small and caduceus. Flowers small to large, actinomorphic, commonly unisexual, rarely bisexual or polygamous (not in Mesoamerica); receptacle usually well developed, variable in shape, calyptrate or not, sometimes splitting irregularly; tepals subequal, spiral, whorled or decussate, usually small and reduced, rarely petaloid. Staminate flowers with few to numerous basifixed stamens, cyclic or acyclic, the filaments usually short and flattened, sometimes with pair of basal appendages or staminodes (not in Mesoamerica), the anthers erect, 4-sporangiate, the loculi separate or confluent apically, lateral, longitudinally dehiscent; pollen grains mostly nonaperturate, rarely aperturate. Pistillate flowers with or without staminodes; carpels (1-) several to numerous, acyclic, rarely solitary, 1-locular, shortly stalked or sessile, free or enclosed or immersed in the receptacle wall (not in Mesoamerica), the style short or elongated, the stigma terminal, dry, the ovary solitary, erect, horizontal or pendulous. Fruiting carpels exposed, or enclosed or immersed in the accrescent receptacle wall (not in Mesoamerica), indehiscent, often drupaceous with a membranous or fleshy mesocarp or aril-like appendage; endocarp

membranous to bony; seed erect to pendulous, the endosperm abundant, oily and fleshy, the embryo straight, the cotyledons erect to divaricate. 22 gen., approx. 200 spp. Primarily the southern tropics.

This family of shrubs and small trees is chiefly southern tropical and consists of three subfamilies: Hortonioideae Thorne y Reveal., Mollinedioidae Thorne, and Monimioideae Raf. *Siparuna* was historically placed in the Monimiaceae but is now excluded and assigned to Siparunaceae.

1. Mollinedia Ruiz et Pav.

By David H. Lorence.

Dioecious shrubs or small trees, glabrous to pilose or strigillose, the hairs simple. Leaves opposite, petiolate, entire to dentate. Inflorescences terminal, axillary or on leafless nodes, in dichasia or thryses, rarely solitary. Flowers pedicellate, bracteolate; receptacle flat, campanulate, cupuliform, obconical, or urceolate; tepals 4, in equal or subequal pairs, 1(2) often larger and lacinate. Staminate flowers often yellow; receptacle internally glabrous, enclosing 8-55 stamens, the filaments short or absent, the anthers with the loculi free or apically confluent, longitudinally dehiscent. Pistillate flowers calyptrate, the apex with 4 small triangular tepals, the top part of the hypanthium circumscissile and dehiscent after anthesis, internally glabrous or pubescent; carpels 6-130. Fruiting receptacle a fleshy torus, glabrous or pubescent, bearing the free drupes; mature drupes sessile or stipitate, ovoid to ellipsoid, smooth or verrucose, glabrous or pubescent, the mesocarp thin, fleshy, the endocarp thin, horny. 20-90 spp. S. Mexico, Mesoamerica, tropical South America.

A genus of 20 (Renner y Hausner, 1997) to perhaps as many as 95 (Mabberley, 1987; Peixoto, 1987) species. The greatest diversity occurs in the Amazon Basin and the Andes.

Although 20 names have been published for *Mollinedia* species in Mexico and Central America, only eight species are recognized from the Mesoamerican region in this treatment. Certain species display considerable morphological variation that is not yet well understood (Gómez-Laurito, 2007; Lorence, 2001). For example, in species with broad altitudinal ranges such as *M. viridiflora* and *M. costaricensis*, populations from lower elevations generally have larger, thinner leaves than do those at higher elevations. Leaf size, shape, and dentation may vary considerably within species and often on a single individual. Leaves from basal branches or juveniles are larger and have more teeth than those from distal adult branches.

Taxonomically useful characters include density of pubescence, leaf length to width ratio and number of secondary veins, floral size, number of stamens, and mature carpel size and surface features. Nevertheless, a number of the species of *Mollinedia* from Mexico and Central America tend to intergrade or overlap in one or more characters including density of pubescence, leaf size and shape, number of flowers, number of stamens, shape and color of drupes, often making recognition of clearly defined taxonomic entities extremely difficult if not impossible. This extreme variability may be due to the recent phylogeographic history of the genus in Mesoamerica and subsequent radiation into newly available habitats in this region. In addition, drupes of *Mollinedia* are adapted for bird dispersal, and this may result in extensive gene flow enforced by obligate outcrossing and consequent hybridization between populations, thus resulting in a complex reticulate evolutionary pattern. In his treatment of Monimiaceae for the *Flora of Panama*, Duke (1962) noted the occurrence of numerous poorly differentiated entities that he termed "microspecies", which are taxonomically perplexing. In any case, in order to produce a reasonably practical and useful treatment, it was decided to reduce a number of names

to synonymy and adopt broad species concepts for some taxa, recognizing only eight species in Mesoamerica. The broad species concept adopted for *M. viridiflora* is not particularly satisfactory, but infraspecific subdivision is not feasible because of character intergradation. Clearly additional research, including field work and molecular studies, is required to produce a clearer understanding of species delimitations and phylogenetic lines in this taxonomically complex genus.

1. Leaf blades (23-)28-42 × (14-)21-28.5 cm; staminate flowers with c. 150 stamens.

5. *M. maxima*

1. Leaf blades 5-23 × 1-15.5 cm; staminate flowers with 8-37(-45) stamens.

2. Stems, petioles, and inflorescences with the surfaces obscured by a dense, persistent indument of trichomes, at least when young (some individuals of *M. butleriana* and *M. lanceolata* glabrate or glabrescent).

3. Leaf blades broadly elliptic, broadly ovate-elliptic, or suborbicular, or sometimes obovate-elliptic, l:w 1.25:1-2:1.

2. *M. butleriana*

3. Leaf blades lanceolate, oblong-ovate, ovate, elliptic, or obovate-elliptic, l:w 1:2 2:1 to 4:1.

4. Leaf blades widest at or above the middle.

3. *M. costaricensis*

4. Leaf blades widest below the middle.

4. *M. lanceolata*

2. Stems, petioles, and inflorescences glabrous to strigillose, the surfaces not obscured by an indument of trichomes even when young.

5. Leaf blade l:w ratio 3.6:1 to 7:1, with 8-14 pairs of secondary veins.

6. Bark of older twigs and branches smooth, lenticellate or fissured, not corky.

1. *M. angustata*

6. Bark of older twigs and branches with corky ridges or patches.

7. *M. pallida*

5. Leaf blade l:w ratio 1.75:1 to 4:1, with 4-6(-8) pairs of secondary veins.

7. Staminate flowers 2-3(-5) × 2-4(-5) mm; stamens 10-15; pistillate flowers 4-5 × 3-4 mm, including calyptra; mature fruiting carpels 8-11 × 7-8 mm, broadly ovoid-ellipsoid to subglobose.

6. M.

minutiflora

7. Staminate flowers 4-6 × 4-7 mm; stamens 20-25; pistillate flowers 5-10 × 2.5-6 mm including calyptra; mature fruiting carpels 13-15 × 9-10 mm, ovoid-ellipsoid.

8. M. viridiflora

1. Mollinedia angustata Lundell, *Wrightia* 5: 29 (1974). Isotype: Guatemala, *Contreras 10889* (F!). Ilustr.: no se encontró.

Trees to 9 m; young stems and leaves minutely and sparsely strigillose, glabrescent; leafy twigs 1.5-2 mm in diam. Leaves 8-14 × 1.3-2.8 cm, l:w 4:1 to 7:1, narrowly lanceolate to narrowly elliptic or linear-elliptic, chartaceous to subcoriaceous, glabrous except the costa sparsely strigillose abaxially, the secondary veins 8-14 pairs, brochidodromous, adaxially obscure, the venation prominulous abaxially and visible to 3°, the base narrowly cuneate, the margins subentire or with 1-5 pairs of teeth in the distal half, slightly revolute or plane, the apex acuminate, slightly falcate; petioles 4-9 × 0.8-1 mm. Staminate inflorescences 1.5-3 × 1.5-2 cm, of 1-3 dichasia, sparsely strigillose; bracteoles to 1 mm, narrowly triangular to ovate-elliptic; peduncles 5-13 mm; pedicels 4-12 mm, slender. Staminate flowers c. 3 × 2-2.5 mm in bud, 4-5 mm wide at anthesis; tepals 1-2 × 1-2 mm, triangular-ovoid; stamens 10-26, 0.6-0.8 × 0.8-1 mm, the loculi confluent apically. Pistillate flowers solitary on leafless nodes, strigillose; pedicel plus peduncles 25-30 mm, minutely bracteolate medially; receptacle 4-5.5 × c. 3 mm, narrowly ovoid; tepals c. 1 mm, narrowly triangular; carpels 10-12. Infructescences with the pedicel plus

peduncle 10-23 mm; torus pubescent; fruiting carpels 12-18 × 8-11 mm, shortly stipitate, broadly ovoid to ovoid-ellipsoid, rugulose, glabrate or sparsely strigillose basally. *Selvas altas perennifolias*. G (Lundell y Contreras 20429, MO). 1500-2300 m. (Mexico [Veracruz], Mesoamerica.)

Mollinedia angustata is to be expected in Chiapas. It is distinguishable by its narrow leaves with a length:width ratio of 4:1 to 6:1. It resembles *M. torresiorum* Lorence from Oaxaca, Mexico, which differs in having completely glabrous stems and leaves, longer inflorescence bracteoles 5-6 mm, staminate flowers with 16-19 stamens, fruiting receptacle with a glabrous torus, and smooth carpels (Lorence, 1999).

2. *Mollinedia butleriana* Standl., *Publ. Field Mus. Nat. Hist., Bot. Ser.* 4: 306 (1929).

Holotype: Honduras, *Standley 56770* (F!). Ilustr.: no se encontró.

Shrubs or small trees to 6 m; young stems and leaves densely brown velutinous-hirtellous with spreading hairs. Leaves petiolate; blades (10-)15-20 × (5.5-)6.5-15.5 cm, l:w 1.25:1 to 2:1, broadly elliptic, broadly ovate-elliptic, or suborbicular, chartaceous to subcoriaceous, drying brown, adaxially sparsely hirtellous on the veins and costa, abaxially hirtellous on the surface and densely so along the veins and costa, the hairs to 0.5 mm, spreading, the secondary veins 5-6 pairs, brochidodromous, the venation prominulous to 5° abaxially, the base broadly cuneate to obtuse or rounded, the margins usually with 5-15 pairs of small teeth in the distal 2/3 or subentire, the apex obtuse to rounded or with an abruptly short acuminate tip to 5 mm; petioles 10-20 × 1.5-2.5 mm, hirtellous, velutinous-tomenose. Inflorescences axillary, on leafless nodes or sometimes terminal, dichasial, densely brown hirtellous-velutinous. Staminate inflorescences 2-3 cm, of 1-3 dichasia; peduncles 4-20 mm; bracts 1.5-2.5 mm, ovate; pedicels 1.5-7 mm. Staminate flowers c. 3 × 3-4 mm in bud, obconical,

4-5 × 4-5 mm at anthesis; tepals c. 2 × 4 mm, obtuse; stamens 30-35, 1-1.5 mm. Pistillate inflorescence 1-3-flowered; peduncles 2-10 mm; pedicels 1-3 mm; receptacle 4-5 × 5-6 mm, ovoid-urceolate; tepals 4, triangular; carpels 15-20. Fruiting peduncles plus pedicel 8-25 mm; torus hirtellous; carpels 15-16 × c. 12 mm, sessile or shortly stipitate, broadly ovoid-ellipsoid or subglobose, the surface rugulose, pilosulose-strigulose, ripening purple-black. *Selvas altas perennifolias, bosques mesofilos de montaña con Quercus y Liquidambar*. H (MacDougal et al. 3406, MO). 500-1200 m. (Mexico [Oaxaca, Veracruz], Mesoamerica.)

Mollinedia butleriana is characterized by its usually dense brown pubescence of spreading hairs on the stems, leaves, and inflorescences and comparatively large leaves. Its spreading brownish pubescence resembles that of *M. costaricensis*, which differs by its narrower leaves with l:w ratio of 2:1 to 3:1 and longer pedicels and peduncles. However, some collections of *M. butleriana* from Honduras (e.g. Liesner 26695, MO) approach *M. costaricensis* in having relatively sparser pubescence and longer pedicels.

3. *Mollinedia costaricensis* Donn. Sm., *Bot. Gaz.* 33: 257 (1902). Syntype: Costa Rica, *Donnell Smith 6760* (US!). Ilustr.: no se encontró.

Shrubs or small trees 2-10 m, occasionally sprawling; young stems and leaves densely villous-tomentose, the hairs 0.2-0.5 mm, persistent, brown, spreading or antrorsely curved; leafy twigs often compressed. Leaves petiolate; blades (6-)7-16 × (2-)3.5-7 cm, l:w 1.2:1-4:1, broadly elliptic to elliptic, oblong-elliptic or obovate-elliptic, chartaceous, adaxially sparsely strigillose, denser along the costa and veins, or glabrescent to glabrate, abaxially moderately to densely strigillose-tomentose, the secondary veins 6-7 pairs, brochidodromous, the base cuneate to rounded, sometimes attenuate, the margins subentire or with 3-10 pairs of slender teeth in the distal half, the apex, usually obtuse or sometimes rounded, the tip 0.5-1.5 cm, often abruptly

short acuminate; petioles 7-14 × 1-2 mm, strigillose-tomentose. Inflorescences axillary or on leafless nodes, dichasial, moderately to densely strigillose-tomentose. Staminate inflorescences 1.5-5 × 2-4 cm, of (1-) 2-4 dichasia or pleiochasia; peduncles 10-35 mm; pedicels 3-6 mm bracteolate. Staminate flowers 3-5 × 4-5 mm in bud, subglobose, 5-7 mm wide at anthesis; tepals acute to rounded; stamens (16-)32-37(-45), 0.8-1.2 × 0.4-1 mm, the loculi confluent apically. Pistillate inflorescences 1-3-flowered; peduncle plus pedicel 12-35 mm. Pistillate flowers 5-7 × 5-10 mm, subglobose to broadly ovoid; tepals 1-3 mm, triangular; carpels 20-35, densely sericeous. Fruiting pedicel plus peduncle 1.5-5 cm; torus tomentose; fruiting carpels 11-14 × 9-10 mm, broadly ovoid to ellipsoid, strigillose, rugulose. *Selvas altas perennifolias, bosques mesófilos de montanas*. H (Liesner 26087, MO); CR (Grayum et al. 5836, MO); P (Sytsma 3779, MO). 0-1900 m. (Endemic.)

4. *Mollinedia lanceolata* Ruiz et Pav., *Syst. Veg. Fl. Peruv. Chil.* 143 (1798). Holotype: Peru, Ruiz y Pavón s.n. (MA). Ilustr.: Renner y Hausner, *Fl. Ecuador* 59: 105, t. 36 (1997).

Shrubs or small trees to 4 m; stems brownish velutinous-tomentose, strigillose, or less commonly glabrate when young, glabrescent with age. Leaves petiolate; blades 15-24 × 5.5-8.5 cm, l:w 3:1 to 4:1, oblong-ovate or lanceolate, stiffly chartaceous, adaxially sparsely strigillose or glabrescent, abaxially strigillose, the hairs denser along the costa and veins, the secondary veins 7-10 pairs, conspicuously curved, brochidromous, prominulous adaxially, the venation prominulous to 4° abaxially, the base cuneate or obtuse to rounded, the margins usually with 7-9 pairs of small teeth in the distal half, the apex acuminate, sometimes caudate, the tip to 25 mm; petioles 7-11 × 2 mm, velutinous-tomentose to glabrate. Inflorescences often terminal, or axillary or on leafless nodes, dichasial or pleiochasia, brownish velutinous-tomentose or strigillose. Staminate inflorescences 4-13 × 2-4 cm, dichasial or pleiochasia, 6-15-flowered;

pedicels 3-10 mm. Staminate flowers 3-4 × 4-5 mm, obconical or campanulate, loosely appressed strigose; tepals 2-2.5 × 2.5-3 mm, triangular-ovate; stamens 18-30, 0.8-1 mm. Pistillate inflorescences dichasial or pleichasial, 3-6-flowered or the flowers solitary; pedicel plus peduncle 12-18 mm, bracteolate; receptacle 4-5 × 5-6 mm, broadly ovoid, appressed strigillose; tepals 4, c. 1 mm, triangular, carpels c. 25. Fruiting peduncle plus pedicel 12-35 mm; torus pubescent; carpels 12-14 × 9-10 mm, sessile, ovoid-ellipsoid, smooth to wrinkled. *Lower montane and montane wet forests*. P (*Gentry y Mori 13961*, MO). 1000-1900 m. (Mesoamerica, Colombia, Ecuador, Peru, Bolivia.)

Several collections which apparently represent this species are known from the Darién and Chiriquí provinces of Panamá.

5. *Mollinedia maxima* J.F. Morales et M. Grayum, *Darwiniana* 47: 229 (2009). Isotype: Costa Rica, *Morales et al. 1500* (MO!). Ilustr.: Morales y Jiménez, *Novon* 6: 396, t. 1 (1996).

Mollinedia macrophylla J.F. Morales et Q. Jiménez non (A.Cunn.) Tul.

Shrubs or small trees to 2 m; twigs 6-12 mm diam., densely hirtellous. Leaves petiolate; blades (23-)28-42 × (14-)21-28.5 cm, broadly ovate to broadly ovate-elliptic, subcoriaceous, adaxially glabrate, abaxially densely hirtellous on the costa and veins, the surface hirtellous, the secondary venation raised and prominent to 6° on both surfaces, the base obtuse, rounded or subcordate, the margins with 15-20 pairs of small teeth in the distal 2/3, the apex obtuse or acute and shortly acuminate with a tip to 1 cm; petioles 13-30 × 4-5 mm, densely hirtellous. Inflorescences axillary or on leafless nodes, dichasial or pleiochasial, hirtellous-velutinous, bracteolate. Staminate inflorescences 4-7 × c. 5 cm, in (1-)2-4 cymes, 3-12-flowered; peduncles 2-3.5 cm; bracteoles 2-3 mm; pedicels 3-8 mm, slender. Staminate flowers 7-9 × 5-8 mm in bud, ovoid-ellipsoid, c. 10 mm at anthesis, strigillose; tepals obtuse; stamens c. 150, 1-2 mm,

subsessile, the loculi confluent apically. Pistillate inflorescences 2-5-flowered; carpels 31-40. Fruiting pedicel plus peduncle c. 1.7 cm; torus hirtellous; mature drupes 14-17 × 7-8 mm, sessile or subsessile, ovoid-ellipsoid, the surface smooth or slightly wrinkled, sparsely strigillose or glabrate, ripening black. *Bosques muy húmedos, pluviales y nubosos*. CR (Vargas 416, MO). 400-1600 m. (Mesoamerica, Colombia, Ecuador.)

Reported from Panama by Renner & Hauser (1997), but no specimens cited.

A new name was proposed (Morales y Grayum, 2009) for this species, as the specific epithet was already occupied in *Mollinedia* by *M. macrophylla* (A. Cunn.) Tul., *Ann. Sci. Nat., Bot. sér.* 4, 3: 45 (1855). Basionym: *Hedycarya macrophylla* A. Cunn., *Ann. Nat. Hist.* 1: 215 (1838) (Morales y Jiménez, 1996).

6. *Mollinedia minutiflora* Standl. et L.O. Williams, *Ceiba* 1: 237 (1951). Holotype: Costa Rica, *Norby y Norby 317* (US!). Ilustr.: no se encontró.

Trees or shrubs 3-10 m, occasionally sprawling; new growth sparsely strigillose, glabrescent. Leaves petiolate; blades 6-17 × 1.7-5.7 cm, elliptic to narrowly elliptic or ovate-elliptic, the base acutely to obtusely cuneate or rounded, the margins entire or with 1-7 pairs of small teeth, the apex acuminate; petioles 5-12 × 1-1.5 mm. Inflorescences axillary, on leafless nodes or terminal, dichasial or pleiochasial, strigillose, bracteolate. Staminate cymes 1.5-3.5 cm, 9-15-flowered, solitary or in fascicles of 2-3; pedicels 2-10 mm, slender; receptacle 2-3 × 2-4 mm, obconical, cupuliform; tepals obtuse; stamens 8-18, 0.8-1 mm, the filaments short or nil; the loculi apically confluent. Pistillate inflorescences 1-5-flowered; pedicel plus peduncle 10-15 mm, slender, 2-bracteolate medially; receptacle 4-5 × 3-4 mm, ovoid-urceolate; tepals 4, triangular, erect-spreading at anthesis; carpels 10-20. Fruiting peduncle plus pedicel 10-25 mm; torus puberulent; mature drupes 8-11 × 7-8 mm, sessile or subsessile, broadly ovoid-ellipsoid or

subglobose, ripening purple-brown or purple-black, glabrous, rugulose. *Lowland evergreen rain forests and montane forests*. N (Rueda et al. 5439, MO); CR (Hammel y Nepokroeff 15057, MO); P (Hamilton y Stockwell 3558, MO). 10-800 m. (Endemic.)

Mollinedia minutiflora is closely related to and perhaps only modally distinct from *M. viridiflora*, which differs in having larger staminate flowers with more numerous stamens, somewhat larger pistillate flowers with longer pedicels, and slightly larger drupes. Although differences between these two taxa often overlap or intergrade, specimens can generally be separated by the characters given in the key, and they are tentatively maintained as distinct species in this treatment.

7. *Mollinedia pallida* Lundell, *Wrightia* 5: 30 (1974). Isotype: Mexico, Chiapas, *Matuda 2094* (MEXU!). Ilustr.: no se encontró.

Mollinedia flavida Lundell, *M. pauciflora* Lundell.

Shrubs or small trees to 20 m, sometimes scrambling; young stems and leaves glabrous or sparsely strigillose when young and soon glabrate; bark of older twigs and branches developing distinctive corky ridges or patches. Leaves petiolate; blades 7.5-17 × 1.2- 4.5 cm, l:w 3.7:1 to 6.3:1, narrowly elliptic, oblong- or linear-elliptic, or rarely oblanceolate, thinly to stiffly chartaceous, both surfaces glabrous, the secondary veins 8-13 pairs, brochidodromous, the veins prominulous adaxially, the venation prominulous to 3° abaxially, the base narrowly cuneate to cuneate, the margins usually with 5-15 pairs of small teeth in the distal 2/3 or subentire, the apex narrowly acute to acuminate with a tip to 10-15 mm; petioles 5-8 × 1-1.2 mm, glabrous. Inflorescences often terminal, or axillary or on leafless nodes, dichasial or often pleiochasial, sparsely strigillose or glabrate. Staminate inflorescences 2-3.5 × 3-4 cm, of 1-6 dichasia; peduncles 15-20 mm; bracts 0.5-1.5 mm, narrowly triangular; pedicels 2-8 mm. Staminate

flowers 3-5 × 4-5 mm in bud, obconical, 6-8 × 6-8 mm at anthesis; tepals 2-3 × 3-4 mm, triangular-obtuse; stamens 25-40, 1-2 × 1-2 mm, sessile, the loculi confluent apically. Pistillate inflorescences not seen. Fruiting peduncle plus pedicel 10-25 mm; torus strigulose; carpels 14-20 × 8-11 mm, sessile, ovoid-ellipsoid, beaked or not, smooth or often longitudinally wrinkled, ripening purple-black. *Montane wet forests and rain forests. Ch (Breedlove y Bartholomew 55778, MO); G (Steyrmark 37177, MO). 1200-2100 m. (Endemic.)*

Mollinedia pallida resembles higher elevation forms of *M. viridiflora* in leaf morphology, but in *M. pallida* the corky ridges on the older stems are distinctive, the leaves are virtually glabrous and relatively narrower with l:w 3.7:1 to 6.3:1, and the staminate inflorescences are frequently terminal.

8. *Mollinedia viridiflora* Tul., *Ann. Sci. Nat., Bot. sér.* 4, 3: 43 (1855). Holotype: Mexico, Oaxaca, *Galeotti 7172* (P!). *Illustr.: Duke, Ann. Missouri Bot. Gard.* 49: 238, t. 174 (1962), as *M. stipitata*.

Mollinedia darienensis Standl., *M. guatemalensis* Perkins, *M. mexicana* Perkins, *M. nigrescens* Tul., *M. orizabae* Perkins, *M. pinchotiana* Perkins, *M. ruae* L.O. Williams et Ant. Molina, *M. stipitata* J.A. Duke.

Shrubs or small trees 2-12(-18) m; stems sparsely to moderately strigillose or glabrate. Leaves 6-15(-23) × 2-9 cm, l:w 1.5:1 to 4.5:1, narrowly to broadly elliptic, ovate-elliptic or obovate-elliptic, chartaceous to subcoriaceous, adaxially glabrous, abaxially sparsely to moderately strigillose, the secondary veins 7-8 pairs, the venation visible to 3° adaxially, prominulous and visible to 4° or 5° abaxially, the base cuneate to obtuse or rounded, the margins entire or serrulate with 1-9(-12) pairs of small teeth in the distal 1/2-2/3, the apex acuminate or less often acute; petioles (2-)6-15 × 1-2 mm, strigillose or glabrate. Inflorescences axillary, on

leafless nodes or less often terminal, in groups of 1-several cymes. Staminate inflorescences 2.5-5 cm, dichasial or pleiochasial, usually with (1-)3-9(-12) flowers, strigillose; peduncles or rachis 10-30 mm; pedicels 3-17 mm; receptacle 4-6 × 4-7 mm, obconic or campanulate; stamens 20-25, 0.5-1.5 mm, the locules confluent apically, the filaments short or nil. Pistillate inflorescence with 1-5 flowers; pedicel plus peduncle 15-30 mm; receptacle 5-10 × 2.5-6 mm, urceolate or ovoid; tepals 4, c. 2 × 2 mm, triangular, erect-spreading; carpels 15-22. Fruiting pedicel plus peduncle 5-30 mm; torus puberulent or glabrate; fruiting carpels 13-15 × 9-10 mm, sessile or shortly stipitate, ovoid-ellipsoid, glabrous or glabrate, smooth or rugulose. *Lowland and montane evergreen wet and rain forests (Selvas altas perennifolias), and cloud forests (bosques mesofilos de montañas)*. Ch (*Breedlove y Almeda 60285*, MO); B (*Whitefoord 1216*, MO); G (*Contreras 6779*, P); H (*Davidse et al. 35341*, MO); N (*Grijalva 417*, MO); CR (*Grayum y Hammel 5682*, MO); P (*Churchill y de Nevers 4369*, MO). 100-2700 m. (Mexico [Guerrero, Oaxaca, Veracruz], Mesoamerica.)

Reported from El Salvador by Linares (2003 [2005]), but no specimens cited.

Mollinedia viridiflora is widespread from southern Mexico through Mesoamerica and exceedingly diverse ecologically, ranging from near sea level to 2,700 m in various moist, wet, and cloud forest habitats. It is also extremely variable in vegetative morphology (pubescence, size, shape, and texture of the leaves), and to a lesser extent in floral morphology (floral pubescence, number of stamens and carpels). Forms with shortly stalked or “stipitate” carpels have been described as *M. darienensis* and *M. stipitata*; however, this is not a constant feature and may be an artifact of specimen drying. Forms with relatively larger and broader leaves (l:w ratio 1:5:1 to 3:1) generally occur in lower elevations in southern Mexico and northern Central America (Guatemala to Honduras), and these have been described as *M. guatemalensis* and *M. pinchotiana*. Other forms with narrower, smaller leaves (l:w ratio 3:1 to 4:1) generally occur at

higher elevations in southern Mexico to Central America, and these have been described under the names *M. darienensis*, *M. mexicana*, *M. nigrescens*, *M. orizabae*, and *M. ruae*. Although these forms seem distinct, especially in southern Mexico, morphological characters often vary continuously and seemingly independently, especially in middle to southern Mesoamerica thus rendering it impractical, if not impossible, to divide *M. viridiflora* into infraspecies.

Literature

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