

THE GENUS MELOCHIA L. (STERCULIACEAE)

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History of the Genus

Linnaeus validated the name *Melochia* by including it in the first edition of his *Species Plantarum* (37). In his *Genera Plantarum* (38) of the following year under the description of *Melochia* he cited only Dillenius (9), who had described and illustrated only *Melochia corchorifolia* in the genus *Melochia*. According to the current International Code of Botanical Nomenclature (33), it is agreed to associate generic names which appear in Linnaeus' *Species Plantarum*, edition 1, 1753, with the first subsequent description given under those names in Linnaeus' *Genera Plantarum*, edition 5, 1754. Therefore, *Melochia corchorifolia* L. is considered to be the type species of the genus.

Melochia is a name altered from the Arabic name of *Corchorus olitorius* L., a salad plant in the East, and according to Gray (20) the name was borrowed by the Arabs, through the Syriac, from the Greek word for the mallow.

Several genera have been published and subsequently reduced to synonymy under *Melochia*. In 1777 Houttuyn (27) introduced the name *Visenia* for his *V. umbellata*, a common tree of southeastern Asia and the Pacific Islands. In 1854 Gray (19) expressed the opinion that *Visenia* could not be generically distinguished from *Melochia*. In 1895 Schumann (48) gave it its present status as a section of *Melochia*.

In 1787 Medicus (42) introduced the name *Moluchia* for species with pyramidal fruits—placed in the section *Pyramis* in this paper. In 1803 Ventenat (64) introduced the name *Riedlea*, characterized by a 5-valved globular capsule, filaments united in a column, and a calyx subtended by 3 bracts. *Riedlea* is placed in the section *Melochia* in this paper. In 1823 Humboldt, Bonpland, and Kunth (28) introduced *Mougeotia* for species with a pentacoccic capsule. DeCandolle (8) reserved the name *Melochia* for species placed in the section *Pyramis* in this paper, and used the name *Riedleia* for *Riedlea* Vent., *Mougeotia* H. B. K., and *Visenia* Houtt. He also established the tribe *Hermannieae*, which includes *Hermannia* L., *Melochia* L., and *Waltheria* L. Two years later Sprengel (51) used *Melochia* as did DeCandolle, but substituted *Visenia* for *Riedleia*, probably on the basis of priority.

In 1825 St.-Hilaire (46) reported on his rather extensive collections of *Melochia* in southern Brazil, and gave reasons for not considering *Riedlea* Vent. generically distinct from *Melochia*. He mentioned that the flowers are very similar and that, as a rule, other characters being the same, Linnaeus would not divide a genus if the flowers were the same but the fruits different. He did not consider the presence of bracts subtending the calyx a generic character and pointed out that there are intermediate forms in the types of dehiscence of the fruit in *Melochia* and *Riedlea*.

In 1836 Presl (45) introduced *Physodium*, and mentioned that it differed from *Riedleia* in having an inflated, closed calyx, linear anthers, and an acute-angled, stipitate capsule. Bentham and Hooker (3) maintained *Melochia* and *Physodium*, but, considering St.-Hilaire's observations and their own, they placed *Riedlea* in synonymy. Hemsley (25) did not consider *Physodium* to be generically distinct from *Melochia* but followed Bentham and Hooker in maintaining it.

In 1854 Triana and Karsten in Triana (58) introduced *Anamorpha*, and in 1858 Turczaninow (60) introduced *Physocodon*. Both have since been reduced to *Melochia*. They contain species now placed in the section *Mougeotia*.

In 1864 Grisebach (22) divided the genus into the sections *Eumelochia*, *Riedleia*, and *Mougeotia*. As emended in description, and as changed in nomenclature, in accord with the International Code of Botanical Nomenclature, these sections are maintained in the present paper.

Schumann (47), in the next major treatment of the genus, considered all of the genera mentioned above, occurring in Brazil, to be synonyms of *Melochia*, and he accepted Grisebach's sectional division of the genus.

In 1890 Garcke (17) discussed part of the extensive synonymy in the genus.

In 1895 Schumann (48), in treating *Melochia*, added *Visenia* as a section containing certain species of Asia and the Pacific Islands, and reduced *Physodium* to synonymy.

In 1908 Fries (15) presented his concepts of the taxa in *Melochia* in South America. He examined and cited specimens from several European herbaria.

From time to time species and infraspecific taxa have been described in the genus *Melochia* and its synonyms. These are considered in the systematic section of this paper. Approximately 379 names and combinations have been used to describe the types of *Melochia*. Many are synonyms and many of the descriptions are very inadequate. I have made more than 30,000 observations of characters in the genus. About half of them were measurements under the dissecting micro-

scope. Thus, I have supplemented the information in the old descriptions. As a result of my studies, I consider 68 taxa to be adequate to describe the entities in the genus. Two new species are described and *Physodium* is placed in sectional status.

Division of the genus into several genera has been based on characters which show a gradual transition between species from section to section as follows: (1) The carpels of some species of the section *Mougeotia* have an obtusely rounded dorsal surface; in others the carpels are somewhat carinate in the distal half of the fruit and transitional to the section *Pyramis*. (2) In the size of the fruit from the section *Mougeotia* to the section *Pyramis*. (3) One type of dehiscence to another occurs between species. (4) The gradual change in degree of accrescence of the calyx, degree of union of the filaments, and length of the stipe. (5) In the size of bracts in all species and in the length of the internode between each of them and between them and the calyx.

In addition to the taxonomic treatments already mentioned, several floras and lists have been published in which pertinent *Melochia* are presented. Included among the regions treated are Mexico (52), several countries of Central America (25, 53, 54, 55, 56), several of the islands of the West Indies (4, 13, 22, 36, 62), Surinam (61), French Guiana (35), Venezuela (44), Colombia (59), Peru (39), Bolivia (14), tropical West Africa (29), Congo (18), Angola (11), the basin of the Zambesi River (12), Madagascar (1), India (26), Indochina (16, 57), Java (2), the Philippine Islands (43), and Fiji (49). Since the taxa attributed to the various regions by the authors of these floras and by me differ in some cases, I am including tables showing the distribution of the species of *Melochia* by countries (pp. 196 and 197).

Economic Importance

The genus *Melochia* has no outstanding economic importance. Some species, such as *M. pyramidata*, have fine silky fibers, but at present these are used only locally. Some species occur in pasture lands, especially savannas. Gentry mentioned (his specimen no. 943M [MICH]) that burros are very fond of the plant (*M. tomentella*). A few species are weeds in cultivated fields. The plants have a mucilaginous constituent that is used locally as a demulcent in enteritis due to dysentery. They are also used locally as a salad plant, and for smoking. The flowers are a source of food for honeybees.

Melochia umbellata (Houtt.) Stapf, a rapidly growing species of southern Asia and the Pacific Islands, is commonly planted as a shade tree in that part of the world.

Geographic Distribution

In America, *Melochia* is distributed over more than 5.6 million square miles. It ranges from approximately 33° N. to 33° S. latitude on the east coast, and from approximately 29° N. to 12° S. latitude on the west coast. The distribution of the genus in South and North America is shown in figures 1 and 2, respectively. The coordinates

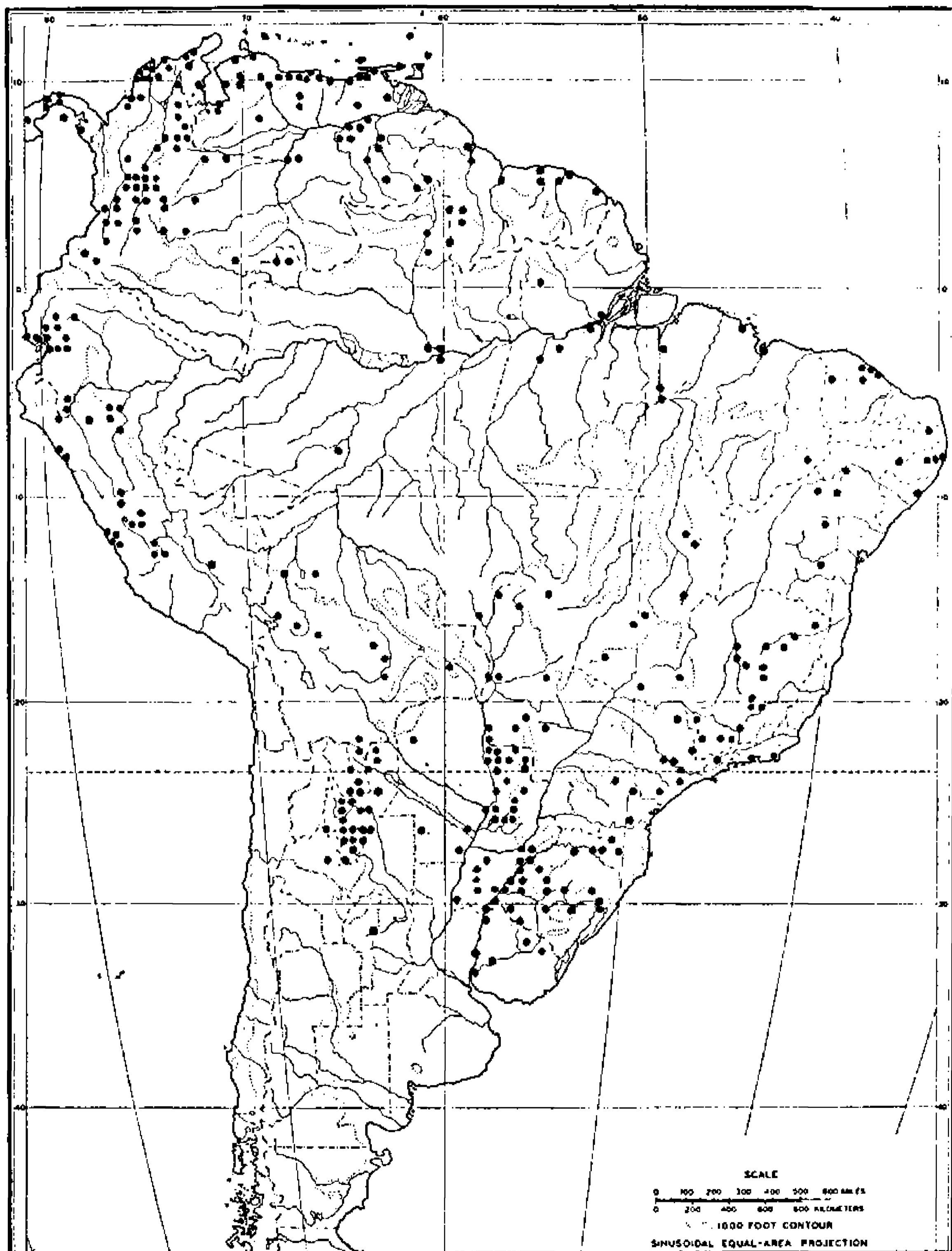


FIGURE 1.—Distribution of *Melochia* in South America.

of many of the localities of the specimens studied were determined from the "Index to the Map of Hispanic America" (31).

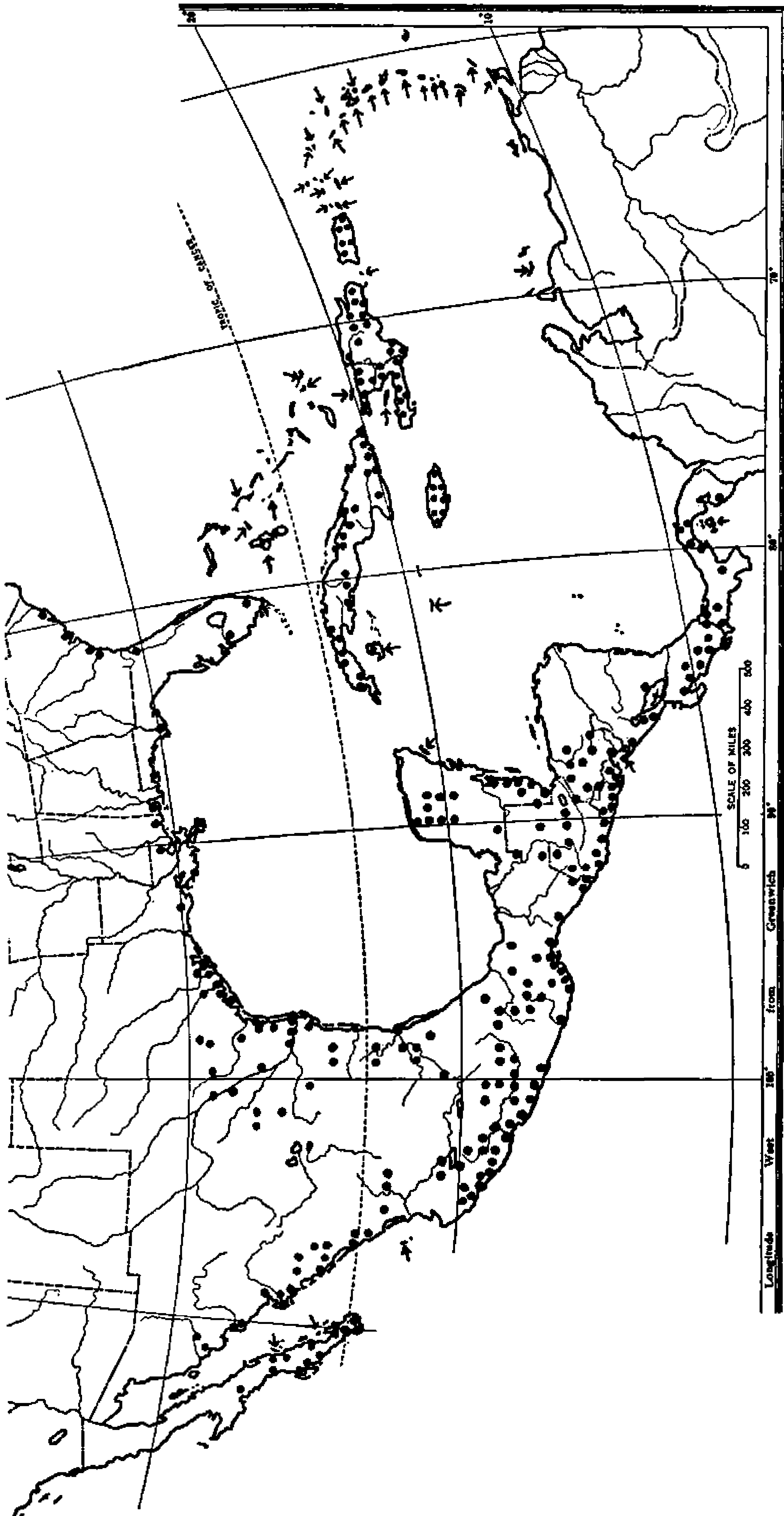


FIGURE 2.—Distribution of *Melochia* in North America.

TABLE 1.—*Distribution of American Species of Melochia by Countries*

MELOCHIA	United States	Mexico	Guatemala	British Honduras	Honduras	Salvador	Nicaragua	Costa Rica	Panama	Bahamas	Cuba	Hispaniola	Jamaica	Puerto Rico	Lesser Antilles	Trinidad-Tobago	French Guiana	Surinam	British Guiana	Venezuela	Colombia	Ecuador	Peru	Bolivia	North Brazil	South Brazil	Uruguay	Paraguay	Argentina	
adenodes		X																												
anomala																														X
arenosa											X									X	X	X								
argentina																								X					X	
bernoulliana		X	X			X																								
betonicifolia																									X	X				
caracasana																					X	X			X	X				
chamaedrys																								X		X	X		X	
colombiana																														
corchorifolia *	X								X																	X				
corymbosa		X																												
crenata													X																	
gardueri																									X	X				
graminifolia																				X	X	X		X	X	X		X	X	
hassleriana																									X	X		X	X	
hermannioides																								X	X	X		X	X	
illicoides																									X	X				
kerriifolia		X																			X	X		X	X	X				
lanata																									X	X				
lanceolata																			X	X										
leucantha																								X	X					
lupulina		X	X	X	X			X	X				X								X	X	X	X	X					
manducata		X	X	X				X	X		X	X									X	X	X	X	X					
melissifolia				X				X	X								X	X			X	X		X	X	X				
mollis																					X	X	X	X						
morongii																								X	X	X		X	X	
nodiflora		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X	X	X	X	X	X				
nudiflora		X	X		X			X													X	X	X	X	X	X				
parvifolia											X								X	X	X	X	X	X	X	X		X	X	
pilosa		X	X		X								X	X						X	X	X	X	X	X	X	X	X	X	
pyramidata	X	X	X	X	X	X	X	X		X	X	X	X	X	X					X	X	X	X	X	X	X	X	X	X	
rhodocalyx		X																												
savannarum											X																			
simplex																			X					X	X	X		X	X	
splendens																					X	X		X	X	X				
thymifolia																								X	X					
tomentella		X																												
tomentosa	X	X			X		X			X	X	X	X	X	X	X	X			X	X	X		X	X					
tragiifolia		X																												
ulmifolia																		X	X	X	X	X	X	X	X	X				
villosa	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
werdermannii																									X	X		X	X	

*Adventive.

The genus occurs in more than 6.7 million square miles of the Old World, from 37° N. in eastern Asia to 24° S. in the Pacific Islands, and from 18° N. to 16° S. in western Africa and 2° S. to 20° S. in eastern Africa. The distribution of the genus in Asia, the East Indies, and Africa is shown in figures 3, 4, and 5, respectively. The

TABLE 2.—*Distribution of Extra-American Species of Melochia*

MELOCHIA	Africa	Madagascar	Asia	East Indies, Philippines	New Guinea	Australia	Solomon Islands to New Caledonia	Fiji Islands	Samoa, Tonga & East Pacific	Caroline & Marianas
aristata									×	
bracteosa	×	×								
compacta										×
corchorifolia	×	×	×	×	×	×				×
degeneriana								×		
grayana								×		
lanceolata		×						×		
longepetiolata								×		
melissifolia	×							×		
mollipila								×		
odorata					×		×			
pyramidata *		×		×	×	×				
roseiflora								×		
tomentosa *		×								
umbellata			×	×	×					
villosissima										×
vitiensis								×		

* Adventive.

coordinates of many of the localities were determined from the Columbia Lippincott Gazetteer of the World (5).

Distribution of the various taxa is given in greater detail at the end of the respective descriptions. Distribution of species of *Melochia* by countries is also given in tables 1 and 2.

Thirty-nine species are considered to be endemic to America, one to southern Asia and the southwest Pacific islands, ten to the southwest Pacific islands, one to Africa, two to Africa and South America, and one to Asia, Africa, and the southwest Pacific islands.

Two American species occur as weeds in the Eastern Hemisphere and one species has been transported from the Eastern Hemisphere to America, perhaps as a weed seed in shipments of rice.

Some species occur in deserts with less than 10 inches of annual rainfall, others grow in tropical rain forest where the annual precipitation is 126 inches.

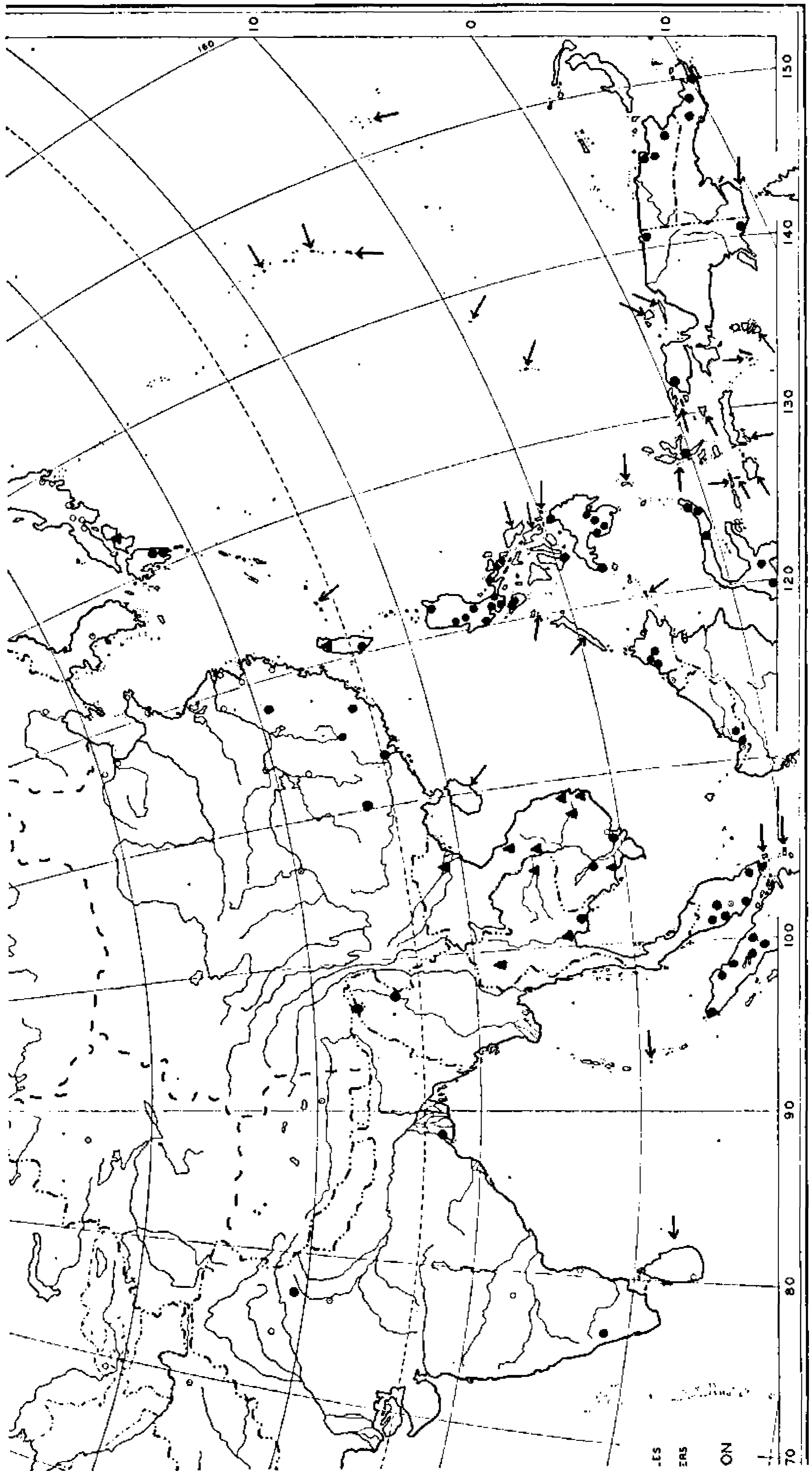


FIGURE 3.—Distribution of *Melochia* in Asia. *Melochia corchorifolia* is generally distributed in the hotter parts of India, from Kumaon to Sikkim, Malacca, and Ceylon [Hooker (26)].

● = cited in text ▲ = from the literature

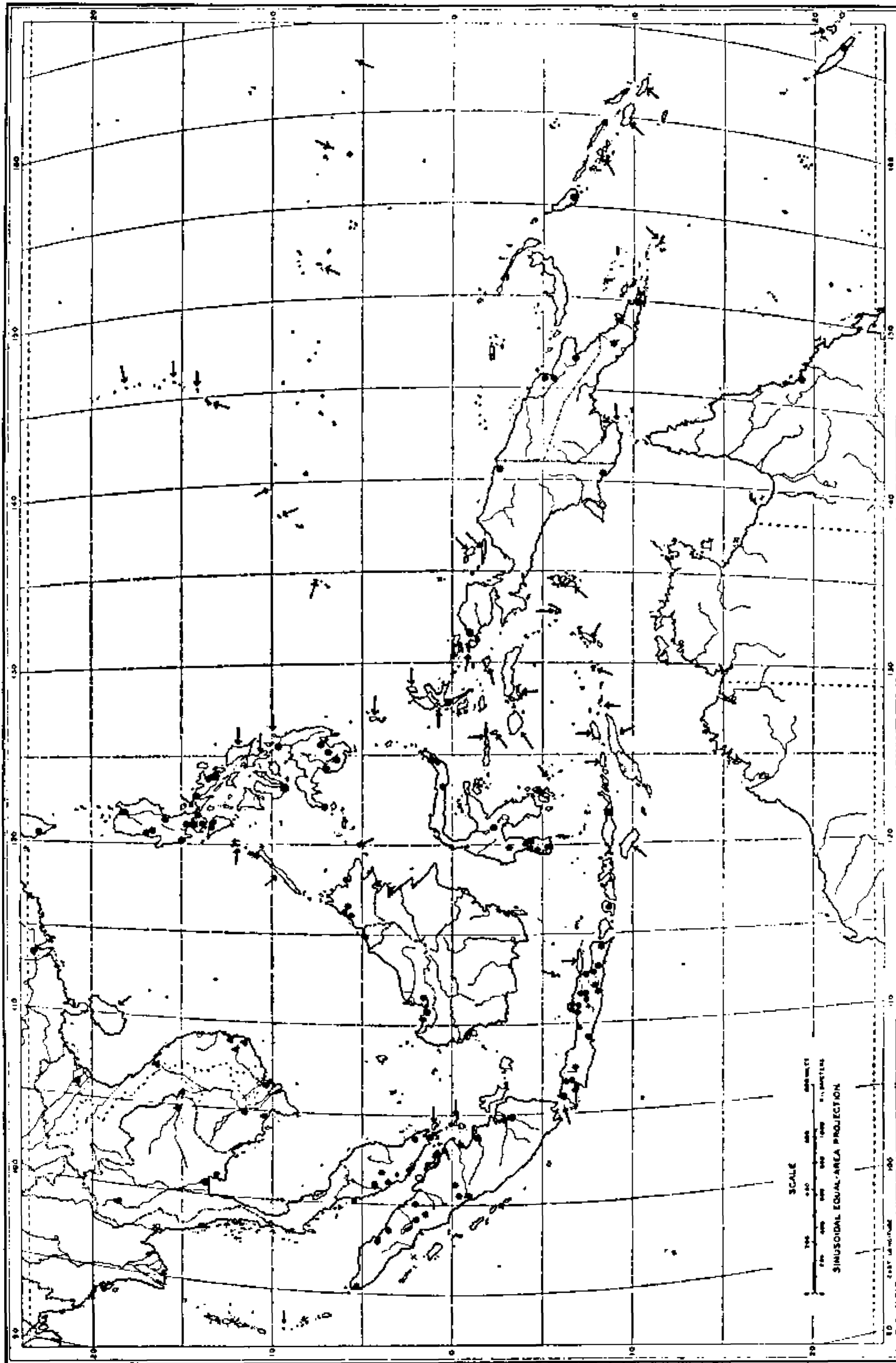


FIGURE 4.—Distribution of *Melochia* in the East Indies.

● = cited in text ▲ = from the literature

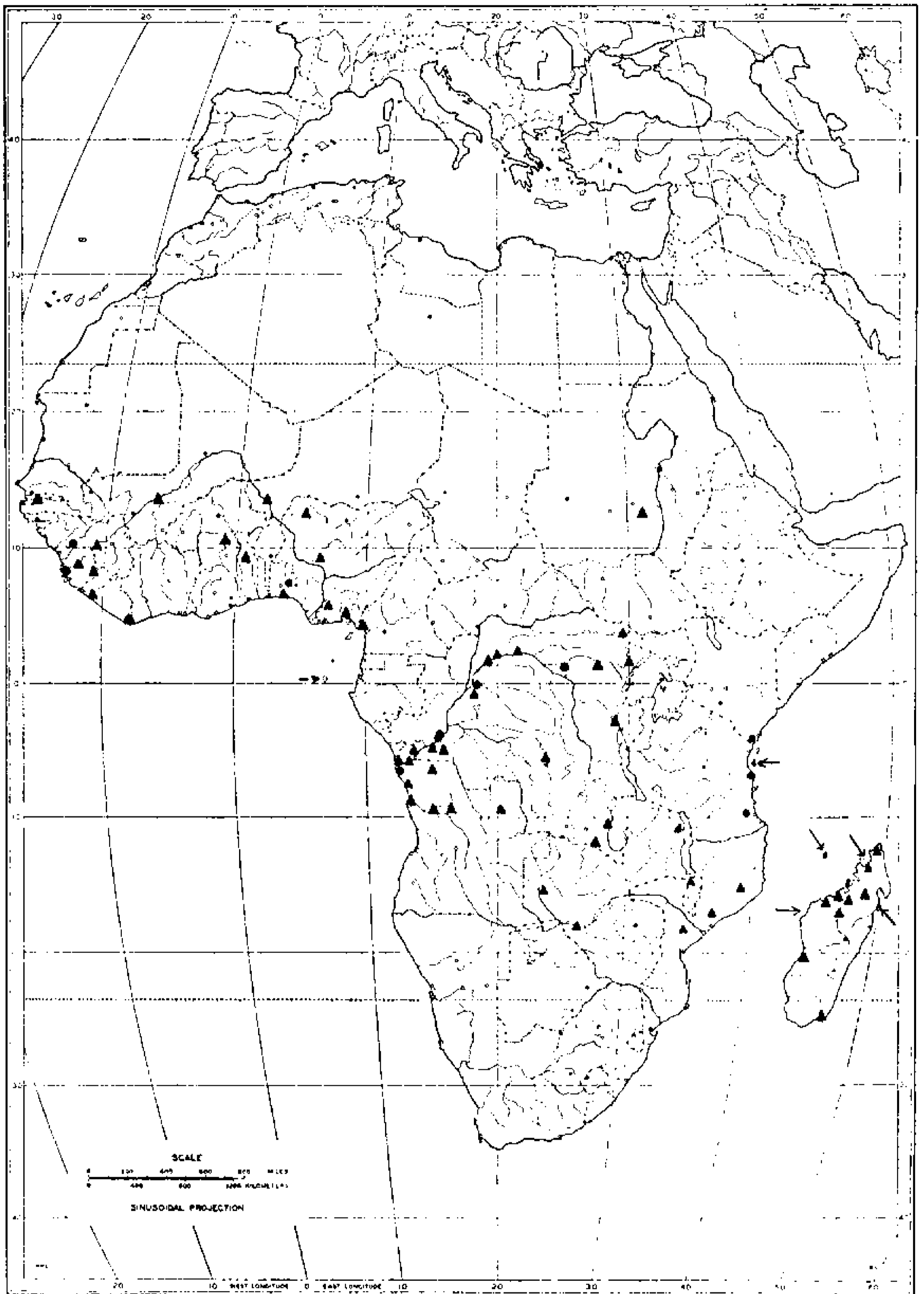


FIGURE 5.—Distribution of *Melochia* in Africa.

● = cited in text ▲ = from the literature

Taxonomic Characteristics

Most species of *Melochia* are perennial shrubs or subshrubs; a few are herbs or small trees. A taproot is usually present, but secondary roots are often numerous. The young stems sometimes are hollow or

have a large pith and are often provided with small, round lenticels. They may be pubescent or glabrous. The bast fibers of the stem are tough.

Several kinds of hairs occur in the genus. They may be stellate, with 3 to 13 rays, forked, simple, or glandular. The last are several cells long, with the distal cell enlarged.

The leaves are simple and alternate and vary greatly in size, shape, and pubescence between species, sometimes within species. Their margins are usually irregularly crenate-serrate.

The inflorescences are axillary, terminal, leaf-opposed (the peduncle leaving the stem 180° from the insertion of the petiole at the same node), or 90° from the leaf insertion. They are cymose. The peduncle may be simple, branched, or absent. The bracts and stipules are usually similar in shape, size, and pubescence.

The flowers are polypetalous, actinomorphic, perfect, and hypogynous. They are sometimes matutinal and sometimes fragrant and visited by honeybees. They are usually dimorphic, the gynoecium and androecium differing in length in flowers of different plants of a species. The condition may be slight or marked. In figure 6, 1A, 1B, 3A, and 3B illustrate the longistylous condition, and 2A, 2B, 4C, and 4D the brevistylous condition.

The five fertile stamens are antepetalous, and the filaments are free of the petals or partially attached to them. The filaments are partially or completely attached to one another. Staminodes are usually absent; sometimes there are five, usually dentiform, alternate with the fertile stamens. The anthers are ditheous, extrorse, and attached to the filaments at the middle. The pollen is smooth, usually globular and $34\text{--}49\mu$ in diameter. Sometimes, according to Erdtman (10), it is subprolate, and 51μ long and 44μ wide.

There are usually 5, rarely 6–8, carpels opposite the petals. The placentation is axile and the ovules are attached one-fourth to one-third the way up from the base of the carpel. The ovules are superposed and close to one another, and anatropous, with the funicle ascending on the adaxial surface of the ovule.

The calyx is campanulate, quinquefid, valvate in aestivation, and persistent. Sometimes glandular tissue is between the calyx and the corolla and between the bases of the petals.

The 5 petals are imbricate and contorted in aestivation and often marcescent. They are flat and veined.

The fruit may be subglobular, and more or less pentagonal (figure 6, 1D, 2D) or pyramidal and pentapterous (figure 6, 3C). A rostrum may be present (figure 6, 3C), or absent, or the apex of the capsule may be retuse (figure 6, 4E). A fairly long stipe may be present (figure 6, 4E) or it may be absent. Dehiscence of the fruit may be (1) septicidal

into cocci with a narrow ventral slit, (2) loculicidal all along the ventral suture, the cells gaping ventrally, and a fifth to half way along the dorsal suture, and sometimes eventually septicial (figure 6, 1c), or (3) loculicidal all along the dorsal suture and then often septicial (figure 6, 2d).

The embryo is straight, 1.5–2.7 mm. long, and embedded in fleshy endosperm. The cotyledons are suborbicular, 0.7–1.7 mm. in diameter, flattened, subcordate at the base and rounded at the apex. Sometimes 2 veins are on each side of the middle of the cotyledon; one pair is basal. The radicle is terete, 0.7–1.1 mm. long, 0.25–0.5 mm. wide, and inferior. A plumule is not evident in the seed stage. Venkata Rao (63) studied the early stages in the development of the embryo of *M. corchorifolia* L.

Cristóbal (6) studied the chromosomes of two species of *Melochia*. In both the diploid number was 18. According to Mangenot & Mangenot (41) the diploid chromosome number of *M. bracteosa* is 14.

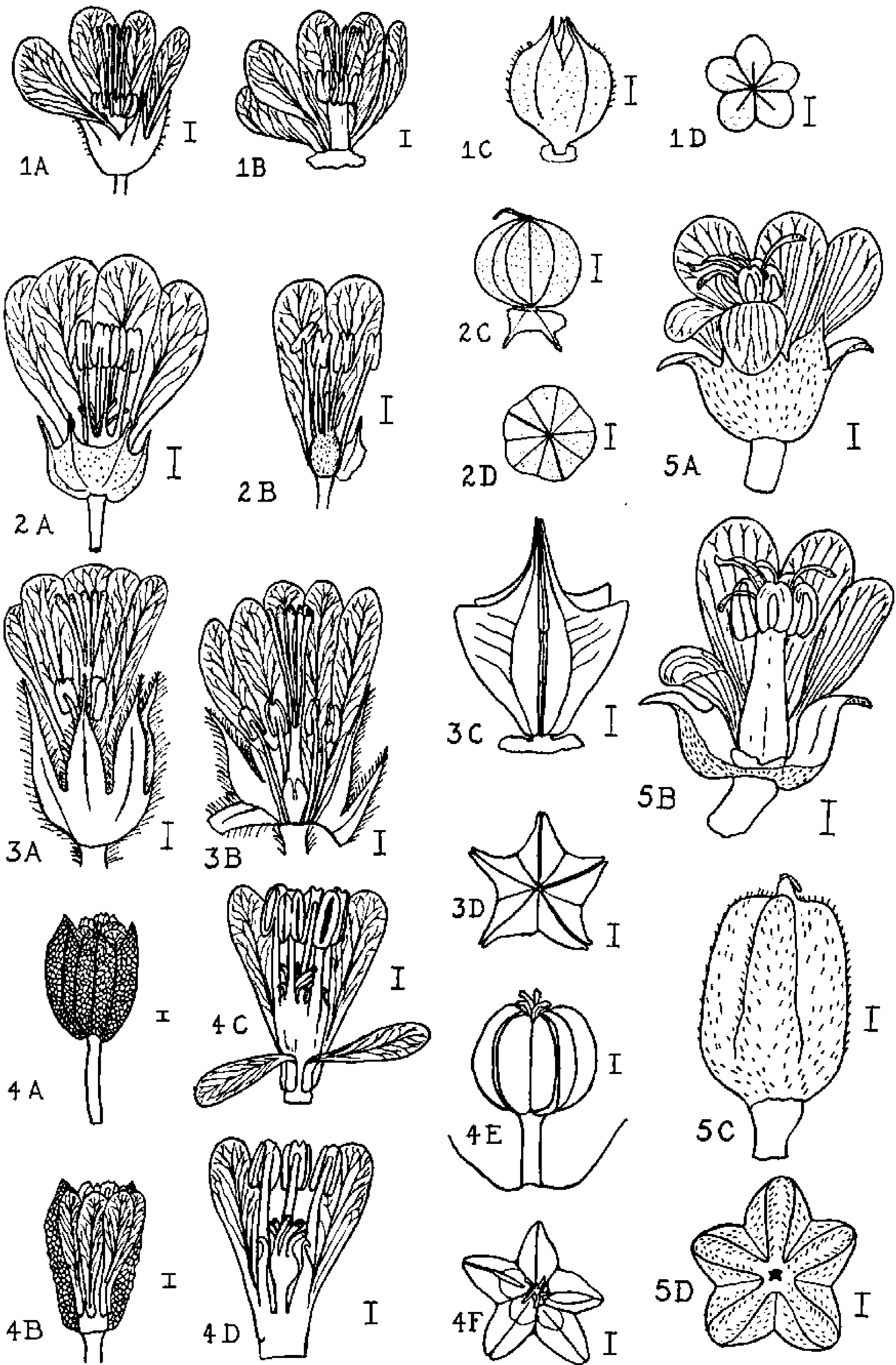
Plate 5 illustrates a typical species of *Melochia*. Some floral and fruit characters of a species of each section are illustrated in figure 6.

Taxonomic Position

Melochia is a genus of the family Sterculiaceae sensu lato, tribe Hermannieae.

Schumann (48) included eight tribes in the family. The flowers of the Sterculieae are polygamous, those of the other tribes are hermaphroditic. The petals of the Hermannieae and Helicteraeae are flat and usually longer than the calyx; those of the Buettnerieae are cucullate at the base and embrace the anthers, often ligulate at the apex, and usually not longer than the calyx. They are absent from the Sterculieae and Fremontieae, absent or minute, glandlike, or squamiform in the Lasiopetaleae, and large in the Dombeyeae. In the Lasiopetaleae the stamens are usually free; they are at least partly united in the other tribes. The staminal tube is greatly elongated in the

FIGURE 6.—Floral and Fruit Characters of *Melochia*. 1, *Melochia chamaedrys* St.-Hil. var. *chamaedrys*, Pedersen 971 (US): A, Flower, one petal removed; B, flower with calyx removed; C, fruit, lateral view; D, fruit, apical view. 2, *Melochia arenosa* Benth., flower, Dahlgren & Sella 65 (US); fruit, Gardner 2489 (US), syntype: A, Flower, one petal removed; B, flower with parts removed to show essential organs; C, fruit, lateral view; D, fruit, apical view. 3, *Melochia anomala* Griseb., Venturi 2108 (US): A, Entire flower; B, flower opened to show essential organs; C, fruit, lateral view; D, fruit, apical view. 4, *Melochia adenodes* A. Goldberg var. *adenodes*, Hinton 16203 (US), type: A, Entire flower; B, flower with calyx partly removed; C, D, flower with parts removed to show essential organs; E, fruit, lateral view; F, fruit, apical view. 5, *Melochia umbellata* (Houtt.) Stapf, flower, Krukoff 4421 (US); fruit, Bartlett 8367 (US): A, Entire flower; B, flower with parts removed to show essential organs; C, fruit, lateral view; D, fruit, apical view. (The scale at the right of each illustration represents 1 mm.)



Eriolaeneae and Fremontieae. The flowers of the Hermannieae have five fertile stamens with dithealous anthers; the stamens of the other tribes are sometimes more numerous and sometimes the anthers are more than dithealous. The gynophore is usually long in the Sterculieae and often so in the Helictereeae; it is usually short or absent in the other tribes. The carpels of the Sterculieae are usually separate at anthesis; they are at least partly united in the other tribes.

The tribe Hermannieae contains two subtribes, the Hermanninae and Melochinae. The former contains the genus *Hermannia*. Its pistil consists of five carpels opposite the calyx lobes. Each carpel contains an indefinite number of ovules. The styles are sometimes united at the apex. The seeds are reniform, the embryo is curved, and the cotyledons are oblong and twice as long as wide. The filaments are free or united part way, and the free part is often flattened and broader than the anthers. The anthers are relatively long (about 3 mm. long). The subtribe Melochinae contains *Melochia* and *Waltheria*. The pistil of *Melochia* consists of five antepetalous carpels. Each carpel contains two ovules. The styles are free to the ovary or united part way at the base. The seeds are not reniform, the embryo is straight, and the cotyledons are suborbicular. The filaments are united part way or up to the anthers and the free part is not broader than the anthers. The anthers are shorter (less than 3 mm. long). *Waltheria* differs from *Melochia* primarily in that its pistil consists of one carpel. In *Waltheria* the apex of the style is fimbriate.

Evolution and Relationships

Melochia belongs to a relatively primitive family, the Sterculiaceae, that probably originated at a time when the temperature did not go below freezing, at least not for any considerable period, and moisture was abundantly available in all latitudes. The family migrated from continent to continent. With changes in the climate, it did not survive in colder regions, but at present is well represented in tropical and subtropical areas throughout the world. *Melochia* probably originated in America and the great majority of the species occur here. Members of the genus with primitive characters range from southern Mexico to southern Brazil and northern Argentina, in southeastern Asia, and the Pacific Islands. The three species indigenous to Africa have relatively few primitive characters, and the one species indigenous to Australia is advanced.

Some species flower for extended periods under a variety of conditions; others reproduce only under particular conditions. The former species have a wide distribution.

Species of *Melochia* are usually perennial subshrubs or shrubs, but toward the latitudinal extremes of the range of the genus, and where

available moisture is reduced, the species become herbaceous, and a few are annuals which avoid the rigors of a cold or dry season. Other species have become adapted, by means of a dense indument, to withstand moisture stresses resulting from relatively cool or hot and dry conditions. In species with dense pubescence, stellate hairs are usually more abundant than other types. Stellate hairs occur most commonly in the sections *Pyramis* and *Physodium*; simple ones are most common in the sections *Melochia* and *Mougeotia*. The leaves of species growing in xerophytic habitats are usually thicker than in those that grow under mesophytic conditions. In some species, when the shoot is killed due to unfavorable seasonal conditions, the base of the stem and root remain alive and perpetuate the plant.

As a result of the change to a drier climate, mutant genes tending to enhance survival under xerophytic conditions accumulated. The plants became more compact, and thus conserved moisture by exposing less surface to the environment. For example, leaves became smaller and the internodes of the vegetative stems and inflorescences became shorter. The stipe is well developed in the section *Physodium* but is much reduced or absent in the other sections. The trend was from corymbiform, paniculate, and umbellate inflorescences to spicate, subcapitate, and capitate ones. As is frequently the case in capitate inflorescences, the entire flower or some of its organs become reduced in size. This is especially true of the calyx; in a few species the reduced calyx has become membranous. The sinus between the teeth of the primitive calyx is acute but rounded or truncate in the species with a reduced calyx, and the teeth are short and distant. This trend toward reduction of the calyx is most pronounced in the section *Melochia*. In some species of this section the internodes between the bracts have become reduced so that the latter immediately subtend the flowers; in other species the bracts are enlarged, closely invest the flowers, and take over the protective function of the calyx.

Although some species, such as *Melochia corchorifolia*, have accumulated mutations adapting them to xerophytic conditions, they have retained their ability to grow in mesophytic and hydrophytic habitats.

An evolutionary trend in many lines of organisms is the reduction and loss of parts. In *Melochia* this has occurred in the flower. Stamines, the vestiges of one of the cycles of stamens, are elongated and most evident in some species of the section *Physodium*. In several species, particularly those of the other sections, they are merely dentiform or entirely absent. The fertile stamens show a trend toward the loss of connective between the anther sacs, so that the species advanced in this respect have deeply emarginate anthers and divergent anther sacs. This is especially the case in the sections *Mou-*

geotia and *Melochia*. The common number of carpels is five, but species primitive with regard to this character frequently have six to eight. There are two ovules in each carpel, but in many species one aborts and only one seed develops.

The primitive colors of the petals appear to be yellow and orange, the most common colors in species of the section *Mougeotia*. In general, plants with rose or purple flowers are more attractive to hymenopterous insects. In a few species of *Melochia* with yellow or orange petals the essential organs are only slightly dimorphic, whereas the heterostylous condition in flowers of different plants of the same species, often associated with insect pollination, is quite evident in rose- and purple-flowered species, predominant in the other sections, except species in which the flowers have become considerably reduced in size.

It is the consensus among botanists that the organs of the flower are homologous with leaves and that, like leaves, in the primitive condition these organs are separate. All species of the genus have partially united sepals; however, the extent of union varies between species. In some species of the section *Melochia* two or three of the bracts may be partially united. In the section *Pyramis* the petals are attached to the staminal tube at the base. In some species of the sections *Mougeotia* and *Melochia* the petals are free of the staminal tube; in others they are attached to it at the base. In these two sections the claw is usually sharply demarcated from the blade of the petal, just as the petiole is demarcated from the blade of the leaf. In the section *Pyramis* the claw is usually not sharply demarcated from the blade of the petal. Ordinarily the petals are free from one another, but in one specimen of a species in the section *Pyramis*, I noticed that the claws were united. In the sections *Melochia* and *Mougeotia* the filaments in the longistylous form of the flower are usually united up to the anthers, but united to a lesser extent in the other sections. In the section *Physodium* the styles are free to the ovary, in the section *Mougeotia* they are usually free to the ovary, and often free in the section *Melochia*, but united at the base in the section *Pyramis*. The cells of the fruit vary in the extent united in the different species. In species of the section *Melochia* the cells are usually united for a greater distance along their sides than in species of the other sections.

The fruits of some species of the section *Mougeotia* dehisce in the most primitive manner, along the ventral suture, the site of union of the infolded carpel phyllomes, and in some species of this section dehiscence is also septicial. In the section *Visenia* the fruit dehisces ventrally, but it is incompletely septicial. In other sections dehiscence is first loculicidal along the dorsal suture, the most advanced

means of dehiscence in the genus, and in a few species of the section *Melochia* it is no longer also septicidal.

In *Melochia* the differences between many species are small. I believe that there has been little, if any, extinction of species in the genus. Perhaps the genus has diversified mainly as species became adapted to different climatic conditions and habitats.

Taking into account the above-mentioned evolutionary changes, geographical distribution, and the genetic principle that the similarity of structure among species of the same genus is primarily indicative of genetic relationship, I have arranged the species of *Melochia* according to my understanding of their relationships (fig. 7).

Acknowledgments

I wish to express my appreciation to Dr. Lyman B. Smith, Senior Scientist, United States National Herbarium, for his effort and time expended in my behalf and the patience he has shown in directing my research.

It has been a privilege to use the facilities of the United States National Herbarium for the study of specimens of *Melochia*. I am also grateful to other herbaria in America and Europe and their curators for the loan of specimens. Herbaria are abbreviated according to Lanjouw and Stafleu (34).

The portion of the paper dealing with the American taxa was submitted to the faculty of the Graduate Council of the George Washington University in partial satisfaction of the requirements for the degree of Doctor of Philosophy.

Figure 2 is based on map 19AA, McKinley Publishing Co., Philadelphia, Pa.; all other maps are based on Goode Base Maps, copyright by the University of Chicago Press.

Systematic Treatment

Melochia L.

Melochia L. Sp. Pl. I. 2:674. 1753.

Visenia Houtt. Handleid. 8:308. 1777.

Moluchia Medic. Malv. 10. 1787.

Meluchia Medic. in Staatsw. Vorles. Churpf. Phys. Oek. Ges. 1:217. 1791

Riedlea Vent. Choix. 37, pl. 37. 1803.

Altheria Thou. Gen. Nov. Madagascar. 19. 1806.

Mougeotia H. B. K. Nov. Gen. & Sp. 5:326, pl. 483, 484. 1823.

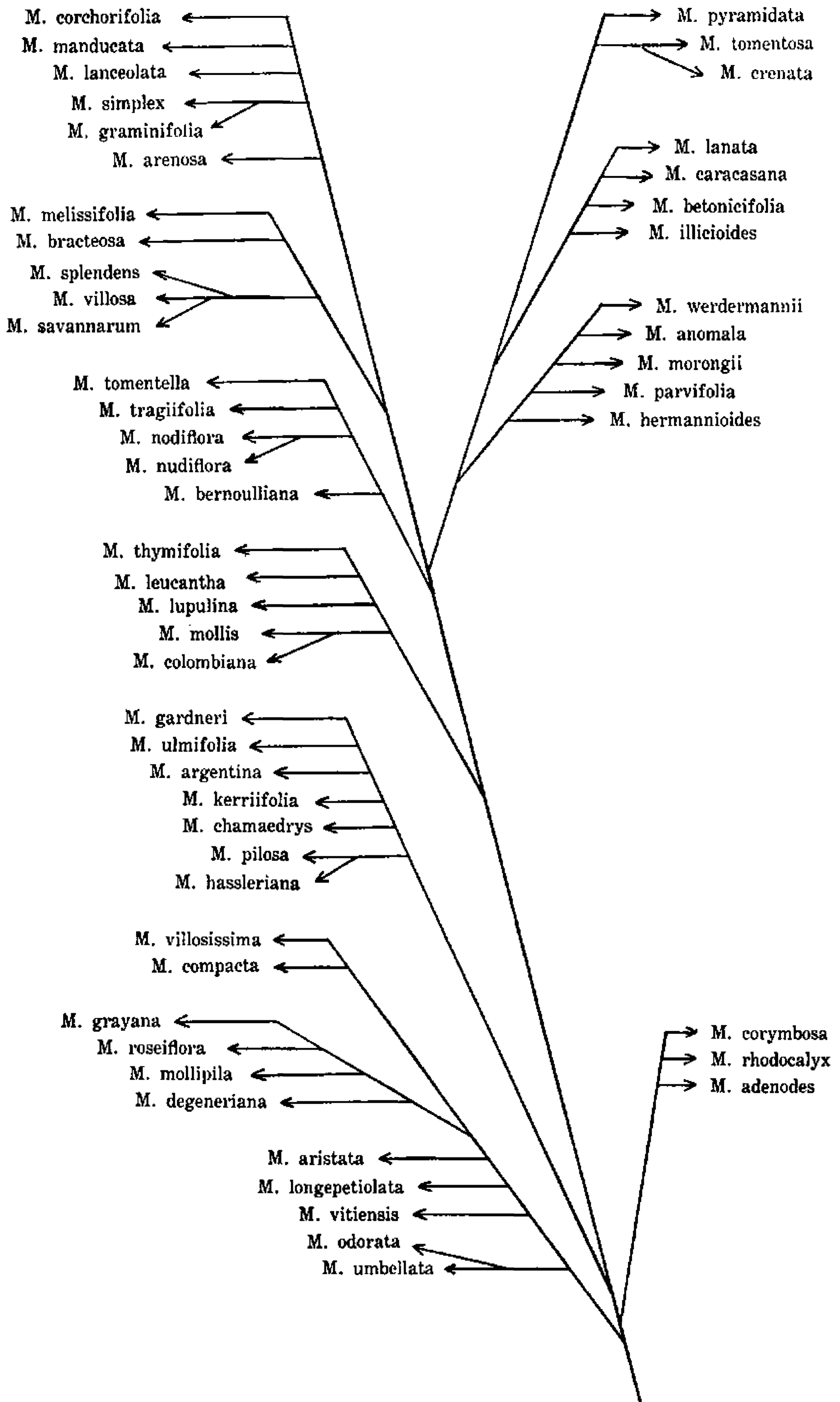
Riedleia DC. Prodr. 1:490. 1824.

Aleurodendron Reinw. in Sylloge Ratisbonn 2:12. 1828.

Glossospermum Wall. Cat. n. 1153. 1829.

Riedlia Dumort. Anal. Famil. 46. 1829.

Polychlaena G. Don, Gen. Syst. 1:488. 1831.

FIGURE 7.—Relationships of the species of *Melochia*.

Physodium Presl, Rel. Haenk. 2:150. 1836.

Lochemia Arn. in Ann. Sc. Nat. 2 sér. 11:172. 1839.

Ridleia Endl. Gen. 1000. 1840, attributed to Vent.

Riedleja Hassk. Catal. Pl. Hort. Bog. Alt. 205. 1844.

Anamorpha Triana & Karst. in Triana, Nuev. Jen. i Esp. Fl. Neo-Granad. 9. 1854.

Physocodon Turcz. Bull. Nat. Mosc. 31(1):212. 1858.

Mostly shrubs or subshrubs, sometimes herbs or small trees, 0.08–15.0 (–20) meters high, mostly perennial, often with a woody taproot, sometimes 2–5 times thicker than the base of the stem and 0.4–2.2 cm. wide, the young stems subglabrous to cinereous or canescent, hirsute, pilose, sericeous, or tomentulose, hairs stellate, simple, forked or glandular, sometimes tan, golden, or ferruginous, 0.05–4.0 mm. long, the internodes 0.2–18.5 cm. long; leaves simple, alternate; stipules 1.5–10.3 mm. long, 0.2–4.0 (–12) mm. wide, deltoid-acuminate or deltoid-acute, generally lanceolate or linear, sometimes ovate or suborbicular, usually ciliate and hirsute, tomentulose or sericeous, hairs simple, stellate, forked or glandular, 0.05–3.5 mm. long; petiole 0.07–14.5 (–20.5) cm. long; lamina 0.6–24 (–30) cm. long, 0.2–21.5 (–27) cm. wide, ovate, lanceolate, linear, oblong-ovate, suborbicular, or elliptic, one side sometimes larger than the other, the base usually rounded to cordate, sometimes truncate, cuneate or oblique, the apex usually acute to acuminate, sometimes rounded, both surfaces glabrous, hirsute, sericeous or tomentulose and canescent or cinereous or brownish, sometimes velutinous or lanate, hairs stellate, simple, forked, or a combination of these, sometimes also glandular, 0.05–4.0 mm. long, rarely covered with resin-colored granules or pulverulent, the margin usually irregularly crenate-serrate, serrations 0.3–12.0 mm. wide, 0.2–3.6 mm. high, 4–15 pairs of primary veins, usually 2 being basal, usually impressed above and prominent beneath.

Inflorescences axillary, terminal, leaf-opposed, or 90° from the leaf, umbellate, subcapitate, paniculate, spicate or corymbiform, cymose, 0.6–34 cm. long, the peduncle 0–11 (–16) cm. long, sometimes with a primary branch 0.2–5.2 (–7.0) cm. long, a secondary one up to 2.0 (–4.0) cm. long, a tertiary one up to 1.6 (–3.0) cm. long, and rarely a quaternary one up to 2 cm. long, the pedicel 0–14 (–19) mm. long; bracts 0.5–12.2 mm. long, 0.1–3.9 (–14) mm. wide, sometimes 2–3 immediately subtending each flower, at other times at the base of the pedicel, sometimes 2–3 united part way; flowers: few to numerous, fertile stamens 5, antepetalous, staminodes usually absent, sometimes 5, alternate with the stamens, 0.1–1.2 mm. long, usually dentiform, sometimes elongated, the anthers 0.4–2.6 mm. long, 0.3–1.4 mm. wide, oblong, emarginate at both ends, sometimes nearly to the middle from the apex, the carpels 5, rarely 6–8, antepetalous, styles filiform, sometimes slightly clavate at the apex, ovules 2 per carpel.

Calyx quinquefid, valvate in aestivation, persistent, usually green, sometimes rose, rose purple, yellow, orange, red, or pinkish brown, sometimes canescent, sometimes membranous, 1.4–15.0 mm. long, 2.1–10 mm. wide, the teeth 0.4–7.8 mm. long and 0.2–4.8 (–5.5) mm. wide, sometimes accrescent, becoming up to 36 mm. long and 19 mm. wide, with teeth up to 12 mm. long and 10 mm. wide, the teeth usually deltoid-acute or deltoid-acuminate, sometimes ovate or nearly linear, hirsute, tomentulose, or sericeous, sometimes ciliate, hairs simple, stellate, glandular, or forked, 0.05–2.3 (–4.0) mm. long, the sinus usually acute, sometimes rounded to truncate; petals purple, pink, purple distally and yellow or orange proximally, yellow, orange, white, blue, red, white with red stripes, or violet, 2.7–17.4 mm. long, 0.8–9.5 mm. wide, usually obovate or oblanceolate, sometimes obdeltoid, obovate-oblong, elliptic, oval, ovate or oblong, cuneate or spatulate, free of the staminal tube or attached to it for 0.3–5.0 mm., the claw 0–6.5 mm. long, rarely glandular tissue present between the calyx and corolla, with lobes extending between the bases of the petals, sometimes a few glandular, simple, forked, or stellate hairs on the petals.

Longistylous form. Stamens 2.4–7.0 (–9.0) mm. long, the filaments united up to the anthers or free for 0.2–3.0 mm., sometimes a few hairs at the base of the staminal tube; pistil 2.6–10.9 (–12) mm. long, the styles free for 1.2–6.7 mm., to the ovary or united for 0.3–4.0 mm., papillose at the apex for 0.5–2.5 mm.

Brevistylous form. Stamens 2.8–11.3 mm. long, sometimes with a few hairs at the base of the staminal tube, the filaments free for 0.5–7.5 mm.; pistil 2.3–6.9 (–8.0) mm. long, the styles free for 0.8–5.3 mm., to the ovary or united for 0.2–3.0 mm., papillose for 0.3–1.0 mm. at the apex.

The flowers of several species in the section *Melochia* not dimorphic, stamens and pistils 1.7–3.2 mm. long, the filaments free for 0–1.2 mm., the styles free for 0.6–1.2 mm., to the ovary or united for 0.1–0.3 mm.

Fruit schizocarp or capsule, 2.4–10.5 (–12) mm. long, 2.9–17.0 (–22) mm. wide, subglobular and pentagonal, pyramidal and pentapterous, ovoid or oblong, the sulci between the carpels shallow to deep, extending a fifth to half way to the center of the fruit, usually hirsute, tomentulose, or sericeous, subglabrous to canescent, hairs stellate or simple, sometimes also forked or glandular, 0.1–1.6 mm. long, the stipe 0–6.7 mm. long; dehiscence septicidal, loculicidal, or both; seeds brown to black, 1 or 2 per cell, 1.4–3.9 mm. long, 0.9–2.5 mm. wide, usually trigonal, the dorsal surface rounded and the sides flat, sometimes obovate, sometimes somewhat flattened, in one section the seed may have an ascending membranous wing 0.3–5.3 mm. high and 0.7–3.0 mm. wide.

The flowering and fruiting periods are usually long, sometimes throughout the year.

TYPE SPECIES: In the current International Code of Botanical Nomenclature (33), it is agreed to associate generic names which appear in Linnaeus' *Species Plantarum*, edition 1, 1753, with the first subsequent description given under those names in Linnaeus' *Genera Plantarum*. In edition 5, 1754, of the latter, Linnaeus cited Dillenius (9) under *Melochia*, and the latter only described *Melochia corchorifolia* in *Melochia*. I therefore consider *Melochia corchorifolia* L. to be the type species of the genus. The proposal of *M. pyramidata* L. as lectotype by Hitchcock and Green (International Botanical Congress, 1930) has no official standing.

DISTRIBUTION: In tropical and subtropical regions, from southern United States to northern Argentina and Uruguay, and the West Indies, India and southeast Asia, Indonesia, the Philippines, and other Pacific Islands to the Tuamotu Islands, in savanna, thickets, fields, or forests, sometimes on hillsides, usually in sun, in dry or wet habitats, on various types of soil, at 0-3,150 meters elevation.

Key to Sections of *Melochia*

1. Fruit slightly retuse at the apex, stipe 4.3-6.7 mm. long; calyx accrescent, becoming 15-36 mm. long; staminodes often present, up to 1.2 mm. long.
Section V. **Physodium**
1. Fruit not retuse at the apex, stipe 0-1.5 mm. long; calyx not accrescent or, if accrescent, not exceeding 13 mm. in length; staminodes rarely present, to 0.4 mm. long.
2. Fruit pyramidal (ovoid in *M. crenata*), pteratus, loculicidally dehiscent along the entire dorsal sutures (*M. hermannioides* tardily dehiscent), sometimes also dehiscent along the ventral sutures and septicial; inflorescences usually leaf-opposed Section IV. **Pyramis**
2. Fruit subglobular or ovoid, sometimes acute at the apex, apterous but dorsum of carpels sometimes keeled, dehiscence various; inflorescences axillary, terminal or both (sometimes also leaf-opposed in *M. degeneriana*).
3. Fruit first loculicidally dehiscent all along the dorsal suture, usually later septicial; sinus between calyx teeth usually rounded to truncate, rarely acute, teeth often distant; dorsum of carpels of fruit rounded.
Section III. **Melochia**
3. Fruit (1) septicially dehiscent into cocci with a narrow ventral slit or (2) loculicidal all along the ventral suture, the cells gaping ventrally, and usually also 0.2-0.5 the way along the dorsal suture, sometimes eventually septicial; sinus between calyx teeth usually acute, sometimes narrowly rounded; dorsum of carpels of fruit often somewhat keeled, especially at the distal end.
4. Fruit often falling apart, the dehiscence often completely septicial, carpels usually 5, rarely 6, seeds wingless; peduncle sometimes absent, usually without branches from it; herbs or shrubs, rarely a tree to 5 meters high Section II. **Mougeotia**

4. Fruit persistent, the dehiscence incompletely septicial, carpels often 6-8, seeds often winged, the wing 0.3-5.3 mm. high, 0.7-3.0 mm. wide; peduncle always present, usually branches from it; shrubs or trees to 15 (-20) meters high Section I. *Visenia*

Key to Species of *Melochia*

SECTION I. VISENIA

1. Fruit suboblong, intercarpellary sulci extending the entire length of the fruit, dehiscence usually only along the ventral sutures; stipules generally broad (5-12 mm. wide), usually suborbicular, the apex rounded; seed wing large (4-5.3 x 2-3 mm.) **1. *M. umbellata***
1. Fruit ovoid, intercarpellary sulci usually only marked in distal half of the fruit, dehiscence partly along the dorsal sutures as well as along the ventral sutures; stipules narrower (usually less than 4 mm. wide), deltoid, lanceolate or ovate, the apex acute or acuminate; seed wingless or wing smaller (0.3-3.5 x 0.7-2.2 mm.).
2. Leaves lanceolate or elliptic, narrow, 1.1-2.4 (-4.5) cm. wide, subcoriaceous; shrub 1.5-2 meters high. **9. *M. grayana***
2. Leaves mostly or all ovate, at least some 5 or more cm. wide; plant often more than 2 meters high.
3. Leaves persistently canescent, woolly on both surfaces, hairs to 1.2 mm. long; young stems densely hairy, hairs to 2.0 mm. long; flowers in rather compact cluster (i.e., pedicels short) **11. *M. villosissima***
3. Leaves glabrescent, hairs usually 0.5 mm. long or shorter (1 mm. long in *M. compacta*); hairs on young stems 0.6 mm. long or shorter.
4. Seeds wingless or if wing present less than 1 mm. long and wide.
5. Inflorescences usually compact, primarily due to short pedicels (mostly 0-2 mm. long); bracts relatively broad (0.8-3.0 mm. wide); internodes short (0.5-1.0 cm. long); indument relatively long (to 1.0 mm.); in longistylous form of the flower the filaments united up to the anthers or free for 0.5 mm. **10. *M. compacta***
5. Inflorescences fairly loose, the pedicels to 7 mm. long in fruiting stage; bracts narrower (0.5-1.7 mm. wide); internodes usually longer; indument shorter (to 0.5 mm.); in longistylous form of the flower the filaments free for 1.2-1.5 mm.
6. Calyx 5.8-8.6 mm. long; fruit 4-6 (-8) mm. long, sometimes without an arista; bracts 3.7-5.5 mm. long; leaf serrations to 2.4 mm. high; internodes 0.3-3.0 cm. long; seed not aristate. **2. *M. odorata***
6. Calyx 4.0-5.5 mm. long; fruit 6.2-10.5 mm. long, aristate; bracts 2 mm. long; leaf serrations to 1.5 mm. high; internodes 0.7-8.3 cm. long; seed sometimes aristate **5. *M. aristata***
4. Seeds winged, at least some wings 1 mm. or more long and wide (0.6-3.5 x 0.7-2.2 mm.).
7. Inflorescences long (17.5-21.5 cm.); petioles long (2-19 cm.); petals salmon pink **4. *M. longepetiolata***
7. Inflorescences shorter (3-14 cm.); petioles shorter (0.3-9.5 cm.); petals usually bright pink, yellow or white.
8. Petioles short (0.3-1.5 cm.) **8. *M. roseiflora***
8. Petioles generally longer (0.3-9.5 cm.).
9. Serrations of leaves up to 2.5 mm. high.

- 10. Fruit 4–6 mm. long, 4–6.5 (–8.0) mm. wide; calyx 5.8–8.6 mm. long, 6.1–8.0 mm. wide; petals usually pink.
 - 2. *M. odorata*
- 10. Fruit larger, 7–9 mm. long, 7.0–7.5 mm. wide; calyx generally smaller 3.5–6.0 mm. long, 3.8–6.7 mm. wide; petals yellow or white 3. *M. vitiensis*
- 9. Serrations of leaves up to 1.1 mm. high.
 - 11. Fruit 9–10 mm. long, 6–7.2 mm. wide; lower surface of leaf subglabrous 6. *M. degeneriana*
 - 11. Fruit smaller, relatively broader, 5–7.5 mm. long, 5.3–9.4 mm. wide; lower surface of leaf tomentulose.
 - 7. *M. mollipila*

SECTION II. MOUCEOTIA

- 1. Primary dehiscence septicial into cocci with a narrow slit along the ventral suture, sometimes also for 0.33–0.5 the way along the dorsal suture, or readily split for 0.25–0.5 the way along the dorsal suture.
- 2. Calyx considerably accrescent, becoming 7–12.3 mm. long, 7.7–12 mm. wide.
- 3. Calyx becoming 8–12.3 mm. long, and up to 12 mm. wide; peduncle slender and short, typically 0.3–0.5 mm. wide, and 0.1–0.7 cm. long, often 2 or 3 per leaf axil; hairs not brownish, predominantly simple on the upper surface of the lamina 22. *M. lupulina*
- 3. Calyx becoming 7–9.5 mm. long, 7.7–10 mm. wide; peduncle relatively thick and long, typically 0.5–1.5 mm. wide and 0.5–8.0 cm. long, usually 1 per leaf axil; hairs often brownish, stellate hairs predominant, or as common as the simple ones, on the upper surface of the lamina; lamina and stems more densely hairy than those of *M. lupulina*.
 - 19. *M. mollis*
- 2. Calyx not accrescent or only slightly so, 3.1–7.0 mm. long, 3–6.5 mm. wide.
- 4. Inflorescences slender, open, somewhat paniculate; peduncles very slender, 0–2.0 cm. long; pedicels slender and long, 3–7 mm. long; serrations of lamina large, up to 3.5 mm. high; lamina not canescent or cinereous, hairs simple and stellate on the upper surface . . . 24. *M. bernoulliana*
- 4. Inflorescences usually glomerate or corymbiform; peduncles sometimes absent; pedicels shorter, typically 1–3 mm. long; serrations of lamina shorter.
- 5. Inflorescences usually corymbiform, sometimes paniculate; young stems and leaves canescent-cinereous, hairs stellate, 0.1–0.3 mm. long.
 - 21. *M. leucantha*
- 5. Inflorescences neither corymbiform nor paniculate; young stems and leaves usually not canescent-cinereous, simple and longer hairs usually also present.
- 6. Internodes short, 0.4–0.7 cm. long; petioles short, 0.2–0.5 cm. long; peduncles 1.2–1.6 cm. long, branched 20. *M. colombiana*
- 6. Internodes and petioles usually longer than 1 cm.; peduncles often absent.
- 7. Peduncles relatively thick, 0.5–1.5 mm. wide, and usually relatively long, 0.5–8.0 cm. long, sometimes branched.
 - 19. *M. mollis*
- 7. Peduncles slender, usually shorter and not branched, often absent.
- 8. Young stems predominantly covered with glandular hairs; simple hairs on the upper surface of the lamina more or less erect; peduncle absent 27. *M. tragiifolia*

8. Young stems without glandular hairs or with very few; simple hairs on the upper surface of the leaf appressed.
9. Peduncle 0-4.0 cm. long; pedicels 0.5-3 (-4) mm. long; bracts narrow, 0.2-1.1 mm. wide 23. *M. thymifolia*
9. Peduncle 0-1.0 cm. long; pedicels usually shorter, 0-2 (-3) mm. long, bracts narrow or wide.
10. Leaves predominantly lanceolate and acuminate, up to 3.9 cm. wide 28. *M. tomentella*
10. Leaves predominantly ovate, usually acute, up to 7.7 cm. wide.
11. Bracts mostly broad, 0.6-3.9 mm. wide; lower surface of leaf tomentulose; inflorescences commonly terminal as well as axillary 26. *M. nudiflora*
11. Bracts narrow, 0.2-1.1 mm. wide; lower surface of leaf usually subglabrous; inflorescences glomerate, usually of numerous flowers, at up to 20 axillary nodes, usually not terminal too 25. *M. nodiflora*
1. Primary dehiscence of the fruit loculicidal along the ventral suture, so that the cells are gaping ventrally, and 0.2-0.5 the way along the dorsal suture, sometimes also finally septicidal.
12. Inflorescences corymbiform, open, fairly large, 6 cm. long, 5 cm. wide, axillary; lamina large, 5-14 cm. long, 2-8.2 cm. wide; a tuft of hairs 0.1-0.2 mm. long at base of petal blade; calyx and corolla short (4.3-6.1 mm. long) 17. *M. ulmifolia*
12. Inflorescences not corymbiform, sometimes contracted, often smaller, terminal, axillary, or both; lamina usually smaller, 0.8-9.5 (-12) cm. long, 0.2-7.5 cm. wide; no hairs at base of petal blade.
13. Inflorescence a dense terminal spike, sometimes also axillary, 4-5 cm. long; calyx (7-8.3 mm.), petals (11.6-12 mm.), pistil in longistylous form (11-12 mm.) and fruit (7 mm.) relatively long.
18. *M. gardneri*
13. Inflorescences axillary, or axillary and terminal, usually paniculate, racemose, or umbellate; calyx, petals, pistil in longistylous form and fruit often shorter.
14. Fruit large, 6.7-7.5 mm. long, 4.5-6.5 mm. wide; serrations of leaves large, 0.7-3.6 mm. high; leaves subglabrous; stamens and pistils subequal (4.8-5.6 and 4.2-5.1 mm., respectively).
16. *M. argentina*
14. Fruit smaller, 3.7-6.0 mm. long, (3-)3.5-5.6 mm. wide; serrations of leaves smaller, 0.3-2.7 mm. high; leaves sometimes quite hairy.
15. Inflorescences primarily or entirely axillary; lamina small, 1-4.3 (-6.5) cm. long, 0.8-3 (-4.5) cm. wide, usually broadly ovate or suborbicular; plant procumbent or ascending, small, 0.1-0.5 meter long 14. *M. chamaedrys*
15. Inflorescences primarily terminal; lamina usually larger, usually ovate or lanceolate; plant often erect and larger.
16. Fruits usually in pairs; leaves subglabrous; calyx short, 3-4.7 mm. long 15. *M. kerriifolia*
16. Fruits not in pairs; leaves usually scirceous-pilose; calyx usually longer, (4-) 4.6-7.8 mm. long.
17. Lamina long-ciliate, hairs on surfaces also long, 1.3-4.0 mm. long; peduncles 0.5-3.0 cm. long; pedicels 2.5-4.0 (-6) mm.

long; flowers evenly distributed about the inflorescence branchlets; inflorescences up to 6.5 cm. long.

13. *M. hassleriana*

17. Lamina not ciliate, hairs on surfaces up to 1.3 mm. long; peduncles and pedicels usually shorter; flowers sometimes more frequent on the upper side of the inflorescence branchlets; inflorescences to 20 (-31) cm. long and usually flowers more numerous 12. *M. pilosa*

SECTION III. MELOCHIA

1. Leaves linear, at least 10 times longer than wide, entire or obscurely serrate, glabrous or subglabrous 36. *M. graminifolia*
1. Leaves not linear, less than 10 times longer than wide, serrations evident.
 2. Leaves densely tomentulose, at least the lower surface canescent, all or almost all hairs very short (0.1 mm.), stellate, the rays numerous (8-12 per hair); inflorescences axillary, pedunculate, umbellate . 34. *M. arenosa*
 2. Leaves not tomentulose-canescens, or if so, inflorescences primarily terminal or if axillary, not pedunculate.
 3. Flowers not dimorphic, androecium and gynoecium equal in length; calyx short, 1.5-2.6 mm. long.
 4. Inflorescences principally or entirely terminal.
 5. Inflorescences subcapitate, leaves mostly ovate . 39. *M. corchorifolia*
 5. Inflorescences corymbiform, leaves lanceolate . . 38. *M. lanceolata*
 4. Inflorescences principally or entirely axillary.
 6. Fruit small, 2.4-2.5 mm. long, 3.2-3.3 mm. wide, with simple hairs; inflorescences not pedunculate; lamina small, 0.7-3.5 cm. long, 0.6-1.6 cm. wide 33. *M. melissifolia*
 6. Fruit larger, 2.7-4.0 mm. long, 3.8-4.8 mm. wide, with glandular and simple hairs; inflorescences often pedunculate; lamina larger, 3-7.5 cm. long, 0.9-6.2 cm. wide 37. *M. manducata*
 3. Flowers dimorphic on different plants, androecium and gynoecium differing in length; calyx usually longer, 2.4-6.0 mm. long.
 7. Leaves lanceolate to suboblong, nearly linear near the apex of the stem, a few scattered hairs on the upper surface; staminal tube glabrous; peduncles 0.2-4.1 cm. long 35. *M. simplex*
 7. Leaves usually ovate, if primarily lanceolate, then densely tomentulose; staminal tube usually puberulous; peduncles 0-0.1 cm. (rarely to 3.0 cm.) long.
 8. Plants small, usually prostrate, 0.2-0.6 meter long; lamina small, 1-2.2 cm. long, apex usually rounded (Isle of Pines and Pinar del Rio, Cuba) 30. *M. savannarum*
 8. Plants usually larger, more erect; lamina usually larger, 1.5-10.5 cm. long, apex usually acute.
 9. Inflorescences primarily terminal 29. *M. villosa*
 9. Inflorescences primarily axillary.
 10. Petiole short, 0.1-0.4 cm. long, base of lamina cuneate to rounded, serrations short, 0.2-0.8 mm. high; pedicels absent or very short, to 1 mm. long; calyx 5-5.2 mm. long; petals narrow, 1.7-2.0 mm. wide 31. *M. splendens*
 10. Petiole longer, to 2.3 cm. long, base of lamina rounded to subcordate, serrations higher, to 2.0 mm. high; pedicels present, longer, to 3.5 mm. long; calyx shorter, less than 5 mm. long; petals wider, to 3.5 mm. wide 32. *M. bracteosa*

SECTION IV. PYRAMIS

1. Upper surface of leaves densely sericeous-tomentose, yellow-tan-canescant, and lanate, hairs simple, appressed, 0.5–2.0 mm. long, lower surface densely tomentose, yellow-tan-canescant, hairs stellate, forked and simple, 0.7–1.6 mm. long; peduncles relatively thick, 1.2 mm. wide . . . 48. *M. lanata*
1. Upper surface of leaves not densely sericeous-tomentose, nor yellow-tan-canescant and lanate, hairs shorter and other types often also present, lower surface often not densely tomentose, hairs shorter; peduncles thick or slender.
 2. Fruit large, 10–12 mm. long, 19–22 mm. wide, chartaceous, truncate or very shortly rostrate (1 mm.) at the apex, alae relatively broad, and blunt at the lateral angle 45. *M. illicioides*
 2. Fruit smaller, 5–10.5 mm. long, 3.8–17 mm. wide, somewhat indurate, apex usually acute, rostrum short or long, alae usually narrower, and acute, acuminate or rounded at the lateral angle.
 3. Fruit ovoid, pentapterous, 10–10.5 mm. long, 6.7–8.7 mm. wide, the lateral angle of the alae obscure; pedicels long, 4–7 mm. long; lamina oval to broadly ovate, the apex rounded 50. *M. crenata*
 3. Fruit pyramidal, pentapterous, often smaller, the lateral angle of the alae evident; pedicels often shorter; lamina usually ovate or lanceolate, the apex often acute.
 4. Fruit narrow, both absolutely and relative to length, 6–7 mm. long, 3.8–4.8 mm. wide; entire plant canescant, tomentulose, hairs stellate, 0.3–1.0 mm. long; peduncles short and relatively thick, 0.2–0.8 cm. long, 1.2–1.5 mm. wide; pedicels short, 1.5–2.0 mm. long.
 44. *M. werdermannii*
 4. Fruit usually broader, 4–14 mm. wide; plant often neither canescant nor tomentulose, hairs sometimes simple, forked or glandular as well as stellate; peduncles sometimes longer and slender; pedicels sometimes longer, to 6 mm. long.
 5. Plants prostrate, small, 0.1–0.5 meter long; lamina small, 0.9–2.1 cm. long, 0.6–1.4 cm. wide, usually rounded at both ends, sometimes cuneate at the base, crenations relatively large, 0.5–1.9 mm. high, not extending to the base of the lamina; fruit tardily dehiscent, lateral angle of the alae above the middle of the fruit.
 40. *M. hermannioides*
 5. Plants usually erect, rarely decumbent, often larger; lamina usually larger, often acute at the apex, crenations or serrations relatively smaller, usually extending to the base of the lamina; fruit readily dehiscent, lateral angle of the alae usually at, or below, the middle of the fruit.
 6. Lamina usually obovate or elliptic, rarely ovate, the base cuneate or rounded, the apex rounded, relatively small, 0.6–4.5 cm. long, 0.3–2.8 cm. wide; petiole short, 0.1–1.2 cm. long; flowers usually white 41. *M. parvifolia*
 6. Lamina usually ovate or lanceolate, the base not cuneate, the apex often acute, usually larger; petiole usually longer; flowers often colored.
 7. Fruit relatively short and narrow, 6–7 mm. long, 4–5.8 mm. wide; peduncle often relatively long, up to 4 cm. long; calyx relatively long, 6.7–10.2 mm. long 42. *M. morongii*
 7. Fruit often longer and broader, typically 7–8.5 (–10.5) mm. long

- and 6.6–11 (–17) mm. wide; peduncle often shorter, typically to 2.5 cm. long; calyx usually shorter, typically 5–8.5 mm. long.
8. Peduncle short, typically 0–0.5 cm. long; pedicels short, 1–2 mm. long; fruit relatively narrow, (5.5–) 6.2–7.0 mm. wide; serrations of lamina fairly large, to 2.5 mm. high, hairs of lamina to 1.2 mm. long **43. *M. anomala***
8. Peduncle usually longer, typically 1–2 cm. long; pedicels usually 1–4 mm. long; fruit wider, typically 8 (–17) mm. wide; serrations of lamina usually smaller, hairs of lamina often shorter.
9. Peduncles slender, 0.4–0.6 mm. wide; inflorescences umbellate, typically 2–10 flowers per inflorescence; flowers usually purple, pink, violet, blue, or purple distally and yellow proximally.
10. Inflorescences mostly leaf-opposed; leaves usually sparsely pubescent, hairs simple, forked, stellate and sometimes also glandular; fruit often purple-blotched, rostrum 0–2.1 mm. long, point of alae acute or acuminate; plant 0.08–2.0 meters high; calyx 3.7–6.2 mm. long **51. *M. pyramidata***
10. Inflorescences mostly axillary; leaves often densely tomentose and canescent, hairs stellate; fruit not purple-blotched, rostrum 1.3–5.0 mm. long, point of alae acute or rounded; plant 0.3–4.0 meters high; calyx 5–8.6 mm. long **49. *M. tomentosa***
9. Peduncles relatively thick, 0.8–1.4 mm. wide; inflorescences subcapitate, typically 3–20 flowers per inflorescence; flowers usually white or yellow, rarely purple.
11. Peduncle usually axillary, 0.8–2.9 cm. long; fruit 11.5–17 mm. wide; lower surface of lamina sometimes canescent (Brazil) **46. *M. betonicifolia***
11. Peduncle often leaf-opposed, 0.4–2.0 cm. long; fruit 6–11 mm. wide; lamina generally more densely pubescent and hairs often yellowish (mostly Venezuela and Colombia) **47. *M. caracasana***

SECTION V. PHYSIDIUM

1. Petals 16–17.4 mm. long, 5.6–9.5 mm. wide, markedly exceeding the calyx in length at anthesis; hairs of calyx stellate, 0.2–0.5 mm. long; staminodes none or rarely 0.1 mm. long **53. *M. rhodocalyx***
1. Petals 8–12 mm. long, 2–2.7 mm. wide, not exceeding or slightly exceeding the calyx in length at anthesis; hairs of calyx stellate or glandular; staminodes none or to 1.2 mm. long.
2. Calyx and pedicels covered with glandular hairs 0.2–0.6 mm. long and a few stellate hairs 0.1–0.2 mm. long; petals 8–12 mm. long, 2–2.7 mm. wide, not exceeding the calyx in length at anthesis; staminodes 0.2–1.2 mm. long **52. *M. adenodes***
2. Calyx and pedicels covered with stellate hairs 0.1–0.8 mm. long; petals 9.7 mm. long, 2.1 mm. wide, slightly exceeding the calyx at anthesis; staminodes none **54. *M. corymbosa***

**Section I. *Visenia* K. Schum. in Engler & Prantl, Pflzfam. III
6: 81. 1890**

Shrubs or small trees 0.7–15 (–20) meters high, the young stems and petioles tomentulose or tomentose, hairs fuscous or cinerescent, stellate, and often also forked and simple, 0.05–2.0 mm. long, the internodes 0.2–18.5 cm. long; stipules often soon deciduous, 2–10 mm. long, 0.5–12 mm. wide, deltoid-acute or deltoid-acuminate, lanceolate, ovate or suborbicular, tomentulose, hirsute, sericeous-tomentose, ciliate or subglabrous, hairs stellate, forked or simple, 0.05–2.0 mm. long; petiole 0.3–14.5 (–20.5) cm. long.

Lamina 3.1–24 (–30) cm. long, 1.1–21.5 (–27) cm. wide, usually broadly ovate, sometimes lanceolate, rarely elliptic, the base rounded to cordate, rarely cuneate or truncate, the apex acute, rarely acuminate or rounded, the upper surface tomentulose, sericeous-tomentulose, canescent and woolly or velvety to the touch, or glabrous, hairs stellate and usually also forked and simple, 0.05–1.2 mm. long, sometimes also minute resin-colored granules scattered over the surface, the lower surface with similar indument but never completely glabrous, the margin usually irregularly crenate to serrate, crenations or serrations 0.9–8.3 mm. wide, 0.3–3.0 mm. high, 5–10 pairs of primary veins, 1–3 are basal.

Inflorescences loose or compact, 2.5–21.5 (–39) cm. long, in axils of 1–6 upper leaves, sometimes apparently also terminal, rarely leaf-opposed or 90° from a leaf axil, or not associated with a leaf, corymbiform, branched, the ultimate divisions umbellate, the umbels 2–5-flowered, the flowers numerous, moderate or few, sometimes fragrant, the peduncle 2–11 (–16) cm. long, usually with a primary branch 0.4–5.2 (–7.0) cm. long, often with a secondary one 0.3–2.0 (–4.0) cm. long, and sometimes with a tertiary one 0.5–1.6 (–3.0) cm. long, and rarely with a quaternary one to 2 cm. long, the pedicel 0–7 mm. long; bracts sometimes soon deciduous, rarely 2 united, 1.0–5.5 (–10) mm. long, 0.1–3.0 (–14) mm. wide, ovate, lanceolate, or deltoid, rarely linear, apex usually acute, sometimes rounded, tomentulose, hirsute or ciliate, hairs stellate, sometimes also forked and simple, 0.1–0.4 (–1.3) mm. long.

Calyx sometimes orange to bright red, pinkish brown or yellow green, 3.5–9.0 mm. long, 3.8–10 mm. wide, tomentulose, sometimes also sericeous, hairs stellate, sometimes also forked, simple, or glandular, 0.05–0.5 (–1.5) mm. long, the teeth 1.2–5.5 mm. long, 1.3–4.8 mm. wide, deltoid to ovate, acute or acuminate, the sinus acute to narrowly rounded; petals usually pink to red, sometimes white to yellow, rarely pale blue, pale purple, violet, or lilac with a proximal orange spot, 5.0–9.0 (–15.5) mm. long, 1.6–5.0 (–7.5) mm. wide, obovate, oblanceolate, elliptic, oval, ovate or oblong, the apex usually

rounded, rarely emarginate, the base acute, attached to stamens for 0.8–3.0 mm., the claw 0.5–3.0 mm. long; sometimes glandular tissue present with lobes extending between the bases of the petals.

Longistylous form. Stamens 4–6 mm. long, the filaments often yellow, sometimes rose, united up to the anthers or free for 0.2–2.0 mm., the anthers yellow, 1.2–2.2 mm. long, 0.6–1.4 mm. wide, oblong, emarginate at both ends, usually deeply so at the apex; pistil 5.2–9.0 mm. long, the styles filiform, often slightly clavate, papillose for 0.6–2.0 mm. at the apex, free for 2.9–6.0 mm., to the ovary, or united for 0.5–1.0 mm., the ovary ovoid or elliptic, the ovary and base of styles usually densely sericeous, sometimes tomentose or hirsute, hairs simple, forked, and sometimes also stellate, 0.5–1.8 mm. long, the carpels sometimes 6–8, stipe none.

Brevistylous form. Stamens 4.7–8.1 mm. long, the filaments free for 1.8–5.0 mm., the anthers 1.0–2.5 mm. long, 0.7–1.4 mm. wide, rarely staminodes present, 0.1–0.2 mm. long; pistil 3.6–5.3 mm. long, the styles filiform, papillose for 0.6–0.8 mm., free for 1.4–2.6 mm., usually to the ovary, sometimes united for 1 mm., the ovary globular or ovoid, usually densely sericeous, sometimes sericeous-tomentose or hirsute, hairs simple and forked, 0.7–1.7 mm. long, the carpels sometimes 6–8, stipe none.

Fruit a green, brown or purplish-red capsule, ovoid or oblong, 4–10.5 mm. long, of which the arista is 0–2.0 (–3.0) mm. long, 4–9.4 mm. wide, the dorsum of carpels obtuse or subacute, the sulci between the carpels in the distal half of the fruit or extending for its entire length, shallow or deep, extending a fifth to half way to the center of the fruit, tomentose, tomentulose, or sericeous, hairs simple, forked, and stellate, the last short, 0.1–1.6 mm. long, the stipe (base of capsule) 0–1 mm. long; dehiscence all along the ventral sutures, sometimes also a fifth to half way along the dorsal sutures and partly septicial; seeds 1 or 2 per cell, the body brown, trigonal, 1.8–3.5 mm. long, 1.1–2.0 mm. wide, sometimes testa loosened for 0.2–0.5 mm., or with an arista 0.7 mm. long, or with an ascending wing 0.3–5.3 mm. high, 0.7–3.0 mm. wide, obliquely deltoid or adaxial edge straight and abaxial edge convex, the apex rounded or acute.

A few species produce flowers and fruit throughout the year, others have a restricted flowering and fruiting period.

TYPE: *Melochia umbellata* (Houtt.) Stapf.

DISTRIBUTION: India and Southeast Asia, Indonesia, the Philippines, and other Pacific islands to the Tuamotu Islands, in forests, thickets, and disturbed areas, under wet or dry conditions, on soils or rocks of calcareous or volcanic origin, at 0–1,400 (–1,700) meters elevation.

1. *Melochia umbellata* (Houtt.) Stapf, Kew Bull. 317. 1913.
Visenia umbellata Houtt. Handleidung 8:309. 1777.
Wisenia indica Gmel. Syst. 2:515. 1791.
Riedleia tiliaefolia DC. Prod. 1:491. 1824.
Riedleia velutina DC. Prod. 1:491. 1824.
Aleurodendron album Reinw. Sylloge Pl. Ratisbonn, 2:12. 1828.
Glossospermum velutinum (DC.) Wall. Cat. n. 1153. 1829.
Pentaglottis tomentosa Wall. Cat. n. 1156. 1829.
? *Glossospermum ?cordatum* Wall. Cat. n. 1155. 1829.
Melochia arborea Blanco, Fl. Filip. 524. 1837.
Hypericum pentandrum Blanco, Fl. Filip. 614. 1837.
Visenia Javanica Jungh. in Hoev. & DeVriese, Tijdschr. 7:302. 1840.
Riedleia Aleurodendron (Reinw.) Steud. Nom. ed. 2, 2:459. 1841.
Riedleia cordata (Wall.) Steud. Nom. ed. 2, 2:459. 1841.
Riedleia Wallichiana (Wall.) Steud. Nom. ed. 2, 2:460. 1841.
Visenia alba (Reinw.) Endl. ex Walp. Rep. 1:351. 1842.
Visenia tomentosa Miq. Anal. Bot. Ind. 3:4. 1852.
Visenia velutina (DC.) Turcz. Bull. Soc. Nat. Mosc. 31(1):212. 1858.
Melochia velutina Wall. ex. Bedd. For. Man. Bot. 35. 1869 or 1871.
Melochia indica Kurz, Prelim. Rep. For. Veg. Pegu, App. A, 23. 1875.
Melochia indica var. *deglabrata* Kds. & Val. Bijdragen tot de Kennis der
Boonsoorten van Java 2:194. 1895.
Melochia odorata var. *Schlechteri* Mildb. Engl. Bot. Jahrb. 62:350. 1929.

Usually a small tree, sometimes a shrub, 2-15 (-20) meters high, 4-15 (-35) cm. in diameter, the ramification ascending to horizontal, the bark about 4 mm. thick, rather smooth to rough, pale brown to dark grey brown, with some longitudinal ridges, the wood straw, the young stems and petioles woolly to the touch, tomentulose, hairs stellate, 0.1-1.0 mm. long, often yellowish brown at base, the internodes 1-7 cm. long; stipules deciduous, 4.3-10 mm. long, (1.1-) 5-12 mm. wide, ovate to suborbicular, the apex usually rounded, covered with simple, forked and stellate hairs 0.1-0.5 mm. long; petiole 2.5-11 (-20.5) cm. long.

Lamina 6.3-14.8 (-30) cm. long, (2-) 3.8-14 (-27) cm. wide, usually broadly ovate, the base rounded to cordate, the apex acute, often lanceolate and much reduced just below the inflorescence, both surfaces of young leaves covered with stellate hairs, rarely also simple and forked, 0.1-0.5 mm. long, woolly or velvety to the touch, larger hairs sometimes yellow brown at base, often minute resin-colored granules scattered on surface, young leaves somewhat canescent, older ones glabrescent, the margin irregularly crenate-serrate, serrations 1.8-6.0 mm. wide, 0.5-3.0 mm. high, 7-10 pairs of primary veins, 2 or 3 are basal.

Inflorescences fairly loose, in axils of upper 3 or 4 or more leaves, 3.7-16 (-39) cm. long, corymbiform, the flower number moderate, the ultimate divisions umbellate, the umbels 3-5-flowered, the peduncle (2.8-) 4-6.5 (-11) cm. long, with a primary branch 0.5-2 (-5.5) cm.

long, a secondary one 0.5–2(–4) cm. long, sometimes a tertiary one 0.5–1.3 (–3) cm. long, rarely a quaternary one to 2 cm. long, the pedicels 1–3 mm. long; bracts (1–) 2.5–5.3 (–10) mm. long, 0.7–2.3 (–14) mm. wide, ovate to lanceolate, the apex rounded or acute, covered with stellate hairs 0.1–0.3 mm. long.

Calyx yellow green to pinkish brown, 4.8–6.2 (–7.0) mm. long, 4–5.7 mm. wide, covered with stellate hairs 0.1 mm. long, and less numerous simple, forked, and stellate hairs to 0.6 mm. long, the teeth 2–3.4 mm. long, 1.4–3.3 mm. wide, deltoid to ovate, acute or slightly acuminate, the sinus acute; petals usually pink (light pink to red), sometimes white to yellow and sometimes orange proximally, rarely pale blue, pale purple or violet, (5.5–) 6–7.2 mm. long, (1.9–) 2.2–3.7 mm. wide, obovate, oblanceolate, or elliptic, attached to the stamens for 1–2 mm., the claw 0.5–1.5 mm. long, usually glandular tissue present with lobes extending between the bases of the petals; filaments and styles cream, anthers yellow.

Longistylous form. Stamens 4–4.9 mm. long, the filaments united up to the anthers or free for 0.2–0.9 mm., the anthers 1.2–1.6 mm. long, 0.8–1.0 mm. wide, oblong, slightly narrower at apex, emarginate at both ends, almost to the middle from the apex; pistil (6.2–) 6.6–7.6 mm. long, the styles free for (3.5–) 4.2–5.2 mm., united for 0.5 mm., papillose and clavate for (1–) 1.3–1.7 mm. at the apex, the base hirsute, the ovary ovoid, pentagonal, densely hirsute or sericeous, hairs forked, simple, and stellate, 0.5–1.3 mm. long, stipe none.

Brevistylous form. Stamens 5.5–6.4 mm. long, the filaments free for 3.3–5.0 mm., the anthers 1–1.2 mm. long, 0.7–1.0 mm. wide; pistil 4.6–5.2 mm. long, the styles free for 1.8–2.5 mm., nearly to the ovary, papillose for 0.6 mm., the ovary densely hirsute, hairs mostly forked and simple, to 1 mm. long, stipe none.

Fruit green, brown or purplish red, 8–9.5 mm. long, 6.3–7.5 mm. wide, oblongish, only slightly narrower at the apex, the sulci between the carpels deep, extending nearly half way to the center of the fruit at both apex and base, the sides of the carpels cohering only for a very short distance at the base, covered with stellate hairs 0.1 mm. long and simple, forked, and stellate hairs 0.5–1.0 mm. long, the stipe 0–0.5 mm. long; dehiscence along the ventral sutures; seeds winged, the body brown, 2–3.3 mm. long, 1.5–2.0 mm. wide, the wing ascending, 4–5.3 mm. high, 2–3 mm. wide.

Flowering and fruiting specimens collected throughout the year, peak of flowering May–August, fruiting June–August.

TYPE LOCALITY: East Indies, probably Java.

DISTRIBUTION: Indigenous from India to New Guinea, often common in secondary thickets, in recent clearings, along the edges

of forests and rivers, often in red calcareous soil, often in localities affected by monsoons, at 0-1,400 (-1,700) meters elevation.

INDIA: TERR. CANARA (KANARA): Mercara and Dharwar, ?Metz 623a (S). Car Nicobar, Prain March 1891 (US).

INDOCHINA: AUSTRAL-CHOCHINCHINAE: Dinh ad Baria gallicae, Pierre 544 (L, ?US). TONKIN: Rive droite de la rivière Novie entre C. Thap. et les roches de Notre-Dame, Balansa 3719 (L). ANNAM: Dabac, Hout Donai, Poilane, s.n. (S).

MALAYA: PERAK: Dr. King's Collector 8401 (L). Kampong Tembok, 3 mi. N. of Ipoh, Sinclair 9854 (L). ?PERAK: Father Scortechini s.n. (US). SELANGOR: Kepong Plantation, Symington Kepong Field No. 32872 (L). PAHANG: Sabai Estate, Bentong, Kemanshul Div., Shah 258 (L).

IND. OR. HERB. Wallich 1156 (L). Isotype of *Pentaglottis tomentosa* Wall.

SUNDA ISLANDS: SUMATRA: Singarong agong, Robinson & Kloss May 24, 1914 (US) ?Indrapoera, Korthals s.n. (L). Malintang, Bunnemeijer 3793 (L). SIBOLANGIT: Karohoogvl by Sarinembah, Galoengi 16 (L). BERKOELLEN: Kebana-goeng, de Voogd 1200 (L). Djambi. S. Lesing by Pahoe, Posthumus 1015 (L), 1059 (L). TAPIANOELI: TOBA: Toetoeapan, Boeea 5978 (L). Toba, Duwochond 252 (L). Near Tarontoeng, Bartlett 8367 (L, US). Palembang, Bamas, Grashoff 170 (L), 1091 (L). ?Paoe Palembang, Forbes 2546 (L). N. SUMATRA: Deli, Padang and Bedagei to Bila, Karohochebene, bei Jongging, am NW. Toba See, Lörzing ?1758a (L), 7987 (L), 8075 (L), 15058 (L), 15965 (L). WEST COAST: Koerintjo Bt. te Bakar, Binnemeyer 8174 (L). CENTRAL SUMATRA: Mt. Sago near Pajakumbuh, Maradjo (ass. W. Meijer) 14 (L). EAST COAST: Padang, Stomps 11-10-1923 (L). ASAHAN: Peddaloeng, Bartlett & LaRue 136 (L), 139 (L). Hoeta Padang, Asahan, Krukoff 4421 (L, US). Adian Rindang, Asahan, Boeea 8726 (L). Vicinity of Loemban Ria, Asahan, Hoeta Bagasan, Boeea 6863 (S, US), 7287 (US), 7530 (S), 7902 (S, US). LABOEHAN BATOE: Kota Pinang, Langga Pajoeng on the Soengei Kanan, Toroës 3636 (L, S, US). Si Mandi Angin on the Soengei Kanan, Toroës 3957 (US). KRAKATAU (KRAKATOA): Brenlage s.n. (L). P. Rakata, SE. side, v. Borssum Woolkes 1024 (L). Verlaten Eiland, Backer s.n. (L). JAVA: ?Waitz s.n. (L). Junghuhn 408 (L). Zollinger 34 (L). H. Lugo Batar s.n. (S). ?Reinwardt 2350 (S). East Java, Reinwardt s.n. (S). Schierbrand s.n. (W). Tjibodas, Raap 766 (L). G. Malabar Poentjak gede, Monerie 40 (L). Montis Sebu, Sorü, Junghuhn s.n. (L). Bagelen, Vorderman s.n. (L). Bandoeng, Popta 542/98 (L). Meester Cornelis, Backer s.n. (L). Solak, Möller s.n. (S). Buitenzorg and vic., Danser 5573 (L), Sutrisno 25 (L), Schuurman 33 (L), Soegandiredja 233 (L), Durand 818 (L). BANTAM: TJIMARA: Oedjoeng, Koorders, 7744 β^* (L). G. Pangissan, Koorders 7744 β (L). G. Karang, Koorders 7743 β (L). Batavia, Koorders 30901 β (L), Backer 88 (L). Res. Batavia G. Salak, Koorders 24411 β (L). Depok, Hallier Aug. 24, 1896. BANEAN: Tandjoeng Tajar, Karta 148 (L). Soerabaja, Doyeli 383 (L), 786 (L), 950 (L). Paroeroean, Backer 7810 (L), 37444 (L). P. Purmerend, middle of the island, den Hoed 3063 (L). Japara, Socmanding, Neth. Ind. For. Service Ja: 3724 (L). MADIOEN: Pandan, Kendeng, Trinil, Elbert 447 (L), 506 (L). Lawoe, Djogolaranga, Oosbooch, Kali Djeplog, Elbert 278 (L). Vak 112 houtrestery Toeloeng, Wind 6289 (L). G. Wilis Ngebel, Koorders 7746 β (L). PROV. PREANGER: Ploem s.n. (L). Takoka, Koorders 15155 β (L). SEMARANG: Kedoengdjati, Koorders 7740 β (L), 7745 β (L), 7748 β (L), 7749 β (L). Pangent-jongan, Koorders 7742 β (L), 14024 β (L). Palaboean ratoe, Koorders 7738 β (L), 7739 β (L), 7741 β (L). Telomojo, Koorders 27970 β (L). Karangasem, Koorders 7747 β (L). Tjiratjap Djampang koelon, Backer 17394 (L). Reg. Tjadas

Malang bij Tjidadap. L. v. Tjibeber Pasir Anger, *Winckel* 113 β (L), 161 (L), 1356 β (L), Bat. huizen *v/d Brink* 99a (L). Tjatjaban, and in the ravine of the river Tji Taroem, *Hochreutner* 1667 (L). Res. Semarang. Telomojo, *Koorders* 27970 β (L). Res. Kedoe G. Sendoro, *Koorders* 11354 β (L). Res. Besoeki Poeger, Banjoewangi, *Koorders* 7753 β (L), 7756 β (L). Prov. Banjumas. Pringambo, *Koorders* 7752 β (L), *Koorders* 37048 β (L). Res. Besoeki Rogodjampi, *Koorders* 29088 β (L). Res. Kediri. N. v. Tritik grens Kediri-Rembang, *Thorenaar* 102 (L). Pekalongan. Soebah, *Koorders* 11608 β (L), 11609 β (L). Southeast Java, *Forbes* 1343 (L). CENTRAL JAVA: G. Muria, Tjollo, N. of Kudus, *Kostermans* 6264 (K, L). WEST JAVA: 18 km. S. of Rangkasbitung, *Buwalda* 2855 (L). ?Java, *Tjiomas* 28/11/88 (L). BORNEO: *Winkler* 2197 (L). ?G. Kunepay, *Hallier* 1939 (L). ?Dversin, *Korthals* s.n. (L). Rajang, Sibu Kalong, *Haviland* 2836 (L). NORTH BORNEO: Kinabalu Mt., *Puasa* N. Borneo Forestry Dept. No. 1541 (L). Tambunan, *Wyatt-Smith* Kepongfield No. 80412 (L, US). Kampong Kinasaraban, *Sinclair* et al. 8994 (L). CELEBES: *de Vriese & Teijsmann* s.n. (L). TUKANG-BESI ISLANDS: Biriongko, *Elbert* 2588 (6083) (L). Kp. Palima, *Noerkas* 265 (L). Bonto Djai, *Rachmat* Exp. v. Vuuren 29 (L). Malili, Thawata, Boschproefstation #Cel/V-164 (L). Rante Lemo, Pare-Pare, *Kjellberg* 3827 (S), 3827a (S). Labibia, *Kjellberg* 1363 (S). Makale, *Kjellberg* 1656 (L, S). G. Bontham, *Bünnemeyer* 12354 (L). Minahassa, *Koorders* 18091 β (L), 19718 β (L); Menado, *Koorders* 18089 (L). SOUTHEAST: Landschaft Lankape, *Elbert* 7420 (3029) (L). Landschaft Rumbia, *Elbert* 7528 (3071) (L). BUTON ISLAND: Lipumangau, *Elbert* 6502 (2745) (L). Limbo, *Elbert* 6616 (2785) (L). MOENA (MUNA) ISLAND: Raha, *Elbert* 7086 (2904) (L), Boschproefstation 1 1 5848 (L). Tanette, *Bünnemeyer* 11760 (L). SW. CELEBES: KAMP: Birooro by Lombasang, *Bünnemeyer* 11646 (L), 11456 (L). LOMBOK: Rindjani-Vulkangebirge, N. side Labuan tjarik, *Elbert* 235 (535) (L). SW. LOMBOK: Plambi, *Elbert* 5763 (2411) (L). SUMBA (SOEMBA): Maomarroe, *Iboet* 486 (L), 538 (L), Loloooh, *Iboet* 278 (L). WEST SUMBA: Waikalubah, *Monad de Froidville* 1869 (L). FLORES: Endeh, *Jaag* 1806 (L). ALOR: Central highland, Lantoka-Pido, *Jaag* 1245 (L). TIMOR: A specimen ex Herb. Mus. Paris, labeled *Riedleia tiliaefolia* (US 13124). *Zippelius* s.n. (L). En Onderh. P. Alor, *Bowman-Houtman* 159 (L). *A. de Jussieu* missit 1834 (S), ?*M. umbellata* or *M. odorata*. E. TIMOR: Plateau of Baucau, *Van Steenis* 18048 (L).

PHILIPPINES: *Hallier* 347a (L). PALAWAN: Fanabay, *Manalo* 3 (Forestry Bur. #7426) (US). TAWITAWI: Sulu Prov., *Ramos & Edaño* Bur. Sci. #44111 (L). MINDANAO: ZAMBOANGA: Tetuan, *Ahern* 48 (US). DAVAO: Todaya (Mt. Apo), *Elmer* 10864 (L, US), *Clemens* Bur. Sci. #15581 (L); Santa Cruz, *Williams* 2799 (US). AGUSAN: Cabadbaran (Mt. Urdaneta), *Elmer* 13651 (L). Surigao, *Ahern* 340 (US). NEGROS: NEGROS ORIENTAL: Dumaguete (Cuernos Mts.), *Elmer* 9493 (L, US). SIARGAO: *Ramos & Pascasio*, Bur. Sci. #34853 (L). LEYTE: *Wenzel* 1352 (L). SAMAR: *Ramos* Bur. Sci. #17594 (US). CULION: *Merrill* 619 (US). MINDORO: Baco River, *McGregor* 299 (US). Calapan, *Escritor* Bur. Sci. #21269 (L, US). Mt. Yagaw, SE. slope, *Conklin* 269 (L, US). East Mindoro, 18 km. S. of Puerto Galena, San Teodoro, *Vera Santos* 5291 (L, US). LUZON: Morong, Tanay, *Merrill* 2286 (US). SORSOGON: Irosin, Mt. Bangko, *Edaño & Gutierrez* 161 (L); Mt. Bulusan, *Elmer* 16505 (L, S, US); Patag, *Sinclair & Edaño* 9613 (L). Batangas, *Ramos & Deroy* Bur. Sci. #22665 (US). LAGUNA: Los Baños, *Quisumbing* 466 (US), *Ramundo* s.n. (S); Mt. Maquiling, *Elmer* 17920 (L, S, US), *Mendoza* Phil. Nat. Herb. 12201 (US). RIZAL: *Ramos* 1086 (US); *Ahern's* Collector Forestry Bur. #3152 (US); Manila, Navaliches, *Loher* 155 (US); Montalban, *Loher* 5574 (US); Bosoboso, *Merrill* 2829 (US), 2840 (US). BATAAN: Dinalupijan, *Merrill* 1476 (US). ZAMBALES: Subig, *Hallier* 4347 (L). TAYABAS: Casiguran,

Mearns Bur. Sci. #2972 (US). BENGUET: Sablan, *Elmer* 6086 (US). CAGAYAN: Littoe, Lagum, vic. of Peñablanca, *Adduru* 161 (US), 228 (US).

MOLUCCAS: TALAUD: Karakelong, *Lam* 2570 (L). MOROTAI: *Kostermans* 1541 (L). HALMAHERA: *Idjan & Moehlar* 365 (L). Kmp. Goal., *Pleyte* 157 (L). S. peninsula, *Anang* 553 (L). TERNATE: Kabora, *Anang* 135 (L). Foramadiahi, *Beguin* 1103 (L), 1594 (L). Lagoena, *Beguin* 628 (L). Dessa Takome, *Bish.* 23 (L). East coast, *Pleyte* 82 (L). SOELA (SULA): Sanana, Tandjong Baliha, *Bloembergen* 4367 (L). Mangoli Island and N. of Mangoli, *Neth. Ind. For. Serv.* bb. 29860 (L). BURU (BOEROE): *de Vriese* Feb. 1860? (L). AMBOINA (AMBON): Poka, exp. v. Hulstyn, *Saanan* 105 (L). KAI (KEI): Ohoitiel bij Toeal, *Jensen* 312 (L). AROE (ARU): P. Trangan, KP. Ngaibor, *Buwalda* 5334 (L). TANIMBAR: *Neth. Ind. For. Serv.* bb 24350 (L). BABAR: PULAU WOTAN: E. Herloh, *van Borssum Waalkos* 3028 (L).

NEW GUINEA: Near Kp. Saban (Wentholt exp.), *Anta* 261 (L). Jappen-Biak, Mentembac, *Aet & Idjan* 104 (L). JAPEN: Seroei, *Neth. Ind. For. Serv.* bb. 30566 (L). RADJAH AMPAT: Batanta Island, W. of Sorong, Marchesa Bay, Amdoei village, *van Royen*, 3533 (L). Sorong, Misool, W. of Fakal, bank of Kasim River, *Pleyte* 1128 (L). Hollandia (Iamadi) Onderafd. Hollandia, *Kalkman* #BW3677 (L). Stephansort, (?*M. umbellata*, fruit immature), *Lewandowsky* 34 (L, S). PAPUA: *Schlechter* 16143 (L, S), isotypes of *M. odorata* var. *Schlechteri* Mildb.; Koitaki, *Carr* 12672 (L); Lake Daviumbu, Middle Fly River, *Brass* 7734 (L); Northern Dist., ca. 3 mi. from Aku on Kuruaku tract Tufi subdist., *Saunders* 30 (K, L); MILNE BAY DIST.: Cape Vogel peninsula near Tapio village, *Hoogland* 4288 (A, L).

HAWAII: OAHU: Kahuku mauka, *Lam* 7285a (L), *Degener et al.* 19548 (L, S, US).

This species can be distinguished from the other species in the section *Visenia* by its oblong fruit with intercarpellary sulci extending its entire length, large suborbicular stipules, and relatively large-winged seeds.

2. *Melochia odorata* L. f. *Supp. Plant.* 302. 1781.

A shrub or spreading, umbrella-crowned tree (1.2–) 3.3–15 meters high, 9–10 cm. in diameter, the young stems and petioles rather densely puberulous, hairs stellate and forked, 0.1–0.5 mm. long, the internodes 0.3–3.0 cm. long; stipules deciduous, 2.5–4.0 (–9.0) mm. long, 0.8–1.1 (–4.0) mm. wide, deltoid-acute or deltoid-acuminate, covered with forked, stellate, and simple hairs 0.1–0.3 mm. long; petiole 1.0–9.0 cm. long.

Lamina 4–20.7 cm. long, 2–18.7 cm. wide, usually ovate, the base rounded to cordate or truncate, the apex acute to acuminate, leaves subtending the inflorescence sometimes lanceolate-ovate, the base cuneate to rounded, and at the lower end of the range in size, both surfaces of young leaves silvery to greenish- or tan-canescant, densely puberulous, sometimes rough, hairs stellate, forked, and simple, 0.1–0.5 mm. long, soon glabrate, a few scattered hairs remaining, especially on the veins, the margin irregularly crenate-serrate, serrations 1.7–6.6 mm. wide, 0.5–2.4 mm. high, 6–10 pairs of primary veins, usually 2 (1–3) are basal.

Inflorescences usually loose, 2.5–7.0 (–14) cm. long, in axils of upper 2–4 leaves, corymbiform, the flower number moderate, the ultimate divisions umbellate, the umbels 3–5-flowered, the flowers scented, the peduncle 2.5–4.5 (–13) cm. long, with a primary branch 0.8–1 cm. long, and sometimes a secondary one 0.5–0.8 cm. long, the pedicels (1–) 2–7 mm. long; bracts 3.7–5.5 mm. long, 0.5–1.7 mm. wide, lanceolate, covered with stellate and forked hairs 0.1–0.4 mm. long.

Calyx pink or pale purple, 5.8–8.6 mm. long, 6.1–8.0 mm. wide, densely covered with forked, stellate, and simple hairs 0.1–0.5 mm. long, the teeth 3.7–5.0 mm. long, 2.5–3.0 mm. wide, deltoid or ovate, acuminate, the sinus acute; petals usually pink, rarely pale lilac, pale lilac with a proximal orange spot, cream with yellow proximally, or white, 7.8–12.5 mm. long, 3.0–4.2 mm. wide, ovobate, the claw 1.3–1.7 mm. long, attached to the stamens for 1.4–2.5 mm., undulating ring of glandular tissue 0.2 mm. wide between the calyx and corolla ascending between the petals and descending at their bases.

Longistylous form. Stamens 5–5.5 mm. long, the filaments free for 1.3–1.5 mm., the anthers 1.5–1.7 mm. long, 1.0–1.2 mm. wide, oblong, usually emarginate at both ends, usually deeply so at the apex; pistil 7.5–8.2 mm. long, the styles 4.5–5.7 mm. long, free to the ovary, papillose and clavate at the apex for 1–1.5 mm., the ovary elliptical to ovoid, densely sericeous, hairs 0.5–1.5 mm. long, the carpels sometimes 7 or 8, stipe none.

Brevistylous form. Stamens 6.5–6.8 mm. long, ?staminodes 0.1 mm. long sometimes present, the filaments free for 3.7 mm., the anthers 1.5–1.6 mm. long, 0.8–0.9 mm. wide; pistil 4.5 mm. long, the styles 2.5 mm. long, free to the ovary, the carpels sometimes 6 or 7.

Fruit ovoid, 4–6 mm. long, 4–6.5 (–8.0) mm. wide, the arista remnant of styles 0–2.0 mm. long, the sulci between the carpels shallow to fairly deep, sericeous to tomentulose, hairs 0.5–1.5 mm. long; dehiscence all along the ventral sutures and a third to half way along the dorsal sutures, very slightly septicial; seeds 1 or 2 per carpel, 1.9 mm. long, 1.1 mm. wide, red brown, wing or other projection usually absent, sometimes with a wing 0.6–2.0 mm. high, 1.0 mm. wide.

Flowering specimens collected throughout the year except in January; fruiting ones throughout the year except in January, May, September, and December.

TYPE LOCALITY: Tanna Island, New Hebrides.

DISTRIBUTION: New Guinea to New Caledonia, common in second growth rain forest, at the edge of the rain forest, along river banks, in savanna, littoral, in disturbed ground, on limestone or sandy soil, at 0–1,200 meters elevation.

NEW GUINEA: MADANG: Near Mawan village, Gogol Valley (ca. 25 km. inland), *Hoogland* 4917 (A, L, US). Yllabe by Finschhafen, *Weinland* 254 (L, US). Cycloop-gebergte. W. van Ifor orderafd. Hollandia, *Kalkman* 3504 (L). MOROBE: Lae, *Dept. Forests Native Collector* 5494 (L); Busu River near Lae, *White N.G.F.* 9550 (L); Bupu River, near Lae, *Millar N.G.F.* 9298 (L); Manum Waters on the Nadzab Road, *Womersley & Floyd* 5655 (L); Sattelberg, *Clemens* 521 (L). PAPUA: Daru Island, Western Division, *Brass* 6346 (L). Kokoda, *Carr* 16277 (L). Isuarava, *Carr* 16041 (L). Rouna, *Carr* 12405 (L). ROSSEL ISLAND: Abaleti, *Brass* 28336 (L, US); Jinju, *Brass* 28533 (L, US). MILNE BAY: Biniguni Camp, Gwariu River, *Brass* 23931 (A); Between Dabora and Wabubu, Cape Vogel Peninsula, *Brass* 21871 (A); Peria Creek, Kwagira River, *Brass*, 23995 (A).

SOLOMON ISLANDS: BOUGAINVILLE: Kieta, *Kajewski* 1539 (L); Kugimarua, Buin, *Kajewski* 1797 (L). NEW GEORGIA: *Waterhouse* 131 (K). GUADALCANAL: Nalimbu River, *F. S. Walker & White B.S.I.P.* 17 (L); Vulolo, Tutuve Mt., *Kajewski* 2539 (L); Neighborhood of Tenawe River and the sea, *Riley* 9 (US). SAN CRISTÓBAL: Waimamura, *Brass* 2681 (L).

NEW HEBRIDES: SANTA CRUZ ISLANDS: Vanikoro Island, *Kajewski* 555 (A, UC, US). Tanna and Nova Amsterdam, *Forster* in 1779 (S, W). ANEITYUM: Collector not mentioned, 61 (S); Anelgauhat Bay, *Kajewski* 713 (US).

LOYALTY ISLANDS: *Franc* 1093 (UC).

NEW CALEDONIA: *Prony* 1822 A (UC). *Deplanche* 155 (L). Slope of Ouen Toro, *McKee* 2247 (L, US). Chepenehe, *McKee* 5257 (L). Auf den Bergen bei Paita, 10 mi. from Nouméa, *Schlechter* 14978 (L). Near native village of Tribu Katricoin along trail northward from waterfall at fork of Bogen River and Table Unio, *Buchholz* 1289 (US).

This species is close to *M. vitiensis* and *M. aristata*. The seeds of *M. odorata* are usually wingless, those of *M. vitiensis* are winged, and those of *M. aristata* are usually aristate. The young leaves of *M. odorata* are sometimes quite hairy, those of *M. vitiensis* and *M. aristata* are soon glabrate. The calyx and bracts of *M. odorata* are longer than those of *M. aristata* and *M. vitiensis*.

3. *Melochia vitiensis* A. Gray, Bot. U.S. Expl. Exped. 1:193. 1854.

A shrub to spreading tree 1.5–12 meters high, the young stems fuscous-tomentulose, hairs stellate, a few forked, 0.1–0.3 mm. long, the internodes 0.5–14.0 cm. long; stipules deciduous, 2.4–7.0 mm. long, 0.9–2.0 mm. wide, deltoid-acute to deltoid-acuminate, tomentulose, hairs stellate and forked, 0.1–0.4 mm. long; petiole 2–9.5 cm. long, indument similar to that on young stems but tending to occur on one side.

Lamina 6–17 cm. long, 3.3–12.0 cm. wide, broadly ovate, the base cordate, sometimes rounded to subtruncate in those subtending the inflorescence, the apex acute to acuminate, young leaves sericeous-tomentulose on both surfaces, hairs forked, simple, and stellate, older leaves subglabrate, with few, mostly stellate hairs 0.1–0.6 mm. long on the veins, the margin irregularly crenate-serrate, serrations 1.2–5.0 mm. wide, 0.3–2.5 mm. high, 7–10 pairs of primary veins, 2 or 3 are basal.

Inflorescences fairly loose, in axils of 1–4 upper leaves, 6–12.7 cm. long, corymbiform, the flower number moderate, the ultimate divisions umbellate, the umbels 2- or 3-flowered, the peduncle 6–9.5 cm. long, with a primary branch 0.8–3.8 cm. long, a secondary one 0.7–1.4 cm. long, and sometimes a tertiary one 1 cm. long, the pedicels 2.5–7.0 mm. long; bracts soon deciduous, 1.0–2.1 mm. long, 0.4–0.8 mm. wide, nearly linear to lanceolate and ovate, acute, densely tomentulose, hairs stellate, 0.1–0.2 mm. long.

Calyx 3.5–6.0 mm. long, 3.8–6.7 mm. wide, densely tomentulose, hairs stellate, 0.1–0.4 mm. long, the teeth 1.7–3.0 mm. long, 1.7–2.7 mm. wide, deltoid or ovate, acute, the sinus acute to narrowly rounded; petals pale yellow or white, 5.0–7.6 mm. long, 1.7–2.8 mm. wide, oval, elliptic, ovate or oblong, attached to the stamens for 1.5–2.0 mm., the claw 1–2 mm. long.

Longistylous form. Stamens 4.0–5.2 mm. long, the filaments united up to the anthers, the anthers bright yellow, 1.5–2.2 mm. long, 0.7–1.4 mm. wide, oblong, emarginate usually nearly to the middle from both ends; pistil 7.2 mm. long, the styles free for 3.5–4.5 mm., united for 1 mm., sparsely sericeous, hairs 0.3–0.7 mm. long, filiform, sometimes clavate, papillose for 0.6–1.0 mm., the ovary oblong, densely sericeous, hairs 0.7–1.4 mm. long, the carpels sometimes 6.

Brevistylous form. Stamens 4.7 mm. long, the filaments free for 1.8 mm., the anthers 2.0 mm. long, 0.9 mm. wide; pistil 4.3 mm. long, the styles free for 2.0 mm., united for 1 mm., filiform, the ovary globular, densely sericeous, hairs 1 mm. long.

Fruit 7.0–9.0 mm. long, 7.0–7.5 mm. wide, the arista 1–1.5 mm. long, globular-ovoid, pentagonal, the dorsum of carpels obtuse-angled, the sulci between the carpels extending a fourth to a third the way to the center of the distal half of the fruit, fuscous-sericeous-tomentose, hairs stellate (short), forked, and simple, 0.1–1.5 mm. long, the stipe 0–0.5 mm. long; dehiscence all along the ventral sutures and a third to half way along the dorsal sutures; seeds 1 or 2 per cell, winged, the body brown, 2.1–2.8 mm. long, 1.3–1.6 mm. wide, the wing extending 1.3–2.0 mm. beyond the body, 1.3–1.7 mm. wide, the adaxial edge straight, the abaxial edge convex, the apex rounded or acute.

Flowering specimens collected in March, July, October, and November; budding ones in May; fruiting ones in October and November.

TYPE LOCALITY: Fiji Islands: Vanua-levu, Somu-somu (on Taveuni), Ovalau, Oneata (Lau, eastern group).

DISTRIBUTION: Fiji Islands, in thin forest, thickets, clearings, grass-covered "forehills," on rocky limestone slopes and on low ground inside the sandy beach, at 0–500 meters elevation.

FIJI ISLANDS: U.S. South Pacific Exploring Exped. under Capt. Wilkes (GH, US 13128 lectotype). *Seemann* 37 (GH). VANUA LEVU: MATHUATA: S. slopes of Mt. Numbuiloa, E. of Lambasa, *A. C. Smith* 6549 (A, L, S, US). Lower Wainunu River valley, Mbua, *A. C. Smith* 1727 (GH, S. US). THAKAUNDOVE: Nakawanga, *Gressitt* 2487 (US). TAVEUNI: Vicinity of Waiyur, *Gillespie* 4701 (GH). KAMBARA (Lau group): *A. C. Smith* 1301 (GH, S, US). MATUKU: *Bryan* 259 (GH).

This species is closest to *M. odorata* and *M. aristata*. It is distinguished from them under the description of *M. odorata*. In addition, the leaf of *M. vitiensis* is usually broader and more frequently cordate at the base than that of *M. aristata*.

4. *Melochia longepetiolata* A. C. Sm. Journ. Arn. Arb. 31:310. 1950.

A tree 4–8 meters high, the young stems minutely tomentulose, hairs tan, stellate, 0.05–0.1 mm. long, the internodes 1–18.5 cm. long; stipules 3–5 mm. long, 0.8–2.0 mm. wide, deltoid-acute, minutely tomentulose, hairs stellate, 0.05–0.1 mm. long; petiole usually long, 2–19 cm. long, indument similar to that on young stems, a few hairs to 0.2 mm. long.

Lamina 6.2–24 cm. long, 3–21.5 cm. wide, usually broadly ovate, the base cordate, truncate or rounded, the apex acute, the upper surface glabrous, the lower surface subglabrous, hairs scattered, stellate, 0.1–0.2 (–0.4) mm. long on veins and in their axils, stellate hairs on the interstices 0.05 mm. long, the margin irregularly crenate to crenate-serrate, crenations or serrations 2.5–7.0 mm. wide, 0.5–1.9 mm. high, 6–10 pairs of primary veins, 2 or 3 are basal.

Inflorescences 17.5–21.5 cm. long, loose, in the axil of the uppermost leaf, sometimes not associated with a leaf or 90° from a leaf axil, at 1–2 nodes, few-flowered, corymbiform, the ultimate divisions umbellate, the umbels 2- or 3-flowered, the peduncle 7.5–11 cm. long, with a primary branch 3.5–5.2 (–7.0) cm. long, a secondary one 1–1.7 (–2.5) cm. long, and sometimes a tertiary one to 0.8 cm. long, the pedicels 5–7 mm. long; bracts deciduous, all fallen off.

Calyx 6–8.2 mm. long, 7.2–10.0 mm. wide, densely tomentulose, hairs stellate and forked, 0.05–0.2 mm. long, the teeth 4–5.5 mm. long, 3–4.8 mm. wide, ovate, acute, the sinus acute; petals salmon pink, 7.3–10.1 mm. long, 2–2.8 mm. wide, oblanceolate or obovate-elliptic, attached to the stamens for 1–2 mm., the claw 1–2.5 mm. long.

Longistylous form not seen.

Brevistylous form. Stamens 6.6–7.7 mm. long, the filaments free for 3.5–4.4 mm., the anthers 1.4–1.7 mm. long, 0.7–1.0 mm. wide, oblong, emarginate at both ends, staminodes sometimes present, 0.2 mm. long; pistil 7.2–7.5 mm. long (somewhat developed), the styles filiform, free for 2.6 mm., united for 1 mm., the base tomentose, the ovary globular, densely tomentose-sericeous, hairs 1.5 mm. long.

Fruit 8–9 mm. long, 7.5–8.0 mm. wide, the arista 1–1.5 mm. long, ovate, globular, obtuse-angled, the sulci between the carpels shallow, deepest distally, extending one-fifth of way to the center of the fruit, tomentose, hairs simple, forked, and stellate, 1–1.6 mm. long, also stellate 0.1 mm. long, the carpels sometimes 6–7, stipe none; dehiscence all along the ventral sutures and one-fifth along the dorsal sutures; seeds brown, winged, the body 2.6–2.8 mm. long, 1.6–1.7 mm. wide, the wing 2.5–3.0 mm. high, 1.1–2.0 mm. wide, the adaxial edge straight, the abaxial edge convex.

Flowering and fruiting specimens⁷ collected in October.

TYPE LOCALITY: Kandavu, Fiji Islands, type cited below.

DISTRIBUTION: Kandavu, Fiji Islands, in dense forest, or among reeds, at 200–500 meters elevation.

FIJI ISLANDS: KANDAVU: Mt. Mbuke Levu, *A. C. Smith* 218 (S, US, type). Hills above Namalata and Ngaloa Bays, *A. C. Smith* 110 (S, US).

This species can be distinguished from the other species with subglabrous leaves in the section *Visenia* by its long inflorescences, long peduncles, long petioles, and relatively large calyxes. Its salmon pink petals are also an aid to identification.

5. *Melochia aristata* A. Gray, Bot. U.S. Expl. Exped. 1:193. 1854.

A small tree 1.5–6.0 meters high, about 12 cm. in diameter, the young stems and petioles fuscous-tomentulose, hairs stellate, 0.1–0.2 mm. long, the internodes 0.7–8.3 cm. long; stipules soon deciduous, 2.4–4.0 mm. long, 0.8–1.5 mm. wide, deltoid or ovate, acute, densely hirsute-tomentulose, hairs fuscous, stellate and forked, 0.1–0.2 mm. long; petiole slender, 2–6 cm. long.

Lamina 5.5–12.0 (–15) cm. long, 2.0–8.9 (–12.4) cm. wide, broadly ovate, to lanceolate in leaf subtending the inflorescence, the base rounded, broadly subcordate, cordate, or nearly truncate, the apex acute or acuminate, the upper surface tomentulose, velvety to the touch, mostly stellate, to glabrate with hairs scattered, stellate, forked, and simple, 0.1–0.2 mm. long, the lower surface subglabrous with scattered stellate, forked, and simple hairs 0.1–0.4 mm. long, mostly on the veins, the margin irregularly crenate-serrate, serrations 1.3–5.6 mm. wide, 0.3–1.5 mm. high, 7–9 pairs of primary veins, 1–3 are basal.

Inflorescences 5–12 cm. long, fairly loose, the flower number moderate, in axils of 1–4 upper leaves, corymbiform, the ultimate divisions umbellate, the umbels 2–4-flowered, the peduncle 2.5–5.2 (–7.0) cm. long, with a primary branch 0.6–2.2 cm. long, a secondary one 0.5–0.8 (–2.2) cm. long, and sometimes a tertiary one 0.5 cm. long, the pedicels 1.5–3.0 mm. long in flower to 7.7 mm. in fruit; bracts soon deciduous, 2 mm. long, 0.5–1.5 mm. wide, ovate or lanceolate, acute, densely tomentulose, hairs stellate, 0.1–0.2 mm. long.

Calyx 4.0–5.5 mm. long, 4.1–6.5 mm. wide, tomentulose, hairs stellate, simple, a few forked, 0.1–0.4 mm. long, the teeth 1.6–3.0 mm. long 1.3–2.5 mm. wide, deltoid to ovate, acute, the sinus acute to narrowly rounded; petals red, pink, or white proximally and shading to rose distally, 7.8–9.0 mm. long, 2.0–3.6 mm. wide, obovate, oblanceolate, or elliptic, attached to the stamens for 2–2.8 mm., the claw 1–2.8 mm. long.

Longistylous form. Stamens 5.0 mm. long, the filaments free for 1.2–1.4 mm., the anthers 1.5–1.7 mm. long, 0.9–1.1 mm. wide, oblong, emarginate at both ends; pistil 8.2 mm. long, the styles slightly clavate, papillose for 0.8 mm., 5.0 mm. long, free to the ovary, the ovary ovoid, densely sericeous, hairs 0.6–1.0 mm. long.

Brevistylous form. Stamens 6.2–7.0 mm. long, the filaments free for 4.0 mm., the anthers 1.4–1.7 mm. long, 0.8–1.1 mm. wide; pistil 5.0 mm. long (slightly developed), the styles filiform, 2.6 mm. long, free to the ovary, the ovary globular-ovoid, sericeous-tomentose, hairs 0.7–1.1 mm. long.

Fruit 6.2–10.5 mm. long, of which the arista is 1–2 mm. long, 5.2–6.7 mm. wide, globular-ovoid, pentagonal, the dorsum of carpels obtuse-angled, the sulci between the carpels shallow, in the distal half of the fruit, extending a fifth to a fourth the way to its center, tomentose, hairs stellate (short), simple, and forked, 0.1–1.3 mm. long, the stipe 0–1.0 mm. long (base of capsule); dehiscence all along the ventral sutures and a third to half way along the dorsal sutures, slightly septicial; seeds 1 or 2 per cell, wingless to slightly winged, the body 1.8–3.3 mm. long, 1.5–1.9 mm. wide, trigonal, brown, sometimes with an arista 0.7 mm. long, testa loosened for 0.2–0.5 mm., or with a wing 0.3 mm. high, 0.7 mm. wide.

Flowering specimens collected in March, May, July to September, and November; fruiting ones in March, May, and July to September.

TYPE LOCALITY: Upolu, Samoa, type cited below.

DISTRIBUTION: Samoa, Tonga, and Tuamotu Islands, in rain forest, thickets, in coral sand, at 0–650 meters elevation.

TONGA: VAVA'U ISLAND: Near Ngofe swamp, SW. side of the island, *Yuncker* 16029 (US). Vava'u and Lifuka, *Harvey* August and October 1855 (GH).

SAMOA: SAVAI: Safunc, *Bryan* 140 (A). Vaipouli, *Vaupel* 360 (US). Near Fagalele, *Christophersen* 3403 (L). UPOLU: U.S. S. Pac. Exped. under Capt. Wilkes (GH, US, type). *K. & L. Reehinger* 1443 (US). Falefa, *Hochreutiner* 3449 (L). Ridge above Malololelei, *Christophersen* 164 (US). Id. Singamana, near Apia, *Hochreutiner* 3222 (L). TUTUILA: *Setchell* 512 (US).

TUAMOTU: MAKATEA: *Wilder* 1149 (A).

This species is close to *M. odorata* and *M. vitiensis*. It is distinguished from them under the description of *M. odorata*. In addition, the serrations of the leaves of *M. aristata* are generally shorter than those of the other two species.

6. *Melochia degeneriana* A. C. Sm. Journ. Arn. Arb. 31:307. 1950.

A slender tree 2–15 meters high, the young stems tomentulose or with scattered stellate and forked hairs 0.05–0.2 mm. long, the internodes 0.5–5.0 cm. long; stipules soon deciduous, 3.0–5.3 mm. long, 0.5–1.0 mm. wide, lanceolate, tomentulose to subglabrous, hairs stellate, 0.1–0.5 mm. long; petiole 0.3–3.0 cm. long, adaxial surface tomentulose, hairs stellate, 0.1–0.3 mm. long.

Lamina thin, 4–11.5 cm. long, 1.8–5.7 (–6.5) cm. wide, usually ovate, sometimes lanceolate-ovate, the base broadly rounded, rarely also narrowly rounded, the apex acute, both surfaces subglabrous, few scattered stellate, simple, and forked hairs 0.1–0.5 mm. long on the veins and sometimes also on the interstices, the margin irregularly and shallowly crenate-serrate, serrations distant, 1.3–8.3 mm. wide, low, 0.3–1.1 mm. high, 6–10 pairs of primary veins, 1 or 2 are basal, the second much stronger than the first.

Inflorescences fairly loose, the flower number moderate, sometimes few, in the axils of the upper 4 leaves, sometimes apparently terminal, or leaf-opposed, 6–14 cm. long, corymbiform, the ultimate divisions umbellate, the umbels 2–4-flowered, the peduncle 2.5–4.5 (–6.0) cm. long, with a primary branch 0.5–1.5 cm. long, a secondary one 0.3–0.5 cm. long, and sometimes a tertiary one to 0.5 cm. long, the pedicels 2.0–6.0 mm. long, densely tomentulose, hairs stellate, 0.1 mm. long and glandular, 0.2 mm. long; bracts soon deciduous, 1.1–1.6 mm. long, 0.4 mm. wide, lanceolate, tomentulose, hairs simple, forked, and stellate, 0.1 mm. long.

Calyx brownish pink 4.1–6.0 mm. long, 5.1–6.6 mm. wide, tomentulose, hairs stellate, 0.05–0.2 mm. long, sometimes also glandular, 0.2 mm. long, the teeth 1.2–3.1 mm. long, 1.6–3.1 mm. wide, deltoid, acute, the sinus acute to slightly rounded; petals pale yellow, 6.0–9.1 mm. long, 2.7–3.1 mm. wide, elliptic to obovate, attached to the stamens for 1.0–2.5 mm., the claw 1.0–2.5 mm. long.

Longistylous form. Stamens 5.2–5.5 mm. long, the filaments united up to the anthers, the anthers 1.8–2.0 mm. long, 0.9–1.4 mm. wide, oblong, emarginate at both ends, nearly to the middle from the apex; pistil 7.6 mm. long, the styles filiform, papillose for 1.5 mm., free for 5.0 mm., united for 1.0 mm., the ovary ovoid densely sericeous, hairs 0.7–1.0 mm. long, stipe none.

Brevistylous form. Stamens 5.5–7.0 mm. long, the filaments pale yellow, free for 2.5–3.5 mm., the anthers 2.1–2.5 mm. long, 1.3–1.4 mm. wide; pistil 4.0 mm. long, the styles 1.4–1.6 mm. long, free to the ovary, papillose for 0.8 mm., the ovary globular, densely tomentose-sericeous, hairs 1.0–1.2 mm. long, the carpels sometimes 6 or 7.

Fruit tough, 9–10 mm. long, of which the arista is 1.5 mm. long, 6–7.2 mm. wide, globular-ovoid, the dorsum of carpels obtuse-angled, the sulci between the carpels extending a fourth to half way to the center of the distal half, tomentose when young, hairs simple and forked, 0.3–1.2 mm. long, and stellate, 0.1 mm. long, stipe none; dehiscence all along the ventral sutures and a third along the dorsal sutures; seeds (immature) brown, winged, the body 2.3 mm. long, 1.3 mm. wide, the wing 1.3–3.0 high, 0.7–1.9 mm. wide.

Flowering specimens collected in January, May to September, and December; fruiting ones January to March, May to September, and December.

TYPE LOCALITY: Viti Levu, Fiji Islands, type cited below.

DISTRIBUTION: Viti Levu, Fiji Islands, in forest, often on dry crests, at 0–1,150 meters elevation.

FIJI ISLANDS: VITI LEVU: *Greenwood* 742 (K). MBA (formerly Tholo North): Western and southern slopes of Mt. Tomanivi (Mt. Victoria), *A. C. Smith* 5095 (L, US, type). THOLO NORTH: VIC. OF NANDARIVATU: Nauwanga, *Degener* 15399 (US). LAUTOKA: N. of Lomolomo, *Degener & Ordonez* 13643 (S, US). NANDRONGA AND NAVOSA (formerly [Tholo] West): Southern slopes of Nausori Highlands, *A. C. Smith* 4585 (L, S, US). Naduruloulou Agr. Exp. Garden, *Lam* 6933 (L). Namosi, *Gillespie* 2825 (US). Leviti Creek, Suva, *Mrs. Parham* 21 (A).

This species is closest to *M. mollipila*. The differences are given under the description of the latter species.

7. *Melochia mollipila* A. C. Sm. Journ. Arn. Arb. 31:308. 1950.

A branched shrub or small tree 3–7 meters high, the young stems densely fuscous-canescens, tomentulose, hairs stellate, 0.05–0.2 mm. long, the internodes 0.5–6.0 cm. long; stipules soon deciduous, 3.2–5.0 mm. long, 0.9–1.2 mm. wide, deltoid, acute, tomentulose, hairs stellate, 0.1–0.2 mm. long; petiole 0.5–6.0 cm. long, indument similar to that on young stems but hairs to 0.5 mm. long, average 0.2 mm.

Lamina 3.5–13.0 cm. long, 1.8–11.5 cm. wide, the small leaves being close to the inflorescence, usually broadly ovate, the base rounded to subcordate, rarely cuneate or subtruncate, the apex acute, the upper surface subglabrous, hairs few, scattered, stellate and forked, 0.1–0.2 mm. long, the lower surface slightly canescent, velvety to the touch, tomentulose, hairs stellate, 0.1–0.4 (most 0.2) mm. long, the margin irregularly and shallowly crenate or crenate-serrate, crenations or serrations 2–7 mm. wide, 0.3–0.8 mm. high, 8 or 9 pairs of primary veins, 2 are basal.

Inflorescences compact to fairly loose, the flower number few to moderate, in the axils of the upper 2 or 3 leaves and 3–9.5 cm. long, sometimes also terminal and 3.5 cm. long, corymbiform, the ultimate divisions umbellate, the umbels 2- or 3-flowered, the peduncle 2–4

(-5.5) cm. long, with a primary branch 0.4–1.4 cm. long and a secondary one 0.4–0.6 cm. long, the pedicels 1–3 mm. long in flower, to 5 mm. long in fruit; bracts soon deciduous, 2–3 mm. long, 0.7–1.0 mm. wide, deltoid, acute, tomentulose, hairs stellate, 0.1–0.2 mm. long.

Calyx pink, thick, 5.1–5.8 mm. long, 5.3–7.3 mm. wide, densely tomentulose, hairs stellate, fewer forked, 0.1–0.3 mm. long, the teeth 2.6–3.0 mm. long, 2.5–3.3 mm. wide, deltoid to ovate, acute, the sinus acute to somewhat rounded; petals pale yellow, 6.7–8.3 mm. long, 2.0–3.2 mm. wide, elliptic to oval, attached to the stamens for 0.8–1.5 mm., the claw 1–1.5 mm. long.

Longistylous form. Stamens pale yellow, 4.3–5.0 mm. long, the filaments united up to the anthers or free for 0.5 mm., the anthers 1.4–1.9 mm. long, 1.2–1.3 mm. wide, oblong, emarginate at both ends, sometimes fairly deeply so; pistil 6.3–6.7 mm. long, the styles filiform, papillose for 1 mm., free to the ovary, 3.5–4.0 mm. long, the ovary globular-ovoid, the ovary and base of styles sericeous-tomentose, hairs 0.5–1.2 mm. long, carpels sometimes 7–8, stipe none.

Brevistylous form. Stamens 6.2 mm. long, the filaments free for 4.0 mm., the anthers 1.6–1.7 mm. long, 1.0 mm. wide; pistil 4.5 mm. long, the styles 2.0 mm. long, filiform, free to the ovary, the ovary ovoid-globular, densely sericeous, hairs 0.7 mm. long, the carpels sometimes 6–8.

Fruit globular-ovoid, 5–7.5 mm. long, 5.3–9.4 mm. wide, the arista soft, 0.7 mm. long., the dorsum of carpels obtuse-angled, the sulci between the carpels deepest near the apex, where they extend a third to half way to the center of the fruit, sericeous-tomentose, canescent, hairs simple and forked, 0.5–1.2 mm. long, stellate 0.2 mm. long, the stipe 0–1.0 mm. long; dehiscence all along the ventral sutures and one-fourth the way along the dorsal sutures, also partly septicial; seeds winged, the body 2–2.5 mm. long, 1.4–1.5 mm. wide, the wing 2.6–3.5 mm. high, extending 1.8 mm. beyond the body, 1.7–2.2 mm. wide just above the body, adaxial edge straight, abaxial edge convex.

Flowering specimens collected August to October; fruiting ones in September and October.

TYPE LOCALITY: Viti Levu, Fiji Islands, type cited below.

DISTRIBUTION: Viti Levu, Fiji Islands, in hillside and grassland thickets, usually in the sun, at 550–800 meters elevation.

FIJI ISLANDS: VITI LEVU: MBA (formerly Tholo North): Slopes of the escarpment N. of Nandarivatu, *A. C. Smith* 6040 (L, US, type). NANDRONGA AND NAVOSA: N. portion of Rairaimatuka Plateau, *A. C. Smith* 5588 (L, S, US). Mt. Evans Range, *Greenwood* 1229 (US), 1239 (US).

This species is closest to *M. degeneriana*. The lower surface of the leaf of the latter is subglabrous, that of *M. mollipila* is persistently

tomentulose. The capsule of *M. mollipila* is shorter than that of *M. degeneriana*, and broader than long; capsule of *M. degeneriana* is longer than broad.

8. *Melochia roseiflora* A. C. Sm. Journ. Arn. Arb. 31:331. 1950.

A shrub or tree 1–8 meters high, the young stems and petioles tomentulose, hairs brownish, stellate, 0.05–0.5 mm. long, average 0.2 mm., the internodes 0.3–7.0 cm. long; stipules 2.5–5.5 mm. long, 1.0–1.5 mm. wide, deltoid, acute, the abaxial surface tomentulose-hirsute, hairs stellate, 0.1–0.3 mm. long; petiole short, 0.3–1.5 cm. long.

Lamina 3.7–9.0 cm. long, 2.2–6.2 cm. wide, broadly ovate to lanceolate-ovate, the base usually rounded, sometimes cuneate, the apex acute to somewhat rounded, the upper surface somewhat shiny and rather dark green, subglabrous, hairs on the veins few, scattered, stellate, 0.1–0.2 mm. long, the lower surface lighter green, hairs on the veins scattered, stellate, 0.1–0.4 mm. long, the margin irregularly and rather shallowly crenate or crenate-serrate, crenations or serrations 1.2–5.5 mm. wide, 0.3–1.0 mm. high, 6–8 pairs of primary veins, 1 or 2 are basal, the second much stronger than the first.

Inflorescences fairly compact, 4–6.5 cm. long, in the axils of the upper 2 or 3 leaves, corymbiform, the flowers few to moderate in number, the ultimate divisions umbellate, the umbels 2- or 3-flowered, the peduncle 2.3–3.2 cm. long, with a primary branch 0.6–1.4 cm. long, and sometimes a secondary one to 0.5 cm. long, the pedicels deep pink, 1.5–3.0 mm. long in flower, to 5 mm. long in fruit; bracts 1.0–3.1 mm. long, 0.5–0.7 mm. wide, deltoid to lanceolate, acute, tomentulose-hirsute, hairs stellate, 0.1–0.2 mm. long.

Calyx deep pink, 4.5–5.0 mm. long, 6.0–6.5 mm. wide, tomentulose, hairs stellate, 0.05–0.2 mm. long, also a few glandular, 0.1–0.4 mm. long on the young calyx, the teeth 2.2–2.5 mm. long, 2.5–2.8 mm. wide, deltoid, acute to acuminate, the sides rounded, the sinus acute; petals bright pink, slightly paler than the calyx, 6.5–7.9 mm. long, 2.2–2.9 mm. wide, elliptic to slightly obovate, attached to the stamens for 1.5–1.7 mm., the claw 1.5–2.0 mm. long.

Longistylous form. Stamens 4.7–5.0 mm. long, the filaments free for 0.5 mm., the anthers yellow, 1.5–2.0 mm. long, 1.1–1.3 mm. wide, oblong, emarginate nearly to the middle from both ends; pistil 7.8–8.3 mm. long, the styles rich pink, filiform, papillose for 1–1.2 mm., free for 5.0–5.2 mm., united for 0.5–0.7 mm., proximal half tomentose, the ovary globular-ovoid to elliptic, densely tomentose, hairs 0.7–1.0 mm. long, the carpels sometimes 6, stipe none.

Brevistylous form. Stamens 8.1 mm. long, the filaments nearly white, free for 4.5 mm., the anthers 1.7–1.8 mm. long, 0.7–0.9 mm. wide;

pistil 4.8 mm. long, the styles recurved, 2 mm. long, filiform, free to the ovary, the ovary ovoid, densely sericeous, hairs 1 mm. long, the carpels sometimes 7.

Fruit 7.0–7.7 mm. long, of which the arista is 0.5 mm. long, 6.0–6.3 mm. wide, globular-ovoid, the dorsum of carpels obtuse-angled, the sulci between the carpels shallow, except in the distal half, where they extend a third of way to the center of the fruit, tomentose, hairs simple, forked and stellate, 0.3–1.2 mm. long, the stellate ones also 0.1 mm. long, stipe none; dehiscence all along the ventral sutures and a fourth to half way along the dorsal sutures, also partly septicial; seeds brown, winged, the body 2.0–2.5 mm. long, 1.3–1.7 mm. wide, the wing 1.3–1.7 mm. high, 1.0–1.5 mm. wide, obliquely deltoid, apex acute or rounded.

Flowering specimens collected in April and May; fruiting ones in May.

TYPE LOCALITY: Viti Levu, Fiji Islands, isotypes cited below.

DISTRIBUTION: Viti Levu, Fiji Islands, in grassland-forest transition and in dense ridge forest and thickets, at 700–1,195 meters elevation.

FIJI ISLANDS: VITI LEVU: MBA: Northern portion of Mt. Evans Range, between Mt. Vatuyanitu and Mt. Natondra, *A. C. Smith* 4361 (L, US, isotypes). Summit of Mt. Koroyanitu, high point of Mt. Evans Range, *A. C. Smith* 4236 (L, S, US). Mt. Evans, *Greenwood* 316 (K).

This species appears to be closest to *M. degeneriana* and *M. mollipila*. The latter two have yellow flowers, those of *M. roseiflora* are bright pink. The petioles of *M. roseiflora* are usually shorter.

9. *Melochia grayana* A. C. Sm. Journ. Arn. Arb. 31:309. 1950.

Melochia vitiensis var. β A. Gray, Bot. U.S. Expl. Exped. 1:193. 1854.

A branched shrub 1.5–2 meters high, the young stems and petioles minutely tomentulose and cinereous or hairs scattered, stellate, forked, and simple, 0.05–0.3 mm. long, the internodes 0.2–3.2 cm. long; stipules 3.6–6.0 mm. long, 0.9–1.6 mm. wide, deltoid to lanceolate, acute to acuminate, subglabrous or ciliate, hairs few, simple, 0.1–0.3 mm. long; petiole 0.5–2.4 cm. long.

Lamina subcoriaceous, 3.1–7.3 (–9.0) cm. long, 1.1–2.4 (–4.5) cm. wide, lanceolate to elliptic, the base cuneate to narrowly rounded, the apex acute, the upper surface glabrous, the lower surface with few, scattered, simple, forked and stellate hairs 0.1–0.3 mm. long on the veins, the margin irregularly and shallowly serrate to crenate-serrate, serrations 1.3–5.7 mm. wide, 0.4–1.2 mm. high, 5–8 pairs of primary veins, 1 is basal.

Inflorescences loose, 5–10.5 cm. long, in axils of upper 3–5 leaves, corymbiform to subpaniculate, the flower number usually few, sometimes moderate, the ultimate divisions umbellate, the umbels 2–4-flowered, the peduncle 2–3.5 cm. long, with a primary branch 0.7–2.4

cm. long, sometimes a secondary one to 1.0 cm. long and a tertiary one to 1.6 cm. long, the pedicels 1–3.5 mm. long; bracts soon deciduous, 1.2–2.0 mm. long, 0.1–0.8 mm. wide, lanceolate to linear, tomentulose and ciliate, hairs stellate and forked, 0.1–0.2 mm. long.

Calyx orange-tinged to bright red, 5.5–6.7 mm. long, 4.0–5.5 mm. wide, tomentulose, hairs stellate and forked, usually 0.05–0.2, rarely to 0.5 mm. long, the teeth 2.2–3.2 mm. long, 1.5–2.5 mm. wide, deltoid, acute to acuminate, the sinus acute; petals yellow, 5–9 mm. long, 1.6–3.0 mm. wide, elliptic, suboval or oblong, the apex rounded, the base acute, attached to the stamens for 2.6–3.0 mm., the claw 1–2 mm. long.

Longistylous form. Stamens yellow, 4.5–5.2 mm. long, the filaments free for 1–2 mm., the anthers 1.7 mm. long, 1.1–1.2 mm. wide, oblong, deeply emarginate at both ends, sacs separate at the apex, pistil 5.7–7.1 mm. long, the styles slightly clavate, papillose for 0.8–1.0 mm., 2.9–4.5 mm. long, free to the ovary, the ovary narrowly ovoid, densely tomentose-sericeous, the carpels sometimes 7–8, stipe none.

Brevistylous form not seen.

Fruit. Only parasitized fruit seen.

Flowering specimens collected in October and November; fruiting ones in October.

TYPE LOCALITY: Vanua Levu, Fiji Islands, isotype cited below.

DISTRIBUTION: Vanua Levu, Fiji Islands, in forest, at 60–590 meters elevation.

FIJI ISLANDS: *Horne* 635 (GH) ?*M. grayana*, early bud stage. VANUA LEVU: MATHUATA: Summit ridge of Mt. Numbuiloa, E. of Lambasa, *A. C. Smith* 6525 (US, isotype). Muthuata, U.S. Expl. Exped. under Capt. Wilkes (US 13126, type of *M. vitiensis* var. β). Labasa, Macuata Coast, *Greenwood* 620A (K). Mt. Labasa, *Greenwood* 620 (K).

This species can be distinguished from the other species in the section *Visenia* by its lanceolate or elliptic leaves; the other species have at least some ovate leaves, and they are usually considerably broader.

10. *Melochia compacta* Hochr. Ann. Conserv. Jard. Bot. Genève 21:429. 1920.

A shrub or small tree 1–6 meters high, the young stems and petioles tomentulose, hairs tan, stellate, and usually also forked and simple, 0.1–0.6 mm. long, the internodes 0.5–1.0 (–4.5) cm. long; stipules 3.3–8.0 (–9.0) mm. long, 1.7–4.1 (–5.0) mm. wide, lanceolate to ovate, acuminate, hirsute or tomentulose, hairs forked and simple, 0.1–0.5 mm. long; petiole 1–6.5 (–13) cm. long.

Lamina 6.2–16 (–28) cm. long, 4.8–12.5 (–24) cm. wide, ovate, the base rounded to cordate, the apex acute, often densely tan-canescant when young, both surfaces of older leaves glabrescent, hairs scattered,

stellate and usually also forked and simple, 0.1–1.0 mm. long, the margin irregularly crenate-serrate, serrations 0.9–8.0 mm. wide, 0.3–1.7 mm. high, 8–10 pairs of primary veins, 2 or 3 are basal.

Inflorescences 3.5–20 cm. long, usually compact, flower number moderate to fairly abundant, in the axils of the upper 3–5 leaves, corymbiform, the ultimate divisions umbellate, the umbels about 5-flowered, the peduncle 2–16 cm. long, with a usually short primary branch 0.5–4.0 cm. long, sometimes a secondary one 0.3–1.5 cm. long, and a tertiary one 0.5–1.0 cm. long, the pedicels short, 0–3 mm. long; bracts rather broad, sometimes 2 united, 2–4.5 mm. long, 0.8–3.0 mm. wide, ovate to lanceolate, tomentulose or hirsute and ciliate, hairs simple, forked, and stellate, 0.1–0.9 mm. long.

Calyx 6–9 mm. long, 5.3–8.0 mm. wide, tomentulose and sericeous, hairs stellate and forked, 0.1–1.0 mm. long, the teeth 2.3–5.4 mm. long, 2–4 mm. wide, deltoid to ovate, acuminate or acute, the sinus acute; petals pink, red proximally and pink or white distally, rarely rose and yellow, or white, 6.3–15.5 mm. long, 2.3–7.5 mm. wide, obovate-cuneate, attached to the stamens for 1–2.5 mm., the claw 1.5–3.0 mm. long.

Longistylous form. Stamens 5–6 mm. long, the filaments united up to the anthers or free for 0.5 mm., the anthers 1.2–1.9 mm. long, 0.6–1.2 mm. wide, oblong, emarginate at both ends; pistil 5.2–9.0 mm. long, the styles filiform, slightly clavate, papillose for 0.8–2.0 mm., free for 2.9–6.0 mm., to the ovary, or united for 0.5 mm., the ovary ovoid or elliptical, densely sericeous, hairs simple and forked, 0.5–1.5 mm. long, stipe none.

Brevistylous form. Stamens 6.2 mm. long, the filaments free for 2–3 mm., the anthers 1.2–1.3 mm. long, 0.7 mm. wide; pistil 3.6 mm. long, the styles filiform, 2.0 mm. long, free to the ovary, the ovary densely sericeous, hairs simple and forked, 1–1.4 mm. long.

Fruit (4–) 5.2–9.0 (–10) mm. long, with an arista 0.5–2.0 mm. long, 4.2–6.5 mm. wide, globular-ovoid, the dorsum of carpels rounded, the sulci between the carpels shallow, extending one-fifth the way to the center of the fruit, tomentulose and sericeous, hairs simple, forked and stellate, 0.1–1.5 mm. long, the stipe 0–0.9 mm. long; dehiscence all along the ventral sutures and a third to half way along the dorsal sutures, partly septicial; seeds wingless, 2.4–3.5 mm. long, 1.2–1.9 mm. wide.

Flowering specimens collected in March, April, and June to December; fruiting ones in March and June to December.

TYPE LOCALITY: Marianas Islands, probably Guam. The type was collected by Gaudichaud and is cited below.

DISTRIBUTION: Palau, Yap, and Marianas Islands, in forest or on cleared land, on coastal plain, on limestone, at 1–170 meters elevation.

CAROLINE ISLANDS: PALAU ISLANDS: Peleliu Island, SW. side, *Fosberg* 25983 (BISH, US). Urukthapel Island, E. end, around lighthouse on top of peak, *Fosberg* 32039 (BISH, US). YAP ISLANDS: YAP ISLAND: *Hallier* 547 (L). *Kanehira* 1121 (US). Low E. ridge of Mt. Matade, slopes just above Yap Town, *Fosberg* 25574 (BISH, US). RUMUNG: *Ross* Oct. 5, 1949 (US). TOMIL ISLAND: *Hosaka* 3293 (BISH, US). ULITHI ATOLL: Mogmog Island, *Knox* 829 (US); *Fosberg & Wong* 25471 (BISH, US). Potangeras Island, *Hosaka* 3237 (BISH, US).

MARIANAS ISLANDS: *Gaudichaud* 66 (G, type, US neg. 5415). GUAM: Oca Point, *Moore* 43 (US). Machanao Dist., *Bryan* 1197 (US). N. of NW. Field, *Steere* 1 (US). N. end of Harmon Field, *Fosberg* 39252 (BISH, US). Ritidian Point, *Fosberg* 25317 (BISH, US); *Hosaka* 3091 (BISH, US); *Anderson* 218 (BISH, US). Vicinity of Agaña, *Anderson* 174 (BISH, US). ROTA: Rota and vicinity, *Fosberg* 25068 (BISH, US). NW. coast of W. end of main part of island, between Rota and Tataacho Point, *Fosberg* 25017 (US). SAIPAN: W. of Lake Susupe, *Fosberg* 25264 (BISH, US).

This species is closest to *M. villosissima*. Differences are given under the description of the latter species.

11. *Melochia villosissima* (Presl) Merr. Philip. Journ. Sci. 15:543. 1919.

Riedlea villosissima Presl, Rel. Haenk. 2:146. 1835.

?*Melochia Lessoniana* K. Schum. ex Volken, Eng. Bot. Jahrb. 31:468. 1902, nomen nudum.

Melochia hirsutissima Merr. Philip. Journ. Sci. 9:113. 1914.

Usually a shrub, sometimes a small tree, 0.7–7.6 meters high, the young stems and petioles densely fuscous-rufescent tomentose, hairs forked, simple, and stellate, 0.3–2.0 mm. long, the internodes 0.3–14 cm. long; stipules 2–5 (–9) mm. long, 1.0–2.5 (–7.0) mm. wide, lanceolate to ovate, acute, sericeous-tomentose and ciliate, hairs forked, stellate, and simple, 0.7–2.0 mm. long; petiole 1.1–14.5 cm. long.

Lamina 4.4–30 cm. long, 3.0–21.5 cm. wide, ovate, largest blades sometimes with a pair of lateral lobes 2 cm. high and 2 cm. wide, the base rounded to cordate, the apex acute, typically canescent and densely woolly on both surfaces, hairs forked and stellate (shorter ones), 0.2–1.2 mm. long, the margin irregularly crenate-serrate, serrations 1.1–3.2 mm. wide, 0.5–1.1 mm. high, 6–8 pairs of primary veins, 2 are basal.

Inflorescences usually compact, 4–14 cm. long, in axils of upper 4–6 leaves, corymbiform, flowers fragrant, number usually moderate, sometimes few or numerous, the peduncle thick, 2–3.5 mm. wide, 2.8–9.0 (–15.5) cm. long, usually with a short primary branch to 1.0 (–5.5) cm. long, rarely a secondary one 0.5 (–2.5) cm. long, rarely a tertiary one 0.5 (–3.0) cm. long, the pedicels usually very short, 1–2 (–4) mm. long; bracts 2–3.5 mm. long, 1.1–2.5 mm. wide, ovate, acute to rounded at the apex, hirsute and ciliate, hairs forked, stellate, and simple, 0.3–1.3 mm. long.

Calyx thick, 7.9–8.7 mm. long, 5.2–7.0 mm. wide, densely sericeous-tomentulose, hairs ferruginous, stellate and forked, 0.2–1.5 mm. long, the teeth 3.3–4.0 mm. long, 2.7–3.3 mm. wide, deltoid to ovate,

acute to slightly acuminate, the sinus acute; petals pink to red, sometimes fading distally, rarely magenta, relatively thick, 7.4–8.9 mm. long, 3–5 mm. wide, obovate, sometimes emarginate, attached to the staminal tube for 1–1.7 mm., the claw 1.5–2.0 mm. long.

Longistylous form. Stamens 5.2 mm. long, the filaments united up to the anthers, the staminal tube rose colored, the anthers 1.7–1.9 mm. long, 1.2–1.4 mm. wide, oblong, emarginate nearly to the middle from both ends; pistil 8.5 mm. long, the styles filiform, papillose for 1.5 mm., free to the ovary, 5.0 mm. long, the ovary ovoid, densely sericeous, hairs 0.9–1.8 mm. long, stipe none.

Brevistylous form. Stamens 5.8–6.1 mm. long, the filaments free for 3 mm., the anthers 1.8–1.9 mm. long, 0.7–0.9 mm. wide; pistil 5.3 mm. long (some development), the styles 2 mm. long, the ovary globular-ovoid, densely sericeous-tomentose, hairs to 1.7 mm. long.

Fruit (4–) 6.4–7.0 (–8.0) mm. long, of which 1–1.5 (–3) mm. is arista, 5.2–6.0 mm. wide, globular-ovoid, the dorsum of carpels obtuse-angled, the sulci between the carpels shallow, in the distal half of the fruit, extending a fifth to half way to its center, densely tomentose, hairs simple, forked, and stellate, 0.3–1.3 mm. long, the stipe 0–0.5 mm. long; dehiscence all along the ventral sutures and a fifth to half way along the dorsal sutures, also partly septicial; seeds generally wingless, 3.0–3.5 mm. long, 1.5–2.0 mm. wide, trigonal, of 10 seeds examined only one had a faint indication of a wing, 0.3 mm. high and 1 mm. wide, the apex rounded.

Flowering and fruiting specimens collected throughout the year except in November, most commonly in June to September.

TYPE LOCALITY: Guam.

DISTRIBUTION: Caroline and Marianas Islands, usually in disturbed, open, shrubby areas previously cultivated, on soils or rocks of volcanic or limestone origin, at 1–360 meters elevation.

CAROLINE ISLANDS: Tjaperna plateau (?Kusaie), *Hallier* Aug. 27, 1903 (L). PALAU ISLANDS: Arukoron-sôgen, *Hosokawa* 7044 (A, US). BABELDAOB ISLAND: E. coast, hills between Melekiok and Lake Ngardok, *Fosberg* 32596 (BISH, US). NGARAKABESANG (ARAKABESAN) ISLAND: S. side of W. peninsula, *Fosberg* 32131 (BISH, US). GASPAN: *Hosokawa* 9641 (A). TRUK ISLANDS: MOEN ISLAND: E. end, *Hosaka* 2795 (BISH, US); Slopes of Mt. Tonaachau (Toladjau), *Fosberg* 24431 (BISH, US). DUBLON ISLAND: *Fosberg* 24536 (BISH, US). SENYAVIN ISLANDS: PONAPE: Matalanim, *Hosaka* 3548 (BISH, US). KUSAIE: *Kanehira* 1343 (US). Lelehafen's Königsland, *Hallier* Sept. 3, 1903 (L). Lowest slopes and foot of S. side of Mt. Matanta (Buache) N. of head of Lela Harbor, *Fosberg* 26570 (BISH, US). LELU ISLAND: *Clarke* Ku-78 (US).

MARIANAS ISLANDS: GUAM: *McGregor* 456 (L, US, isotypes of *M. hirsutissima*). *Nelson* 1 (US), 353 (US). Faepi Point, approach to Mt. Lamlam, *Necker* 374 (US). Near Telefofo (?Talofof) River, *Rodin* 683 (US). Agat, Achugao, *Hosaka* 3192 (BISH, US). Mt. Tenjo and Mt. Reconnaissance area, *Moore* 217 (US). S. of Asan Point and Piti, *Anderson* 73 (BISH, US). Lower

Fonte River, W. of Agaña, *Fosberg* 31238 (BISH, US). Chalandao Mt. 1 km. SE. of Jumujong Manglo Mt., *Fosberg* 35379 (BISH, US). Anao (?Anae), above cliffs, *Fosberg* 38639 (BISH, US). Com.-Marianas Fuel Storage Area, *Fosberg* 35213 (BISH, US). Mataguac, *Moran* 4449 (US). ROTA: Necker R52 (US). *Kanehira* 1762 (US). *Hosokawa* 7556 (A, US). Airstrip, N. of Shimapaaru, *Fosberg* 25158 (BISH, US). SAIPAN: Oleai, *Fosberg* 31283 (BISH, US). Raishingan, *Hosokawa* 8028 (US). PAGAN: *Anderson* 501 (BISH, US). AGRIHAN (AGRIGAN): Trail around S. side of island on coastal strip, a narrow shelf, *Fosberg* 31567 (BISH, US).

This species is closest to *M. compacta*. The leaves of the latter are glabrescent, those of *M. villosissima* are persistently fairly densely hairy. The hairs of the young stems of *M. villosissima* are twice as long as those of *M. compacta*.

Section II. *Mougeotia* Griseb. Fl. Brit. W. Ind. 94. 1859

Section *Anamorpha* Triana & Planch. Prodr. Flo. Novogran. 215. 1862.

Perennial, rarely annual, herbs to shrubs, rarely a small tree, 0.1–5.0 meters high, the taproot not thicker than the base of the stem or to 2.5 times thicker and 0.4–2.2 cm. wide, the young stems tomentulose, hirsute or pilose, sometimes canescent, hairs sometimes tan, golden or ferruginous, simple, stellate, forked, or glandular, 0.1–4.0 mm. long, internodes 0.4–11.0 cm. long; stipules 1.5–10.3 mm. long, 0.2–4.0 (–5.0) mm. wide, usually deltoid-acuminate or deltoid-acute or lanceolate, usually ciliate, and hirsute, sericeous or tomentulose, hairs simple, stellate or forked, rarely also glandular, 0.1–3.5 mm. long; petiole 0.1–6.7 (–8.0) cm. long.

Lamina 0.8–14.0 (–22) cm. long, 0.2–8.8 (–10.5) cm. wide, usually ovate or lanceolate, sometimes oblong-ovate or nearly orbicular, the base rounded to cordate, sometimes truncate, the apex usually acute or acuminate, sometimes rounded, both surfaces glabrate, tomentulose, sericeous or velutinous, hairs simple, forked, or stellate, rarely also glandular, 0.1–4.0 mm. long, the margin irregularly crenate-serrate, serrations 0.5–8.5 mm. wide, 0.3–3.6 mm. high, 5–14 (–15) pairs of primary veins, usually 2 are basal.

Inflorescences axillary, terminal, or both, 0.6–21.0 (–31) cm. long, spicate, subcapitate, paniculate, umbellate, or corymbiform, the flowers sometimes very fragrant, the peduncle 0–8.5 cm. long, rarely a primary branch 0.4–3.5 cm. long and a secondary one 0–1.5 cm. long, the pedicel 0–9.3 mm. long; bracts 0.5–9.5 mm. long, 0.1–3.9 (–4.8) mm. wide, usually narrower than the stipules, sometimes several immediately subtending each flower and sometimes 2 or 3 united part way, pubescence similar to that of the stipules.

Calyx at anthesis 3.0–7.8 (–8.5) mm. long, 2.4–6.5 mm. wide, sometimes accrescent, becoming up to 12.3 mm. long, 12.0 mm. wide,

tomentulose, hirsute or sericeous, sometimes ciliate, hairs simple, stellate, glandular or forked, 0.1–1.3 (–4.0) mm. long, the teeth 1.3–5.3 (–6.5) mm. long, 0.5–2.8 (–5.5) mm. wide, the sinus usually acute, sometimes narrowly rounded; petals usually yellow to orange, or white, sometimes pink, reddish, white with red veins or purple, 3.7–12.0 mm. long, 1.4–5.0 mm. wide, usually obovate or oblanceolate, cuneate, free of the staminal tube or attached to it for 0.3–1.5 (–2.7) mm., the claw 0–1.5 (–4.0) mm. long, rarely a few hairs just above the claw; anther 0.7–2.1 mm. long, 0.4–1.1 mm. wide, oblong, emarginate at both ends, usually to the middle from the apex, staminodes rarely present, 0.1–0.4 mm. long.

Longistylous form. Stamens 2.4–5.9 mm. long, the filaments united up to the anthers, but separate for 0.5–1.0 mm. in *M. ulmifolia*, rarely tufts of hair 0.4–1.3 mm. long present at the base of the staminal tube, alternate with the filaments, hairs 0.1–0.2 mm. long; pistil 2.6–8.8 (–12) mm. long, the styles free for 1.2–5.3 mm., usually to the ovary, sometimes united for 0.3–4.0 mm., papillose at the apex for 0.5–1.2 mm.

Brevistylous form. Stamens 2.8–8.2 mm. long, the filaments free for 0.5–5.0 mm.; pistil 2.3–6.0 mm. long, the styles free for 1.1–2.5 mm., usually to the ovary, sometimes united for 0.2–0.7 mm., papillose for 0.3–0.7 mm. at the apex.

Fruit 2.5–7.5 mm. long, 2.9–6.5 mm. wide, globular, pentagonal, the carpels usually obtuse at the base and carinate above the middle, the sulci usually shallow, extending one-fifth to one-third, rarely half, the way to the center of the fruit, usually tomentulose or hirsute, hairs usually stellate, forked, and simple, sometimes also glandular, 0.1–1.0 mm. long, the stipe 0–1.0 mm. long; dehiscence usually septicial into cocci, or sometimes along the entire ventral suture and a third to half way along the dorsal suture and slightly septicial or tardily septicial and the fruit falling apart; seeds 1.5–3.0 mm. long, 0.9–2.0 mm. wide, rarely the chalazal end loosened, membranous, and almost winglike for 0.1–0.3 mm., usually 1 per cell but often 2.

LECTOTYPE: *Melochia pilosa* (Mill.) Fawc. & Rendle.

DISTRIBUTION: Mexico, West Indies, Central America, and South America to Argentina, in thickets, llanos, fields, savanna and woods, at 0–3,150 meters elevation.

12. *Melochia pilosa* (Mill.) Fawc. & Rendle, Fl. Jamaica 5:164. 1926.

Sida pilosa Mill. Gard. Dict. ed. 8. 1768.

Melochia venosa Sw. Prodr. Veg. Ind. Occ. 97. 1788.

Mougeotia polystachya H. B. K. Nov. Gen. & Sp. 5:328, pl. 483. 1823.

Riedleia polystachya (H. B. K.) DC. Prodr. 1:490. 1824.

Riedleia Jamaicensis DC. Prodr. 1:492. 1824.

- Melochia Jamaicensis* Balb. ex DC. Prodr. 1:492. 1824.
Riedleia venosa (Sw.) DC. Prodr. 1:492. 1824.
Melochia sericea St.-Hil. Fl. Bras. Mer. 1:160. 1825.
Melochia ulmarioides St.-Hil. Fl. Bras. Mer. 1:159. 1825.
Visenia polystachya (H. B. K.) Spreng. Syst. 3:30. 1826.
Visenia venosa (Sw.) Spreng. Syst. 3:30. 1826.
Visenia sericea (St.-Hil.) Spreng. Syst. 4:Cur. Post. 248. 1827.
Visenia Ulmariae Spreng. Syst. 4:Cur. Post. 248. 1827.
Riedleia virgultosa Macfad. Fl. Jamaica 1:104. 1837.
Riedleia interrupta Schlecht. Linnaea 11:375. 1837.
Riedleia sericea (St.-Hil.) Steud. Nom. II, 2:460. 1841.
Riedleia Ulmariae (Spreng.) Steud. Nom. II, 2:460. 1841.
Melochia gracilis St.-Hil. & Naud. Ann. Sci. Nat. II, 18:35. 1842.
Melochia nitidula St.-Hil. & Naud. Ann. Sci. Nat. II, 18:35. 1842.
Melochia polystachya (H. B. K.) Triana & Planch. Ann. Sci. Nat. IV, 17:341. 1862.
Melochia interrupta (Schlecht.) Hemsl. Biol. Centr. Amer. Bot. 1:131. 1879.
Riedleia argentea Poepp. ex Schum. in Mart. Fl. Bras. 12(3):37. 1886, in synonymy.
Melochia betonicaefolia Ruiz & Pavon ex Schum. in Mart. Fl. Bras. 12(3):37. 1886.
Melochia paniculata Willd. ex Schum. in Mart. Fl. Bras. 12(3):37. 1886.
Melochia venosa Sw. var. *typica* Schum. in Mart. Fl. Bras. 12(3):37. 1886.
Melochia venosa Sw. var. *polystachya* (H. B. K.) Schum. in Mart. Fl. Bras. 12(3):37. 1886.
Melochia venosa Sw. var. *betonicifolia* Schum. in Mart. Fl. Bras. 12(3):37. 1886.
Melochia venosa Sw. var. *sericea* (St.-Hil.) Schum. in Mart. Fl. Bras. 12(3):38. 1886.
Melochia venosa Sw. var. *Widgrenii* Schum. in Mart. Fl. Bras. 12(3):38. 1886.
Melochia "nervosa" (= *venosa* Sw.) β *polystachya* (H. B. K.) Schum. var. *flava* O. Ktze. Rev. Gen. 3(2):25. 1898.
Melochia venosa Sw. var. *squarrosa* Schum. & Hassl. Bull. Herb. Boiss. II, 4:71, in 1903 for 1904.

An erect herb or suffrutex, sometimes frutex, 0.4–3.0 (–4.0) meters high, simple or branched, the branches slender, to 15 cm. long, sometimes 2 or more shoots from near the base, the root thickened, to 2.5 times the diameter of the base of the stem, 0.8–1.2 cm. wide, woody; young stems sometimes hollow, hirsute, pilose or tomentose, sometimes woolly, hairs tan or golden, sometimes ferruginous, mostly simple, sometimes also glandular and a few forked or stellate, 0.1–2.2 mm. long, internodes 0.8–8.0 cm. long; stipules deciduous, (3–) 4–10 mm. long, 0.7–4.0 mm. wide, deltoid-acuminate, ovate-acute, or lanceolate, sometimes slightly oblique, sericeous, ciliate, hairs simple, 0.2–1.5 mm. long; petiole 0.2–2.7 (–5.0) cm. long, pubescence similar to that of the young stems.

Lamina 2.2–9.5 (–11) cm. long, 0.9–7.5 cm. wide, ovate, oblong-ovate, ovate-lanceolate, lanceolate, or subelliptic, the base rounded to subcordate, the apex acute to somewhat rounded, leaves im-

mediately below the inflorescence reduced, the upper surface usually green, sericeous, hirsute or puberulous, sometimes glabrescent, sometimes scabrous or woolly to the touch, hairs simple, sometimes a few forked or stellate, 0.2–1.0 mm. long, the lower surface green, or covered with brownish, golden or ferruginous hairs, sericeous or pilose on the veins, hairs simple, to 1.3 mm. long, sometimes densely tomentulose between the veins with hairs erect, stellate, forked, and simple, rarely also glandular, 0.2–0.7 mm. long, velvety or woolly to the touch, sometimes glabrescent, the margin irregularly crenate-serrate, serrations 0.6–4.8 mm. wide, 0.3–2.7 mm. high, primary veins numerous, (7–) 8–11 (–13) pairs, 2 or 3 are basal, more or less parallel, straightish and ascending at a rather acute angle (about 40°), impressed above, prominent beneath.

Inflorescences principally terminal, extending (2–) 10–20 (–31) cm. beyond the first leaf, at 3–11 nodes, paniculate, contracted or open, sometimes spicate, the flowers tending to be more numerous on the upper side of the brachlets, in subcapitate umbels of (1–) 3–12 flowers, the brachlets 1.5–3.5 cm. long, usually also axillary, 1–11.8 cm. long, in the axils of 1–5 or more reduced leaves, at 1–3 nodes, the peduncle 0–0.3 cm. long, the pedicel usually short, 1–3 (–5) mm. long; bracts usually separate, rarely 2 or 3 united at the base, 1.5–5.0 mm. long, 0.2–2.1 mm. wide, deltoid-acute to deltoid-acuminate, ovate, lanceolate or linear, ciliate, sericeous, hairs simple, 0.1–1.0 mm. long.

Calyx (4.0–) 4.6–7.5 mm. long, (2.5–) 2.9–5.3 mm. wide, not accrescent, external surface hirsute, sericeous, or tomentulose, hairs simple, sometimes also glandular, stellate or forked, 0.1–1.0 mm. long, the internal surface densely puberulous at the apex, the teeth 2.5–4.7 mm. long, 0.9–2.2 mm. wide, deltoid-acuminate or deltoid-acute, the sinus acute or narrowly rounded; petals usually yellow, sometimes orange, 5.9–10.5 mm. long, 2.0–4.5 mm. wide, obovate to oblanceolate, sometimes cuneate, the claw 1–2 mm. long, attached to the staminal tube for 0.5–1.0 mm.

Longistylous form. Stamens 3.4–5.3 mm. long, the filaments united up to the anthers, the anther 0.9–1.5 mm. long, 0.5–0.7 mm. wide, oblong, emarginate at both ends, nearly to the middle from the apex; pistil 4.6–8.3 mm. long, the styles 2.6–5.0 mm. long, free to the ovary or united for 0.5 mm., stigmatic for 0.5–1.0 mm., the ovary oblong, ellipsoid, ovoid or globular, densely hirsute-sericeous at the apex, less so below, hairs 0.2–1.5 mm. long, stipe none.

Brevistylous form. Stamens (5.1–) 6.3–7.5 mm. long, the filaments free for 2.6–4.2 mm., glabrous, the anther 1.1–1.3 mm. long, 0.6–0.8 mm. wide, shape same as that above, sometimes very small staminodal teeth present; pistil (3.3–) 3.7–4.7 mm. long, the styles (1.1–) 1.7–2.2 mm. long, free to the ovary or united for 0.2–0.5 mm.,

stigmatic for 0.3–0.5 mm., the ovary globular-ovoid, densely hirsute-sericeous, hairs simple, 0.2–1.0 mm. long.

Fruit globular or suboblong, obtusely pentagonal, (3.7–) 4.2–6.0 mm. long, (3–) 4.2–5.0 mm. wide, usually slightly longer than wide, the rostrum 0.3 mm. long, hirsute-tomentulose, hairs simple, 0.3–1.1 mm. long, sometimes also forked and stellate, rarely glandular, 0.1–0.2 mm. long, the sulci between the carpels very shallow, extending a fifth to a fourth the way to the center of the fruit, the base sometimes narrowed into a stipe 0.5 mm. long; dehiscence all along the ventral suture and a third to half way along the dorsal suture, eventually also septicial, the fruit falling apart; seeds 1.6–2.7 mm. long, 1.1–1.6 mm. wide, dark brown, 1 or 2 per cell.

Flowering and fruiting specimens collected throughout the year.

TYPE LOCALITY: Jamaica. Miller's type is in the herbarium of the British Museum.

DISTRIBUTION: Vera Cruz, Mexico, Jamaica, Venezuela, Colombia, southern and western Brazil, Ecuador, Peru, Bolivia, Paraguay and northern Argentina, in campo and thickets, usually in dry, open habitats, in savanna, on hillsides, in rocky, calcareous soil, at 224–2,000 meters elevation, usually above 500 meters.

MEXICO: VERA CRUZ: Hacienda de la Laguna, *Schiede* s.n. (P, isotype of *Riedleia interrupta* Schlecht.). F neg. 35381 ex P of type of *Riedleia interrupta* Schlecht. (US). ?VERA CRUZ: Pacho (?Pacho Viejo), *Liebmann* 11874 (US).

JAMAICA: *Swartz* s.n. (S, type of *Melochia venosa* Sw., also US neg. 5606). *Balbis* s.n. (S). Constitution Hill, *Harris* 6815 (US), 9026 (US). Along the road to Newcastle, *Rishbeth* s.n. (J).

VENEZUELA: *Vogl* 334 (S). MIRANDA: San Blas?, *Gines* 4414 (US). FEDERAL DISTRICT: Caracas and vicinity, *Pittier* 6151 (US); *Curran & Haman* 1063 (US); *Martin?* (S). Road from Caracas to La Guayra, *Pittier* 5898 (US), 9557 (US). Lower Catuche wood above Caracas, *Pittier* 7027 (US). Lower Cotiza near Caracas, *Pittier* 7888 (MICH, US). Rio Catuche, *Eggers* 13062 or 13162, July 9, 1891 (L). ARAGUA: Colonia Tovar, La Victoria, *Fendler* 111 (GH), 1929 (GH). COJEDES: San Carlos, *Velez* 2753 (US). MÉRIDA: Tabay, *Gehriger* 444 (US).

COLOMBIA: *Triana* s.n. (W). MAGDALENA: Sierra Nevada de Santa Marta, *Barkley & Araque* M. 38 (US). Between Pueblo Viejo and San Miguel, *Seifriz* 354 (US). Santa Marta, *H. H. Smith* 471 (L, S, US). NORTE DE SANTANDER: Ocaña, *Schlim* 73 (P). SANTANDER: Upper Rio Lebrija valley, NW. of Bucaramanga, *Killip & Smith* 16307 (US). CUNDINAMARCA: Sasaima, *Bro. A. Marie* 20E (US). TOLIMA: Honda, *Humboldt & Bonpland* 1803 (P, isotype of *Mougeotia polystachya* H. B. K., also US neg. 5669). Mariquita, *Pennell* 3627 (US). HUILA: E. of Neiva, *Rusby & Pennell* 496 (US). San Antonio Fortalecillas, *Fosberg* 19837 (US). ANTIOQUIA: Bello, *Archer* 138 (US). CALDAS: Anserma, *Pennell* 10637 (US). Supia, *Pennell* 10696 (US). VALLE DEL CAUCA: Palmira, *Pennell & Killip* 6033 (US). Puerto Caldas, *Killip & Hazen* 11033 (US). CAUCA: Rio Patia, *von Sneider* 2401 (S, US).

ECUADOR: "Yapio cerca Quilichao," *Jameson* s.n. (US).

PERU: *Mathews* 3307 (S). Vitoc and Chacahuassi, F neg. 9609 of *Ruiz*

s.n. ex B, presumably of type of *Melochia venosa* Sw. var. *betonicifolia* Schum. (US). CAJAMARCA: Jaen, *Weberbauer* 6200 (US). Valley of Tabaconas River, *Weberbauer* 6244 (US). SAN MARTÍN: Tarapoto, *Ferreyra* 5104 (US). Alto Rio Huallaga, *Ll. Williams* 6685 (US), 5802 (S). LORETO: Near Tarapoto, *Ute* 6436 (L). HUÁNUCO: Cuchero, *Poeppig* addenda 71 (W), 1269, in part (W). CUSCO: Lares Valley between Calca and Pasto Grande, *Weberbauer* 7932 (S, US).

BOLIVIA: Chiquiacá, *Fiebrig* 2722 (L). Florida and Palissa, *Herzog* 1294 (L, S). Ixiamas, *Cardenas* 1916 (MICH). Guanai, *Rusby* 1846 (MICH). Yungas and vicinity, *Rusby* 1847 (MICH); *Bang* 517 (MICH, US), 2810 (MICH, S, US). NORTH YUNGAS: Milluguaya, *Buchtien* 789 (S), 6021 (S). BENI: Trinidad-Misiones Guarayos, *Werdermann* 2504 (S). SANTA CRUZ: SARA: Buena Vista, *Steinbach* 7413 (S).

BRAZIL: *Pohl* 560 or 160 (W). MINAS GERAIS: Near São Antonio de Rio to Cima not far from Villa Rica (=Ouro Preto), *St.-Hilaire* 2295 (P, isotype of *Melochia sericea* St.-Hil., also US neg. 5673). Caldas, *Regnell* I 20 (R, S, US), I 20a (US); *Widgren* 245 (GH, S); *Lindberg* 285a (S), 284a (S). Corinto, Fazenda do Diamante, *Mexia* 5549 (GH, MICH, R, S, US). Ituiutaba, *Macedo* 4159 (US). Itabira do Campo, *Schwacke* s.n. (R). Belo Horizonte, Colonia Bias Fortes (Jardim Bot. Bel. Horiz. 5356). Belo Horizonte, *Barreto* 7862 (R), 10380 (R). Caxambu near das Aguas, *Glaziou* 15848 (R). Mantiqueira pelo vale do rio Verde até Três Corações, *de Saldanha* 8724 (R). Lagoa Santa, *Warming* s.n. (S). Between Sitio and Dr. Sa Fortes, Serra Mantiqueira, *Chase* 8675 (GH). SANTA LUZIA: Venda Nova, *L. O. Williams & Assis* 6511 (US). CAMPINA VERDE: Manga, *Macedo* 362 (US). GOIÁS: Near the city of Goiás, *Burchell* 6993 (K). São Domingos, *Gardner* 4105 (GH). Corallinho, *Pohl* 1310 (W). Caretão, *Pohl* (W). JATAI: Queixada, *Macedo* 1549 (US). MATO GROSSO: Coxipo da Ponte, *Hoehne* 3026 (726)(R). Maribondo St. Laurenço, *Hoehne* 2995 (721)(R). Tapirapoan, *Hoehne* 1511 (R). Porto Esperidião, Jaurú, *Hoehne* 704 (327)(R). Casa da Pedra, *Armond* (R 78143). Coxipo Mirim near Cuyabá, *Malme* s.n. (S). SÃO PAULO: *Burchell* 5618 (K). Itú, *Riedel* 1993 (W). Near Mogyguassú *Mosén* 1127 (S). PARANÁ: Jaguariahyva, *Dusén* 16172 (S, US); *Jonsson* 353a (S). Restinga Secca, *Dusén*, 4238 B(R). Seugés-Fabio Rego, *Dusén* 10979 (S). Capão Grande, *Dusén* 9167 (S). Morungava, *Dusén* 17384 (S). Itaperussú, *Dusén* 13855 (S). TIBAGI: Fda. Monte Alegre, Harmonia, *Hatschbach* 2872 (US), 2972 (US). CAMPO MOURÃO: Campo Mourão, *Hatschbach* 8770 (US). SANTA CATARINA: Rio Capinzal, *Dusén* 17851 (GH, S). CURITIBANOS: Butia campo, 19 km. E. of Lebon Regis, *L. B. Smith & Klein* 11052 (US). Curitiba, *Miller* 83 (R). CAÇADOR: 31 km. W. of Caçador, *L. B. Smith & Klein* 10921 (US). CAMPOS NOVOS: 33 km. SE. of Campos Novos, *L. B. Smith & Klein* 11205 (US). Ile Sainte Catherine *Gaudichaud* s.n. (P). RIO GRANDE DO SUL: Santa Maria, *Alleoa Vidal* (R 78201, US); ?*Vida* (R); *Malme* 1236 (S). São Leopoldo, *Leite* 2518 (A); *Rambo* (PACA 1161), (PACA 1289); *Theissen* 398 (PACA), 582 (PACA), (PACA 25115); *Ritter* (PACA 35405). Sapucaia near São Leopoldo, *Rambo* (PACA 38174), (PACA 40768), (PACA 44277). Cristo Rei near São Leopoldo, *Rambo* (PACA 46206). Vicinity of TUPANCIRETÃ: Jarí, *Rambo* (PACA 9142), (PACA 9485). Ijusinho, *Rambo* (PACA 9989). At Ivaí River, *Rambo* (PACA 9474). Vicinity of SÃO LUIZ: Caaró, *Rambo* (PACA 53454). Cerro Largo, *Sehnem* (PACA 48091). Lagoa Vermelha and vicinity, *Friderichs* (PACA 11134), (PACA 11859). Passo do Socorro, *Rambo* (PACA 51506). Nonoai near Uruguay River, *Rambo* (PACA 28272). Cachoeira, *Malme* 988 (S). Santo Angelo, *Rambo* (PACA 53001). Kappesberg near Montenegro, *Sehnem* (PACA 48376). São Borja, *Rambo* (PACA

3029). Palmeira, *Rambo* (PACA 50011). Neu-Württemberg (Panambi), *Bornmueller* 433 (GH). Near an abrupt descent, called Salto, in the swiftly flowing Uruguay River, *St.-Hilaire* 2526 (P, isotype of *Melochia ulmarioides* St.-Hil., also F neg. 35387 ex P, type of *Melochia ulmarioides* St.-Hil. (US).

URUGUAY: Cuiñapirú (Brazilian frontier), *Rambo* (PACA 4024).

PARAGUAY: San Luis between Rio Apa and Rio Aquidaban, *Fiebrig* 4412 (GH, K, L). Upper part of Rio Apa, *Hassler* 8058 (GH, S, isotypes of *Melochia venosa* Sw. var. *squarrosa* Schum. & Hassl.). Near Bellavista (Rio Apa), *Hassler* 8184a (GH, S). Villarrica, *Jorgensen* 3810 (S, US). Guarapi, *Balansa* 3254 (L, P). In valley of Y-acá River, *Hassler* 6587 (GH, S). Near Igatimi, *Hassler* 5529a(S). Est. Caballero, *Anisits* 374 (S). Est. Santa Maria, *Anisits* 2412 (S). Central Paraguay, *Morong* 403 (US).

ARGENTINA: SALTA: ROSARIO DE LERMA: Campo Quijana, *Venturi* 8213 (GH). TUCUMÁN: Muñecas, *Schreiter* 1935 (S). FAMAILLA: San Pablo, *Venturi* 1175 (S, US). CAPITAL: Rio Sali, *Venturi* 1175a (GH, US). TAFI: Cumbre de Taficillo, *Venturi* 6047 (US). BURROYACO: Cerro del Campo, *Venturi* 10326 (S). FORMOSA: Laishi, *Jorgensen* 2324 (GH, US). MISIONES: Posadas, Bonpland, "La Granja," *Ekman* 181 (S), 182 (S, US). SAN IGNACIO: San Ignacio, *Vattuone & Bianchi* 143 (US); *Montes* 479 (UC). Gobernador Roca, *Montes* 562 (UC). CANDELARIA: Puerto Santa Ana, *Schwarz* 623 (UC). Loreto, *Montes* 439 (UC). Piaido Finlandesa, *Schwarz* 690 (UC). Arroyo "Martin chico," *Schwarz* s.n. (UC).

Because the differences between the varieties described in this species are so minor, and the transition between them so gradual, and because the varieties are more or less sympatric, I do not consider the varieties worthy of retention. However, in general, the species is hairier in the southern portion of its range than in the northern.

This species is most closely related to *M. hassleriana* Chod., but the pubescence, peduncles, and pedicels are generally longer in the latter species. *M. pilosa* usually has a longer terminal inflorescence, a greater total number of flowers, and more per cluster, and the flowers tend to be more frequent on the upper side of the branchlets; the flowers are rather evenly distributed in *M. hassleriana*.

M. pilosa is also related to *M. chamaedrys* St.-Hil. The major differences between them are mentioned under the description of the latter species.

13. *Melochia hassleriana* Chod. Bull. Herb. Boiss. II, 1:403. 1901.

Melochia ulmarioides St.-Hil. f. *sericea*, f. *Hassleriana* (Chod.), and f. *brevipedunculata*, all Schum. & Hassl. Bull. Herb. Boiss. II, 4:71. 1903.

Melochia ulmarioides St.-Hil. f. *albo-villosa* R. E. Fries, Svensk. Vet. Acad. Handl. 42(12):10. 1908.

An ascendent or procumbent suffrutex 0.5–1.5 meters high, with several stems from the base, the root woody, thickened, 0.7–1.0 cm. wide, the young stems and petioles pilose, hairs simple, straight, 1.5–4.0 mm. long, also shorter, recurved, 0.3–0.5 mm. long, internodes 1.5–7.0 cm. long; stipules 6–10.3 mm. long, 0.8–1.0 mm. wide, lance-

olate, ciliate and pilose or sericeous, hairs simple, 2–3.5 mm. long; petiole short, 0.1–1.0 cm. long.

Lamina 2.5–5.5 cm. long, 0.9–3.0 cm. wide, lanceolate to ovate, the base rounded, the apex acute, the upper surface sericeous-pilose, hairs tan, simple, 1.3–4.0 mm. long, the lower surface sericeous-pilose on the veins, hairs tan, simple, 1.7–4.0 mm. long, usually also stellate, 0.2 mm. long, between the veins, the margin long-ciliate, irregularly crenate-serrate, serrations 1.2–5.2 mm. wide, 0.6–1.5 mm. high, 8–13 pairs of straight, parallel primary veins, 2 are basal.

Inflorescences axillary, 3.5–5.5 cm. long, in the axils of the upper 2–4 leaves, also terminal, extending 3–6.5 cm. beyond the first leaf, the peduncle 0.5–3.0 cm. long, the ultimate divisions umbellate, 2–5 flowers per umbel, more than one umbel per peduncle, the pedicels 2.5–4.0 mm. long at anthesis, up to 6.0 mm. long in the fruiting state; bracts 3.5–9.5 mm. long, 0.3–1.5 mm. wide, lanceolate to nearly linear, ciliate and sericeous, hairs simple, 1–3 mm. long.

Calyx 6.3–7.8 mm. long, 3.4–4.4 mm. wide, not accrescent, pilose-sericeous and ciliate, hairs simple, 1–4 mm. long, also stellate, 0.1 mm. long, the teeth 3.7–5.5 mm. long, 1.4–1.8 mm. wide, deltoid-acuminate, the sinus acute; petals yellow to orange, 10–11.5 mm. long, 3.2–3.4 mm. wide, obovate-cuneate, attached to stamens for 1–1.5 mm., the claw 1 mm. long.

Longistylous form. Stamens 5.0 mm. long, the filaments united up to the anthers, the anther 1.2–1.3 mm. long, 0.6 mm. wide, oblong, emarginate at both ends, nearly to the middle from the apex; pistil 8.8 mm. long, the styles filiform, papillose for 1.2 mm. at the apex, free for 4.6 mm., united for 1.5 mm., the ovary ovoid, pentagonal, sericeous, hairs simple, 1–2 mm. long.

Brevistylous form. Stamens 7.4–7.8 mm. long, the filaments free for 4–5 mm., the anther 1.1–1.6 mm. long, 0.7 mm. wide, shape same as that above; pistil 5.5–6.0 mm. long, the styles papillose for 0.7 mm. at the apex, 2.2–2.5 mm. long, free to the ovary, the ovary ellipsoid to globular, pentagonal, sericeous, hairs simple, 1–2.3 mm. long.

Fruit 5 mm. long, 4.8 mm. wide, remnant of styles 1 mm. long, globular, obtusely pentagonal, the sulci between the carpels rather shallow, extending a fifth to a fourth the way to the center of the fruit, sericeous, hairs simple, 1–2 mm. long, also stellate, 0.1 mm. long, the stipe 0.5 mm. long; dehiscence all along the ventral suture and half way along the dorsal suture, also slightly septicial; seeds 2.1–2.5 mm. long, 1.3–1.6 mm. wide, dark brown, 1 or 2 per cell.

Flowering specimens collected in October and December to March; fruiting ones, from December to March.

TYPE LOCALITY: The type was collected by *Hassler*, no. 1739, in thickets near Itacurubi, Paraguay. An isotype is cited below.

DISTRIBUTION: Paraguay and Paraná, Brazil, in campo, in sandy fields, in arid rocky places, at about 790 meters elevation.

BRAZIL: PARANÁ: Capão Bonito, *Dusén* 16903 (S).

PARAGUAY: Near Itacurubi, *Hassler* 1739 (NY, isotype). Along the road between Caacupé and Tobaty, *Archer & Rojas* 4856 (US). Road to Paraguay River, Hincinde ad Monte Calvario prope Villa occidental, *Lorentz* 33 (US). Capibary, *Hassler* 5917 (S). River Apa, *Hassler* 8074 (S, type of *Melochia ulmarioides* St.-Hil. f. *sericea* Schum. & Hassl.). Sierra de Maracaju, *Hassler* 5596 (S). In altaplanitie "Sierra de Amambay," *Hassler* 12038 (S). Near Igatimi, *Hassler* 4793 (S, type of *Melochia ulmarioides* St.-Hil. f. *brevipedunculata* Schum. & Hassl.), (W). Est. Armonia, *Anisits* 1913 (S, type of *Melochia ulmarioides* St.-Hil. f. *albo-villosa* R. E. Fries). San Luis between Rio Apa and Rio Aquidaban, *Fiebrig* 4451 (L).

This species has been misinterpreted as *Melochia ulmarioides* St.-Hil. I have seen the isotype of the latter species and consider it to be the same as *Melochia pilosa* (Mill.) Fawc. & Rendle.

This species is close to *Melochia pilosa* (Mill.) Fawc. & Rendle but differs in that the margins of the leaves are long-ciliate, the stems are usually less hairy, and the flowers are fewer and more loosely clustered. *M. pilosa* usually has a larger terminal inflorescence than *M. hassleriana*, and the flowers tend to be more frequent on the upper side of the branchlets but more evenly distributed in *M. hassleriana*.

14. *Melochia chamaedrys* St.-Hil. Fl. Bras. Mer. 1:161. 1825.

A small, procumbent or ascending, spreading herb to suffrutex 0.1–0.5 meter high, sometimes simple but usually with several slender shoots (2–10) from the root, the taproot thickened, woody, sometimes branched, 0.5–2.2 cm. wide, the young stems hirsute or rather densely covered with straight simple hairs 0.1–2.0 mm. long, curved simple ones 0.2–0.3 mm. long in a longitudinal line, and glandular ones 0.2–0.6 mm. long, internodes 1–3.3 (–7.5) cm. long; stipules 2.5–5.0 (–8.8) mm. long, 0.5–1.0 (–5.0) mm. wide, lanceolate, deltoid-acuminate or ovate, mostly ciliate, hairs simple, 0.2–2.0 mm. long, occasionally a few glandular, 0.2–0.3 mm. long; petiole 0.2–1.5 (–2.7) cm. long, indument similar to that of the young stems.

Lamina 1–4.3 (–6.5) cm. long, 0.8–3.0 (–4.5) cm. wide, ovate to nearly orbicular, rarely also oblong and lanceolate, the base rounded to cordate, the apex usually obtuse, sometimes also acute, the upper surface green, pilose, hairs scattered to rather dense, somewhat appressed, simple, usually also a few glandular, 0.1–1.6 mm. long, the lower surface green, similarly pubescent but more densely so, rarely stellate hairy, hairs 0.1–1.8 mm. long, the margin slightly irregularly crenate to crenate-serrate, crenations or serrations 0.5–3.2 mm. wide, 0.4–2.0 mm. high, 5–11 pairs of primary veins, 2 are basal.

Inflorescences axillary, (1.2-) 1.6-4.5 cm. long, in the axils of the upper 1-6 (-8) leaves and occasionally also terminal, extending 3.5 cm. beyond the first leaf, the ultimate divisions umbellate, few-flowered, 2-4 (-5) per umbel, the peduncle slender, 0.1-2.5 cm. long, sometimes absent, sometimes with a branch 0.4-0.5 cm. long, the pedicels slender, 1.6-9.3 mm. long, mostly glandular, hairs 0.1-0.4 mm. long; bracts, 0.6-4.0 (-8.3) mm. long, 0.1-1.3 (-4.8) mm. wide, lanceolate to ovate or linear, mostly ciliate, hairs simple, 0.1-1.7 mm. long.

Calyx 4.6-7.8 (-8.5) mm. long, 3.1-4.8 (-5.1) mm. wide, not accrescent, sericeous and ciliate, hairs simple and usually also glandular, 0.1-0.8 (-1.6) mm. long, the teeth 2.5-5.0 mm. long, 1.2-1.8 (-2.5) mm. wide, deltoid- to ovate-acute or ovate-acuminate, the sinus acute; petals yellow to orange, Weberbauer no. 6220 from Peru was rose with brown veins according to Macbride (39), 7.2-11 mm. long, 2.7-4.1 mm. wide, obovate-cuneate, attached to the staminal tube for 0.5-1.0 mm., the claw 0.9-1.8 mm. long, 5 minute glands sometimes present between the bases of the petals.

Longistylous form. Stamens 3.8-4.2 mm. long, the filaments united up to the anthers or separate for 0.5 mm., the anther 0.9-1.2 mm. long, 0.5-0.8 mm. wide, oblong, emarginate at both ends, nearly to the middle from the apex; pistil 4.8-7.5 mm. long, the styles filiform, free for 2.0-5.3 mm., united for 0.3-1.0 mm., papillose at the apex for 1 mm., the ovary ovoid to globular, pentagonal, hirsute to sericeous at the apex, hairs simple, 0.1-1.2 mm. long.

Brevistylous form. Stamens 6.1-8.2 mm. long, the filaments free for 3.2-5.1 mm., the anther 1.1-1.6 mm. long, 0.6-1.1 mm. wide, shape the same as that above; pistil 4-5 mm. long, the styles 2 mm. long, free to the ovary or united for 0.7 mm., papillose for 0.3-0.5 mm. at the apex, the ovary ovoid, pentagonal, hirsute-sericeous, mostly near the apex, hairs 0.2-1.3 mm. long.

Fruit 4.4-5.6 mm. long, 4.4-4.8 (-5.3) mm. wide, globular, sometimes suboblong, obtusely pentagonal, the sulci between the carpels shallow to moderately deep, extending a fifth to a third the way to the center of the fruit, covered with simple hairs 0.1-1.5 mm. long, sometimes a few forked and glandular hairs 0.1-0.4 mm. long, the base narrowed to a stipe 0.5-1.0 mm. long; dehiscence all along the ventral suture, a third to half way along the dorsal suture, and slightly septicial; seeds 1.5-2.6 mm. long, 1.1-1.5 mm. wide, trigonal, dark brown, rugulose, 2 per cell.

Flowering specimens collected in August, September, November to February, April, and May; fruiting ones, in September, November to February, and April.

Key to Varieties of *M. chamaedrys*

1. Lamina suborbicular, 1-2.3 cm. long, 0.9-2.7 cm. wide, apex obtuse, crenations up to 2 mm. high; pedicels 2.5-9.3 mm. long.

14a. *M. chamaedrys* var. *chamaedrys*

1. Lamina ovate, 1.2-4.5 (-6.5) cm. long, 0.8-3.0 (-4.5) cm. wide, apex usually acute, crenations up to 1.2 mm. high; pedicels 1.6-3.0 mm. long.

14b. *M. chamaedrys* var. *decumbens*

14a. *Melochia chamaedrys* St.-Hil. var. *chamaedrys*

Riedleia Chamaedrys (St.-Hil.) G. Don, Gen. Syst. 1: 529. 1831.

Melochia chamaedrys St.-Hil. f. *typica* Ekman, Arkiv. Bot. 9(4): 46. 1910.

Melochia chamaedrys St.-Hil. var. *loretensis* and var. *viscidula*, both Hassl. Addenda Pl. Hassl. 12. 1917 (without description).

Commonly, this variety is 0.1-0.3 meter long; stipules, 2.5-3.6 mm. long, 0.5-0.8 mm. wide; petiole 0.2-0.9 cm. long; lamina 1-2.3 cm. long, 0.9-2.7 cm. wide, nearly orbicular, the apex obtuse, the crenations, up to 2.0 mm. high, 5-7 pairs of primary veins; inflorescences 1.6-3.5 cm. long, the peduncle 0.6-1.7 cm. long, the pedicels 2.5-9.3 mm. long, the bracts 0.6-2.5 mm. long, 0.1-0.5 mm. wide.

TYPE LOCALITY: The type was collected by St.-Hilaire in herbaceous fields near the estate commonly called Estancia do Salto S. Itaroro, not far from the village of S. Francisci Borjensis, Misiones, Argentina. The isotype is cited below.

DISTRIBUTION: Peru, Brazil, Uruguay, Paraguay, and Argentina, in shrubby and herbaceous fields, in dry campo, on hills among dry calcareous rocks, and in thickets among rocks, at 60-800 meters elevation.

PERU: CAJAMARCA: JAEN: Near the confluence of Chinchipe and Marañon *Weberbauer* 6220 (US).

BRAZIL: BAHIA: Catinga de Moura, *Schreiner* in 1890 (R 78127). MATO GROSSO: Capão Bonito, *Archer & Gehrt* 86 (US). PARANÁ: PARANA: Campo Mourão: Rio da Vargem, *Hatschbach* 8757 (US). SANTA CATARINA: Campos Novos: 34 km. E. of Joaçaba, *L. B. Smith & Klein* 11181 (US). RIO GRANDE DO SUL: Campinas near Sta. Rosa, *Spies* (PACA 36029). Caaró near S. Luiz, *Rambo* 3056 (PACA), (PACA 53298), (PACA 53433). Cerro Largo near S. Luiz, *Buck* (PACA 11136). Livramento, *Rambo* 3950 (PACA). Pareí near Montenegro, *Rambo* (PACA 42973).

URUGUAY: SALTO: Arapey, *Herter* 2293 (S).

PARAGUAY: Villa Encarnacion, *Rojas* 7924 (S). Itapé, in canyon at the foot of Cordillera de Villarrica, *Jorgensen* 4477 in part (S), 4477 (A, US).

ARGENTINA: CORRIENTES: SANTO TOMÉ: Est. "Garruchos," *Pedersen* 971 (S, US). MISIONES: Near Est. do Salto S. Itaroro near S. Francisci Borjensis, *St.-Hilaire* (P, isotype). ?MISIONES: F neg. 9600 ex B, presumably an isotype of the species. Posadas, *Ekman* 183 (S), 184 (S). CANDELARIA: Loreto, *Montes* 560 (S).

This species is close to *Melochia pilosa* (Mill.) Fawc. & Rendle, but the latter is more robust. *M. pilosa* is erect and 0.4-3.0 meters high;

M. chamaedrys is procumbent or ascending and 0.1–0.5 meter high. The leaves are often suborbicular, those of *M. pilosa* are more elongate, usually ovate to lanceolate, and larger. The inflorescences are primarily axillary but primarily terminal in *M. pilosa*.

14b. *Melochia chamaedrys* St.-Hil. var. *decumbens* (Fries) A. Goldberg, comb. et. stat. nov.

Melochia decumbens R. E. Fries, Svensk. Vet. Akad. Handl. 42(12):11. 1908.

Melochia chamaedrys St.-Hil. f. *decumbens* Ekman, Arkiv. Bot. 9(4):46. 1910.

This variety is more robust than the typical variety. It is up to 0.5 meter long; stipules 4–5 (–8.8) mm. long, 0.7–1.0 (–5.0) mm. wide; petiole 0.2–1.5 (–2.7) cm. long; lamina more densely hairy than that of the typical variety, 1.2–4.5 (–6.5) cm. long, 0.8–3.0 (–4.5) cm. wide, ovate, the apex usually acute, crenations to 1.2 mm. high, 5–11 pairs of primary veins; inflorescences 1.2–4.5 cm. long, the peduncle (0–) 1–2.5 cm. long, the pedicel 1.6–3.0 mm. long, the bracts 2.6–4.0 (–8.3) mm. long, 0.6–1.3 (–4.8) mm. wide.

TYPE LOCALITY: The syntypes were collected by Anisits, nos. 2509 and 2656, at Estancia Santa Maria, Paraguay. The latter is selected as lectotype.

DISTRIBUTION: Paraguay and Argentina on dry, calcareous, rocky hills.

PARAGUAY: Estancia Santa Maria, *Anisits* 2509 (S, paratype), 2656 (S, lectotype, also US neg. 5617, syntypes of *Melochia decumbens* Fries).

ARGENTINA: MISIONES: Posadas, Bonpland, *Lilliesköld* s.n. (S, also US neg. 5618).

Ekman (see synonymy) considered *Melochia decumbens* Fries to be a form of *Melochia chamaedrys* St.-Hil. I consider it sufficiently distinct to have varietal status.

15. *Melochia kerriifolia* Triana & Planch. Ann. Sci. Nat. IV, 17:341. 1862.

Melochia Humboldtiana Steyerl. Fieldiana, Bot. 28(2):365. 1952.

An erect, slender-branched annual herb or suffrutex 0.2–0.8 meter high, the root not thickened, the young stems hirsute, hairs scattered and sometimes in a longitudinal line, simple, straight, and shorter recurved hairs and very few glandular hairs, 0.2–1.3 mm. long, internodes 1–11 cm. long; stipules 1.5–4.0 mm. long, 0.3–1.2 mm wide, deltoid-acute to deltoid-acuminate or lanceolate, mostly ciliate, hairs simple, 0.2–1.3 mm. long; petiole 0.1–2.3 cm. long, tomentose, especially on the adaxial surface, hairs mostly simple, some forked, few glandular, 0.5–1.8 mm. long.

Lamina 0.8–9.3 cm. long, 0.2–3.1 cm. wide, narrowly lanceolate to ovate, the base rounded to subcordate, the apex acute to slightly acuminate, the upper surface subglabrous, with a few simple, appressed or recurved hairs 0.1–1.0 mm. long on the midrib, and some-

times a few glandular hairs, especially on the margin, the lower surface with scattered, appressed, simple hairs 0.1–1.1 mm. long on the veins, the margins irregularly crenate-serrate to serrate, serrations 0.8–4.2 mm. wide, 0.5–1.9 mm. high, 5–14 pairs of primary veins, 1 or 2 are basal.

Inflorescences 1–21 cm. long, terminal and axillary, rarely also leaf-opposed, in the upper 1–4 axils, or on axillary branches up to 7.3 cm. long, with reduced leaves, slender, usually paniculate, the ultimate divisions umbellate, 2 or 3 (1–5) flowers per umbel, the peduncle slender, 0.6–8.5 cm. long, the pedicels 1.5–5.0 mm. long, with scattered glandular hairs; bracts 1–3.5 mm. long, 0.2–0.8 mm. wide, deciduous, deltoid-acute to deltoid-acuminate or lanceolate, mostly ciliate, hairs simple, 0.2–0.8 mm. long.

Calyx 3.0–4.7 mm. long, 2.4–4.0 mm. wide, not accrescent, hirsute and sometimes also ciliate, hairs simple, some glandular, rarely a few forked, 0.1–1.2 mm. long, the teeth 2.2–3.3 mm. long, 0.8–1.4 mm. wide, deltoid-acuminate, the sinus acute to narrowly rounded; petals yellow, 5.0–8.3 mm. long, 2.2–3.1 mm. wide, obovate, obovate-cuneate, or nearly elliptic, the claw 0.5–1.0 mm. long, attached to the stamens for 0.3–1.0 mm.

Longistylous form. Stamens 2.5–3.2 mm. long, the filaments united up to the anthers, the anther 0.8–1.1 mm. long, 0.4–0.6 mm. wide, oblong, emarginate at both ends, nearly to the middle from the apex, sacs slightly divergent at the apex, rarely 6 stamens; pistil 2.8–3.5 mm. long, the styles 1.2–1.7 mm. long, free to the ovary, filiform, papillose for 0.5–0.7 mm. at the apex, the ovary ovoid to globular-pentagonal, hirsute-sericeous, hairs simple and sometimes also forked and a few stellate, 0.2–0.7 mm. long, rarely 6 carpels, stipe none but base of carpels narrowed for 0–0.5 mm.

Brevistylous form not seen.

Fruit usually in pairs, 3.7–5.5 mm. long, 3.5–5.6 mm. wide, globular to somewhat oblong, obtusely pentagonal, the sulci between the carpels shallow, extending a fifth to a fourth the way to the center of the fruit, hirsute to tomentulose, hairs simple and sometimes forked and stellate, 0.1–1.0 mm. long, base narrowed to a stipe 0.5–1.0 mm. long; dehiscence all along the ventral suture and a third to half way along the dorsal suture, slightly septicial to completely septicial and the fruit falling apart; seeds 1.9–2.8 mm. long, 1.2–2.0 mm. wide, brown to black, trigonal, 2 per cell.

Flowering specimens collected in May, June, October, and November; fruiting ones, from April to June, and in October and November.

TYPE LOCALITY: Savannas d'Ibagué, basin of the Magdalena, Colombia, elevation 1,300 meters. Type collected by Triana, cited below.

DISTRIBUTION: Mexico, Guatemala according to Standley & Steyermark (56), Venezuela, Colombia, and Brazil, in llanos and fields, on rocky open limestone slopes at 20–1,300 meters elevation.

MEXICO: VERACRUZ: Zacuapan, *Purpus* 8031 (UC). Zacuapan, Fortin, *Purpus* 2048 (GH, US). Camarón, *Purpus* 11066 (US). OAXACA: TUXTEPEC: Chiltepec and vicinity, *Martinez-Calderón* 506 (A, US).

VENEZUELA: SUCRE: Between Cocollar and Guamal, *Steyermark* 62436 (F, isotype of *Melochia Humboldtiana* Steyermark, also US neg. 5671).

COLOMBIA: MAGDALENA: Santa Marta, *H. H. Smith* 484 (A, S, US). TOLIMA: Ibagué, Mariquita, *Triana* (P, type, also US neg. 5659; F fragment and neg. 23860 of type; W).

BRAZIL: Near border between Pará and Goiás, *Burchell* 9055 (GH). MATO GROSSO: Corumbá, *Malme* 3042 (S).

This species is usually characterized by a loose terminal inflorescence. The fruits usually develop in pairs and the leaves are subglabrous. It is close to *M. pilosa* (Mill.) Fawc. & Rendle, but the inflorescence is much more lax, the leaves are not as hairy, and the calyx is shorter. The fruits of *M. pilosa* are not in pairs.

Steyermark distinguishes his *M. Humboldtiana* from *M. kerriifolia* by slight differences in vestiture.

16. *Melochia argentina* R. E. Fries, Meded. Rijk. Herb. Leid. No. 19: 42. 1913.

Melochia argentina Hassl. Repert. Sp. Nov. Fedde 13:237. 1914.

Melochia argentina Hassl. var. *genuina* Hassl. Repert. Sp. Nov. Fedde 13:238. 1914.

Melochia argentina Hassl. var. *lanceolata* Hassl. Repert. Sp. Nov. Fedde 13:238. 1914.

A branched subshrub to shrub 0.6–2.5 meters high, the young stems hirsute in longitudinal lines, hairs simple, curved, 0.1–0.3 mm. long, internodes 1–3.5 cm. long; stipules 3.6–7.5 mm. long, 0.2–1.0 mm. wide, deltoid-acuminate to nearly linear, with few simple hairs, mostly ciliate, 0.1–0.3 mm. long; petiole 0.8–2.5 cm. long, vestiture similar to that of the young stems, but sometimes encircling the petiole.

Lamina 2.5–7.8 cm. long, 1.5–3.6 cm. wide, up to 9 by 4 cm. according to Hassler (24), usually ovate, also ovate-lanceolate to lanceolate, the base rounded, the apex acute to subacuminate, the upper surface subglabrous, hairs simple appressed, 0.1–0.6 mm. long on the midrib and sometimes present between the veins, the lower surface glabrous or with few simple appressed hairs 0.1–0.5 mm. long on the veins, the margin irregularly crenate-serrate, serrations relatively high, 2–8.5 mm. wide, 0.7–3.6 mm. high, 6–9 pairs of primary veins, 2 are basal.

Inflorescences axillary, 1–4.8 cm. long, at 1–14 upper nodes, rarely also terminating axillary branches 4–13.5 cm. long, the terminal inflorescence of a branch extending 3–4 cm. beyond the first leaf, the

ultimate divisions umbellate with 2 or 3 (3–6, Hassler) flowers per umbel, 1–4 umbels per inflorescence, the peduncle 0–3.3 cm. long, with a branch 0–0.5 cm. long, the pedicels 1–4 mm. long; bracts 1.3–3.7 mm. long, 0.2–0.5 mm. wide, deltoid-acuminate to acicular, mostly ciliate, hairs simple, 0.1–0.3 mm. long.

Calyx 5.5–7.5 mm. long, 4.7–5.8 mm. wide, not accrescent, mostly ciliate, hairs simple, 0.1–0.2 mm. long, the teeth 2.5–3.6 mm. long, 1.8–2.8 mm. wide, deltoid-acuminate or deltoid-acute, the sinus acute; petals yellow, 8.6–9.6 mm. long, 3.5–5.0 mm. wide, 10–12 by 5–7 mm. according to Fries, obovate-cuneate, the claw 0.5 mm. long, attached to the stamens for 0.5 mm.

Longistylous form not seen.

Brevistylous form. Difference in length of gynoecium and androecium not marked, stamens 4.8–5.6 mm. long, the filaments free for 0.5–1.5 mm., the anther 1.7–2.1 mm. long, 1.0 mm. wide, oblong, emarginate at both ends, almost to middle from the apex, pollen larger than average for the genus; pistil 4.2–5.1 mm. long, the styles free for 1.5–2.2 mm., united at the base, papillose at the apex for 0.7 mm., the ovary ovoid, hirsute, hairs simple and forked, 0.1–0.7 mm. long, stipe none.

Fruit 6.5–7.5 mm. long, 4.5–6.5 mm. wide, obtusely pentagonal, globose, acute to subacuminate at the apex, moderately deeply sulcate between the carpels, but the sulci extending less than half way to the center of the fruit, sparsely hirsute, hairs simple and forked, 0.2–0.5 mm. long, stipe none; dehiscence all along the ventral suture and one-third along the dorsal suture, also slightly septicial, but capsule not falling apart, several loose fibers about 1 mm. long along the ventral sutures; seeds 2.6–2.8 mm. long, 1.5–1.6 mm. wide, brown, sometimes with short white longitudinal markings.

Flowering specimens collected in October, November, and January to March; fruiting ones, in October, November, January, and February.

TYPE LOCALITY: Salta, Argentina, in moist places in the forest between Embarcacion and Miraflores. Type collected by Herzog, no. 1029, cited below.

DISTRIBUTION: Tarija, Bolivia to Cordoba, Argentina, in moist places in forests, thickets on hillsides, and in dry gravel of riverwash, at 650–1,700 meters elevation.

BOLIVIA: TARIJA: La Merced at Bermejo, *Fiebrig* 2190 (S).

PARAGUAY: Ibytymi, *Rojas* 13282 (S).

ARGENTINA: JUJUY: Cerro de Zapla, *Venturi* 5122 (US). LEDESMA: Sierra de Calilegua, *Venturi* 5348 (US). SAN PEDRO: About 17 km. SW. of San Pedro de Jujuy, *Eyerdam & Beetle* 22573 (GH). SALTA: Between Embarcacion and Miraflores, *Herzog* 1029 (L; S, type; F neg. 9598 ex B in US). Capital, *Schulz*

900 (S). ORÁN: Caraparí, *Bridarolli* 3267 (GH). Obra Grande, *Venturi* 5576 (S, US). TUCUMÁN: TAFI: Yerba Buena, *Venturi* 160 (US); *Wall* 12 (S).

This species is characterized by its rather large fruits, among the largest in the section *Mougeotia*, and very reminiscent of those in the section *Visenia*, by subglabrous leaves with high serrations, and by the nearly equal length of the gynoecium and the androecium.

From their descriptions and the fact that each cited *Stuckert* 12757 as belonging to his species, it is evident that Fries' and Hassler's species are the same. Hassler (24) separated *Melochia argentina* var. *lanceolata* Hassler from the type on the basis of the shape of the leaf. Since ovate and lanceolate leaves may occur on the same plant, I do not consider that, in this species, a variety based on the shape of the leaf is worthy of recognition.

17. *Melochia ulmifolia* Benth. in Hook. Journ. Bot. 4:129. 1841.

Riedleia ramuliflora Miq. Linnaea 19:132. 1847.

Riedleja dichotoma Turcz. Bull. Soc. Nat. Mosc. 31(1):208. 1858.

Melochia Benthami Schum. in Mart. Fl. Bras. 12(3):40, pl 7. 1886.

Melochia carthaginensis Willd. ex Schum. in Mart. Fl. Bras. 12(3):40. 1886.

Melochia ramuliflora (Miq.) R. E. Fries, Kgl. Svensk. Vet. Akad. Handl. 42(12):11. 1908.

A scrambling shrub to small tree 1.8–4.0 meters high, the young stems and petioles tomentulose, hairs stellate, 0.1–0.2 mm. long, the internodes 1.8–5.5 cm. long; stipules caducous, 1.7–2.5 mm. long, 0.2–0.6 mm. wide, deltoid-acuminate to nearly linear, hirsute on the abaxial surface, hairs 0.1–0.4 mm. long; petiole 1–3.1 cm. long, slightly broadened at the distal end.

Lamina relatively large, 5.0–14.0 cm. long, 2.0–8.2 cm. wide, ovate to oblong-ovate, the base rounded, truncate or subcordate, the apex acute to slightly acuminate, the upper surface green, with scattered, nonoverlapping, stellate hairs 0.1–0.2 mm. long on the veins and usually between them, the lower surface green, puberulous, velvety to the touch, hairs stellate, 0.2–0.3 mm. long, the margin irregularly crenate-serrate, serrations 2–4.5 mm. wide, 1–2.5 mm. high, 6–9 pairs of primary veins, 2 are basal, one more prominent than the other, prominent beneath.

Inflorescences axillary, at up to 8 upper nodes, up to 6 cm. long and 5 cm. broad, open, 3–8 flowers per umbel, 3–8 umbels at each axil, the peduncle 0.2–1.0 cm. long, sometimes with a primary branch 0.6 cm. long, and a secondary one 0.3–0.7 cm. long, the pedicel 1–5 mm. long; bracts 1–3 mm. long, 0.2–0.5 mm. wide, deltoid-acuminate to nearly linear, hirsute-tomentulose, hairs 0.1–0.3 mm. long; flowers very fragrant.

Calyx 4.3–6.1 mm. long, 3.7–5.7 mm. wide, campanulate, not accrescent, tomentulose, hairs forked and stellate, 0.1–0.6 mm. long,

the teeth 1.5–2.9 mm. long, 1.3–2.5 mm. wide, deltoid-acute, deltoid-acuminate to ovate, the sinus acute to somewhat rounded; petals white, yellowish white or yellow, 4.4–5.5 mm. long, 1.7–2.3 mm. wide, obovate to obovate-oblong, or oblanceolate, separate from one another and from the androecium, the blade rather sharply demarcated from the claw, claw 0.5–1.0 mm. long, hairs at the base of the adaxial surface of the blade 0.1–0.2 mm. long.

Longistylous form. Stamens 3.2–4.0 mm. long, the membrane between the filaments very thin, hairs near the base 0.6–0.8 mm. long or absent, the filaments free for 0.5–1.0 mm., the anther 0.8–1.2 mm. long, 0.7–0.8 mm. wide, oblong, emarginate at both ends; pistil 4.5–5.2 mm. long, the styles 2.7–3.7 mm. long, free to the ovary, hirsute at the base, papillose at the apex for 0.7 mm., the ovary oval to ovoid, hirsute mostly on its angles, hairs 0.5–1.0 mm. long, stipe none.

Brevistylous form. Stamens 5.5 mm. long, the filaments free for 3.5 mm., hairs at the base of the filaments 0.1–0.2 mm. long, the anther 1.1 mm. long, 0.6 mm. wide; pistil 3.0–3.5 mm. long, the styles free to the ovary, 1.7 mm. long, the ovary ovoid, hirsute, hairs up to 1.2 mm. long.

Fruit a capsule 5–6 mm. long, 4.8–5.5 mm. wide, nearly globular, mucronate at the apex, obtusely pentagonal, very shallowly sulcate between the carpels, hirsute-tomentulose, hairs 0.1–1.0 mm. long, the stipe 0.2–0.3 mm. long; dehiscence all along the ventral suture and 0.2–0.25 the way along the dorsal suture, only slightly septicial; seeds 1.9–2.4 mm. long, 1.1–1.2 mm. wide, trigonal, brown.

Flowering specimens collected in February, May, June, and from August to December; fruiting ones, in February, May, June, August, and from October to December.

TYPE LOCALITY: British Guiana, in savannas. Isotypes collected by Schomburgk, no. 203, cited below.

DISTRIBUTION: Santander, Colombia to Maranhão, Brazil, in second-growth thickets, along trails, on river banks, at the edge of clearings, in fields, on loamy soil, at 80–700 meters elevation.

FRENCH GUIANA: ?*Le Prieur* 302 (P). *Melinon* 166 (P), 277 (P), 487 (P). Banks of River Maroni, *Melinon* 210 (P), 229 (P, US); *Sagot* 1072 (P).

SURINAM: *Hostmann* 226 (US). *Hostmann & Kappler* 1047 (S, W, isotypes of *Riedleja dichotoma* Turcz.). Near Victoria station in region on way to Surinam River, *Kappler* 1695 (P, S). Near Blaauwe Berg, *Splitgerber* 890 (L).

BRITISH GUIANA: *Schomburgk* 203 (L, isotype). Orealla, Courantyne River, *Forest Dept.* 6753 (MICH, S).

VENEZUELA: BOLÍVAR: La Unión, Medio Caura, *Ll. Williams* 11235 (US).

COLOMBIA: SANTANDER: Vicinity of Puerto Araujo on Carare River, *Haught* 1705 (US). Between Nariño and El Tambor, *Killip & Smith* 14948 (US).

BRAZIL: RIO BRANCO: Furo do Cujubim, *Kuhlmann* 126 (US). AMAZONAS: Madeira, ?Itapisuiua, *Kuhlmann* 243 (RB). PARÁ: Baião, Tocantins, *Kuhl-*

mann 2093 (US). Rio Cupary, affl. do Tapajoz, *Kuhlmann* 1953 (US). Rio Erepecurú, *Sampaio* 4991 (R, US), 5567 (R, US). Marabá, *Pires* 4522 (US). Between S. João de Araguaya, S. Anna, *Burchell* 9264 (P). MARANHÃO: Tur-yassú, *Sneathlage* 272 (US). Fazenda do Rosario, *Lisboa* 55 (US).

Perhaps this species approaches most closely the section *Visenia* of Asia and the Pacific Islands in habit, leaves, inflorescence, and fruit. It is characterized by having hairs at the base of the petal blade, by open, branched, fairly large axillary inflorescences, by large leaves sparsely hairy on the upper surface, and by dehiscence of the fruit part way along the dorsal suture and the entire ventral suture. It is one of the largest species of the section *Mougeotia*.

Schumann (47) in monographing *Melochia* of Brazil considered *Melochia ulmifolia* St.-Hil. & Naud. and *Melochia ulmifolia* Benth., based on different types, to have been published in 1842. He retained the name for the former on the basis of page priority and renamed Bentham's species *Melochia Benthami*. However, as explained by Sprague (50), Bentham published his species in 1841 and therefore the name should be applied to his species. R. E. Fries (15) pointed out that Bentham's species had been described under the names *Riedleia ramuliflora* Miq. in 1847 and *Riedleja dichotoma* Turcz. in 1858. He proposed for it the new combination *Melochia ramuliflora* (Miq.) R. E. Fries. Since he admits that Bentham was the first to describe the species, his action is unacceptable.

18. *Melochia gardneri* Sprague, Kew Bull. 124. 1915.

PLATE 1

Melochia ulmifolia St.-Hil. & Naud. Ann. Sci. Nat. II, 18:36. 1842; non Benth. 1841.

A branched, erect, slender shrub 1.8–2.4 meters high, the young stems and petioles tomentulose, hairs stellate, average 0.2 mm. (0.1–0.7 mm.) long, internodes 1.3–3.4 cm. long; stipules 3.2–4.0 mm. long, 0.6–1.2 mm. wide, deltoid-acuminate, tomentulose and ciliate, hairs stellate and simple, 0.2–0.6 mm. long; petiole 0.7–2.4 (–3.5) cm. long.

Lamina rather thin, 5.7–8.8 (–12) cm. long, 2.8–5.0 (–6.8) cm. wide, ovate to ovate-lanceolate, the base rounded, the apex acute to acuminate, the upper surface green, sericeous, majority of hairs simple, fewer shorter, forked and stellate, 0.2–1.3 mm. long, the lower surface lighter green, tomentulose, soft to the touch, hairs stellate, a few simple, 0.2–0.7 mm. long, the margin irregularly crenate-serrate, serrations rather high, 0.8–3.6 mm. wide, 0.5–2.6 mm. high, 10–12 pairs of primary veins, 2 are basal.

Inflorescences terminal, sometimes also axillary, spicate, dense, extending 4–5 cm. beyond the first leaf, the axillary ones 1 cm. long, the pedicels 1–2 mm. long; bracts 3.5–5.7 mm. long, 0.5–0.7 mm. wide lanceolate, sericeous on dorsal surface and ciliate, longer hairs simple, shorter ones stellate, 0.2–0.7 mm. long.

Calyx 7–8.3 mm. long, 4.3–4.4 mm. wide, not accrescent, hairs most abundant on the junctures of the sepals, and ciliate, stellate, 0.1 mm., forked and simple, 0.5–1.2 mm. long, the teeth 3.5–4.5 mm. long, 2–2.2 mm. wide, deltoid-acuminate, the sinus acute; petals ?purple (dried), 11.6–12 mm. long, 2.5–3.1 mm. wide, up to 4 mm. wide according to Schumann (47), oblanceolate, the claw rather long, 3–4 mm. long, attached to the stamens for 2.7 mm.

Longistylous form. Stamens 4.9–5.9 mm. long, the filaments united up to the anthers, the anther 1.3–1.4 mm. long, 0.6–0.7 mm. wide, oblong, emarginate at both ends; pistil 11.1–12 mm. long, the styles free for 4–4.7 mm., united for 3.5–4.0 mm., the ovary globose, pentagonal-ovoid, the ovary and half of the free portion of the styles stellate tomentulose.

Brevistylous form not seen.

Fruit 7 mm. long, gradually aristate for about 1 mm., 4.6 mm. wide, globular-ovoid, obtusely pentagonal, pointed at the apex, shallowly sulcate between the carpels, tomentulose, stellate hairs 0.1–0.2 mm., forked hairs 0.4–0.7 mm. long, stipe none; dehiscence all along the ventral suture and a third along the dorsal suture, slightly septicial; seeds (not ripe) 2.5–2.8 mm. long, 1.5–1.8 mm. wide, brown, chalazal membrane 0.2–0.3 mm. long, almost winglike, 2 per cell.

Flowering and fruiting specimens collected in April.

TYPE LOCALITY: Brazil, Goiás, in woods on the Serra de Santa Brida. Type in Herbarium Delessert, collected by Gardner, no. 3608, isotype cited below.

DISTRIBUTION: Brazil, Goiás, in woods; also Piauí according to Schumann (47).

BRAZIL: GOIÁS: Serra de Santa Brida, *Gardner* 3608 (P, isotype, also US neg. 5665 ex P, and F neg. of type at G).

This species is characterized by its dense, unbranched terminal spike, rather large, thin, broad leaves, and comparatively large fruit for the section *Mougeotia*, dehiscent part way along the dorsal suture in addition to the entire ventral suture. It appears to be most closely related to *Melochia pilosa* (Mill.) Fawc. & Rendle.

As explained by Sprague (50), Bentham's *Melochia ulmifolia* was published prior to that of St.-Hilaire and Naudin. Sprague renamed the latter species *Melochia Gardneri* Sprague. In accordance with recommended practice, I have substituted the small "g" for the capital "G" in *Gardneri*.

19. *Melochia mollis* (H.B.K.) Triana & Planch. Ann. Sci. Nat. IV, 17:343. 1862.
Mougeotia mollis H.B.K. Nov. Gen. & Sp. 5:328. 1823.
Riedleia mollis (H.B.K.) DC. Prodr. 1:491. 1824.
Visenia mollis (H.B.K.) Spreng. Syst. 3:30. 1826.
Riedleia multiflora Presl, Rel. Haenk. 2:147. 1835.

Anamorpha melochioides Triana & Karst. in Triana, Nuev. Jen. i Esp. Fl. Neo-Granad. 10. 1854.

Melochia globifera Triana & Planch. Ann. Sci. Nat. IV, 17:342. 1862.

Usually a shrub, sometimes herb, erect, 0.5–5.0 meters high, the young stems and petioles densely tomentulose-villous, hairs brownish, stellate and usually also forked and simple, 0.1–2.0 mm. long, woolly to the touch, internodes 1.1–8.0 cm. long; stipules 3–8.5 (–10.0) mm. long, 0.7–1.8 (–3.8) mm. wide, deltoid-acuminate or deltoid-acute, lanceolate or ovate, tomentulose and sometimes ciliate, hairs stellate (short), forked and sometimes also simple, 0.2–1.5 mm. long; petiole 0.5–5.4 (–8.0) cm. long.

Lamina 3.7–13.5 (–22) cm. long, 2–8.8 (–10.5) cm. wide, broadly ovate to lanceolate-ovate, the base rounded to cordate, the apex acute to slightly rounded or slightly acuminate, the upper surface usually greenish, sometimes brownish due to the hairs, tomentulose, sericeous or with scattered hairs, velvety to the touch, hairs stellate (short) and sometimes also forked and simple, 0.2–1.5 mm. long, sometimes appressed, the lower surface tomentulose, velvety or woolly to the touch, hairs stellate, sometimes a few forked and simple, 0.2–1.2 mm. long, lighter green, or yellowish-tan canescent, the margin irregularly crenate-serrate, serrations 0.6–5.5 mm. wide, 0.4–3.0 mm. high, 7–11 (–15) pairs of primary veins, 2 (–3) are basal.

Inflorescences 2–10.5 cm. long, axillary in the upper 2–11 or more axils, rarely also terminal, in subcapitate umbels of 2–5 flowers, 4–6 umbels in an inflorescence, sometimes corymbiform or paniculate, the peduncle relatively thick, (0.2–) 0.5–8.0 cm. long, 0.5–1.5 mm. wide, sometimes with a primary branch 0.8–3.5 cm. long, and rarely a secondary one 1–1.5 cm. long, sometimes naked branches with peduncles at 4–5 nodes, the pedicels 1–4 (–8) mm. long; bracts 1–6.2 mm. long, 0.2–2.2 mm. wide, deltoid-acuminate to linear, tomentulose and sometimes ciliate, hairs stellate, forked, and simple, 0.1–1.4 mm. long.

Calyx 4–6.8 mm. long, 3.3–6.0 (–6.5) mm. wide, the teeth 1.7–4.6 mm. long, 1.2–2.7 mm. wide, deltoid to subovate, acute to acuminate, the sinus acute, sometimes accrescent, becoming 7–9.5 mm. long, 7.7–10.0 mm. wide, the teeth 4.5–5.5 mm. long, 3.5–5.5 mm. wide, densely tomentulose, canescent, hairs stellate (short) and sometimes also forked and simple, 0.2–1.0 mm. long; petals white to pale yellow or white distally and yellow proximally, 4.2–6.8 mm. long, 1.4–2.7 mm. wide, obovate, obovate-oblong, obovate-lanceolate, or oval, the claw 0.4–1.0 mm. long, free from the staminal tube or attached to it for 0.5 mm., sometimes 2 or 3 simple and forked hairs 0.1 mm. long just above the claw.

Longistylous form. Stamens 3.2–4.2 mm. long, the filaments united up to the anthers, sometimes tufts of hairs 0.4–0.5 mm. long

at the base of the staminal tube, alternate with the filaments, hairs 0.1 mm. long, the anther 1.0–1.3 mm. long, 0.5–1.0 mm. wide, oblong, emarginate at both ends, nearly to the middle from the apex, sacs slightly divergent at the apex; pistil 4.1–6.3 mm. long, the styles 2.6–4.0 mm. long, free to the ovary, filiform, slightly clavate and papillose at the apex for 0.7–1.0 mm., the styles and ovary densely tomentulose, hairs stellate and sometimes also simple, 0.2–0.3 mm. long, the ovary globose.

Brevistylous form. Stamens 4.3–5.4 mm. long, the filaments free for 1.5–2.5 mm., the anther 0.8–1.3 mm. long, 0.4–0.7 mm. wide, shape same as that above, staminode teeth 0.1–0.2 mm. long sometimes present; pistil 2.8–3.8 mm. long, the styles 1.2–2.2 mm. long, free to the ovary, papillose for 0.6 mm., base of the styles and the ovary densely tomentulose, hairs stellate, 0.1–0.3 mm. long.

Fruit 2.7–4.0 mm. long, 3.3–4.8 mm. wide, globose, obtusely pentagonal, slightly carinate along the midrib of the upper half of the carpels, the sulci between the carpels extending a fifth to a third the way to the center of the fruit, hirsute-tomentulose, hairs stellate, forked and simple, 0.1–0.3 (–0.5) mm. long, the stipe 0–0.6 mm. long; dehiscence septicidal into cocci open along the ventral suture, sometimes also a third to half way along the dorsal suture; seeds 1.7–2.4 mm. long, 0.9–1.5 mm. wide, trigonal, brown, 1 per cell.

Flowering specimens collected in January, March, May to October, and December; fruiting ones, in March, June to October, and in December.

TYPE LOCALITY: Honda and Santanna, Tolima, Colombia, at 234–720 meters elevation, isotype cited below.

DISTRIBUTION: Western Venezuela, Colombia, Ecuador, Peru, and western Bolivia, on open, wooded hillsides, in moist copse, along roadsides, desert stream bottom, dry grassy mountains, loam clearing, in full sun or semishade, at 234–2,100 meters elevation.

VENEZUELA: ZULIA: Perija, *Gines* 2148 (US).

COLOMBIA: Valle del Magdalena, *Karsten* s.n. (W). MAGDALENA: Santa Marta, *H. H. Smith* 733 (A, K, L, US); Vista Nieve, Santa Marta, *Viereck* 9 (US). NORTE DE SANTANDER: REGIÓN DEL SARARE: Hoya del río Chitagá, sobre La Cabuya, *Cuatrecasas et al.* 12198 (US). CUNDINAMARCA: On the río Bogotá in the vicinity of the bridge of San Antonio de Tena, *Cuatrecasas* 8280 (US). "Guayabetal" to Monte Redondo SE. of Quetame, *Pennell* 1753 (US), 1794 (US). Villeta, *Karsten* s.n. (W). Road between Villeta and Guaduas, *Ariste-Joseph*, July 1923 (US). El Colegio, *Ariste-Joseph* 1046 (US). Sasaima, *A. Marie* 21E (US). TOLIMA: Honda, *Bonpland* 1701 (P, isotype, presumably of *Mougeotia mollis* H.B.K.). *Andre* s.n. (K). F neg. 9606 ex B, *Humboldt & Bonpland*, presumably isotype of *Mougeotia mollis* H.B.K. (US). El Moral, Quindío, Mariquita, *Triana* (P, type of *Melochia globifera* Tr. & Pl., also US neg. 5663). "La Trinidad," Libano, *Pennell* 3249 (NY, US). TOLIMA?: La Vibora, Central Andes, *Lehmann* 4751 (US). HUILA: Cordillera Oriental, E. of Neiva,

Rusby & Pennell 445 (NY). ANTIOQUIA: Bello, *Bro. Thomas* 1011 (US); *Archer* 184 (US). VALLE DEL CAUCA: Rio Bolo, *Dryander* 752 (US). Rio Cali in the vicinity of Cali, *Ewan* 15853 (US). Quebrada Rio Yumbo, above Yumbo, *Ewan* 15839 (US). Espinal, below Dagua, *Killip & Hazen* 11063 (US). NARIÑO: Guaitara, *Karsten* s.n. (W). Pasto, *Karsten* s.n. (W).

ECUADOR: Eastern Cordillera, *Rimbach* 271 (US). TUNGURAHUA: Baños, *Tate* 623 (US).

PERU: In valleys of the Andes, *Haenke* s.n. (PR 174402 a, b, type of *Riedleia multiflora* Presl, also US neg. 5552). Pillao circa Chacahuassi, F. neg. 9603 ex B of *Ruiz*, collected in 1787 det.? HUÁNUCO: Cuchero, *Poeppig* 1269 in part (L, P, W). Near Cuchero, ?*Poeppig* 1379, September 1829 (W). Muña, *Macbride* 4005 (US) det.? JUNÍN: Huacapistana, *Sandeman* 4511 (K, also US neg. 5418), 4511A (K). San Ramón, *Killip & Smith* 24786 (W). AYACUCHO: Ccarrapa, between Huanta and Río Apurimac, *Killip & Smith* 22323 (US). CUSCO: CONVENCION: Hda. Sahuayaco, *Vargas C* 1685 (GH).

BOLIVIA: South Yungas, Sirupaya at Yanacachi, *Buchtien* 511 (US). Near Yungas, *Rusby* 1848 (NY, US).

This species is similar to *M. lupulina* Sw., but it is more robust, has longer and thicker peduncles and hairier stems and leaves, and the hairs are often brownish.

20. *Melochia colombiana* Cuatr. Rev. Acad. Colomb. Cienc. 8(32):486. 1952.

A branched, erect suffrutex at least 0.4 meter high, the young stems and petioles densely tomentose, hairs stellate 0.5–1.3 mm. long, light brown, internodes 0.4–0.7 cm. long; stipules 3.5–5.2 mm. long, 0.6–1.0 mm. wide, lanceolate, densely tomentose, hairs 0.3–1.0 mm. long; petiole 0.2–0.5 cm. long.

Lamina 1.1–3.8 cm. long, 0.7–2.0 cm. wide, ovate to nearly oval, the base rounded, the apex acute to slightly rounded, both surfaces densely tomentose, lanate, woolly to the touch, hairs tan, stellate and simple, 0.3–1.0 mm. long, the margin irregularly crenate-serrate, serrations 1–2.7 mm. wide, 0.5–2.0 mm. high, 8 or 9 pairs of primary veins, 2 are basal.

Inflorescences axillary, in upper 2–4 axils, 2.1–3.1 cm. long, the peduncle 1.2–1.6 cm. long, with branch 0.8 cm. long, the ultimate divisions umbellate, 5–10 flowers in a cluster, the pedicels 1.5–3.0 mm. long; bracts 1.5–3.0 mm. long, 0.2 mm. wide, lanceolate to nearly linear, densely tomentose, hairs 0.3–1.0 mm. long.

Calyx 5–5.7 mm. long, 4.8–5.3 mm. wide, not accrescent, densely tomentose on the outside, hairs stellate, 0.3–0.7 mm. long, the teeth 2.5 mm. long, 1.5–2.2 mm. wide, deltoid-acute, the sinus acute; petals yellow, 5 mm. long, 1.1–1.3 mm. wide, oblanceolate, the claw 0.5–0.6 mm. long, apparently free from the staminal tube.

Longistylous form not seen.

Brevistylous form. Stamens 4.5–4.9 mm. long, the filaments free for 1.5 mm., the anther 1.1–1.2 mm. long, 0.5–0.6 mm. wide, oblong, emarginate at both ends, nearly to the middle from the apex; pistil

3–3.5 mm. long, the styles filiform, stigmatic for 0.5 mm., 1.5 mm. long, free to the ovary, the ovary globose, densely tomentulose, hairs 0.3–0.5 mm. long.

Fruit 4 mm. long, 4.5 mm. wide, globose, pentagonal, the distal half of carpels somewhat carinate along the midrib, sometimes a slight hump about the middle of the dorsal surface of the carpels, the sulci extending a third to a fourth the way to the center of the fruit, densely tomentulose, hairs stellate, 0.3–0.6 mm. long, the stipe 0–0.3 mm. long; dehiscence septicidal into cocci open along the ventral suture, and sometimes a third along the dorsal suture; seeds 2.2–2.3 mm. long, 1.3 mm. wide, brown, 1 per cell.

Flowering and fruiting specimens collected in September.

TYPE LOCALITY: Colombia, Dept. del Valle, western slope of the Cordillera Occidental. Lobo Guerrero in xerophytic habitats, at 610–650 meters elevation. The type was collected by Cuatrecasas, no. 17804, and is cited below.

DISTRIBUTION: The species is known only from the type locality.

COLOMBIA: VALLE DEL CAUCA: CORDILLERA OCCIDENTAL: Lobo Guerrero, Cuatrecasas 17804 (F, type, also US neg. 5670).

This species is close to *Melochia mollis* (H.B.K.) Triana & Planch., but it has smaller laminae, shorter petioles, and shorter internodes.

21. *Melochia leucantha* Macb. Field Mus. Nat. Hist. Bot. Ser. vol. 13, pt. 3A
No. 2:625. 1956. PLATE 2

A branched, procumbent shrub 0.4–0.8 meter high, the young stems and petioles cinereous, tomentulose, hairs stellate, 0.1–0.3 mm. long, internodes 1–2.8 cm. long; stipules 2.8–6.0 mm. long, 0.7–1.5 mm. wide, deltoid-acuminate, tomentulose, hairs stellate, sometimes a few simple cilia, 0.1–0.7 mm. long; petiole 0.3–0.9 cm. long.

Lamina 1.7–4.0 cm. long, 1.0–3.2 cm. wide, broadly ovate, the base rounded to subcordate, the apex acute to rounded, velvety to the touch, the upper surface greenish-canescens-cinereous, tomentulose, hairs stellate, 0.1–0.3 (–0.4) mm. long, the lower surface canescens-cinereous, tomentulose, hairs stellate, 0.1–0.3 mm. long, the margin irregularly crenate-serrate, serrations 1.0–3.6 mm. wide, 0.3–1.8 mm. high, 5–9 pairs of primary veins, 2 or 3 are basal.

Inflorescences corymbiform to paniculate, the ultimate divisions umbellate, 3–10 flowers per umbel, in the axils of the upper 1–3 leaves, 2.5–6.5 cm. long, and terminal, extending 2.2–4.4 cm. beyond the first leaf, the peduncle 0.7–2.8 cm. long, the pedicels 1.5–3.0 mm. long; bracts 1–4.5 mm. long, 0.2–1.0 mm. wide, lanceolate to linear, tomentulose and sometimes ciliate, hairs stellate, 0.1–0.5 mm. long.

Calyx 5.9–6.3 mm. long, to 6.6 mm. long in the fruiting stage, 4.5–5.2 mm. wide, cinereous, densely tomentulose, hairs stellate, a few

forked, 0.1–0.5 mm. long, the teeth 3.1–4.0 mm. long, 1.5–2.3 mm. wide, deltoid-acuminate, the sinus acute; petals white, 6.8–7.2 mm. long, 2.0–2.8 mm. wide, obovate to nearly elliptic, cuneate, the claw 0.3–1.0 mm. long, free from the staminal tube or attached to it for 0.5 mm.

Longistylous form. Stamens 4.5–4.9 mm. long, the filaments united up to the anthers, the anther 1.4–1.6 mm. long, 0.8–0.9 mm. wide, oblong, emarginate at both ends, nearly to the middle from the apex; pistil 5.1–5.6 mm. long, the styles filiform, clavate and stigmatic at the apex for 0.7 mm., 3.1–3.4 mm. long, free to the ovary, the base of styles and ovary tomentulose, hairs stellate, few glandular, 0.1–0.2 mm. long, the ovary globose, pentagonal.

Brevistylous form. Stamens 5.5–6.0 mm. long, the filaments free for 2–2.3 mm., the base of staminal tube tomentulose for 1.3 mm. in tufts alternate with the filaments, hairs stellate 0.1–0.2 mm. long, the anther 1.2–1.4 mm. long, 0.5–0.6 mm. wide, oblong, slightly emarginate at both ends; pistil 3.7–4.2 mm. long, the styles filiform, papillose for 0.5–0.7 mm. at the apex, 2.1–2.5 mm. long, free to the ovary, the base of styles and ovary tomentulose, hairs stellate, 0.1–0.2 mm. long.

Fruit 3.8 mm. long, 3.9 mm. wide, globose, pentagonal, the angles somewhat acute, the sulci between the carpels extending a third of way to the center of the fruit, tomentulose, hairs mostly stellate, a few forked and simple, 0.1–0.3 mm. long, the stipe 0.5 mm. long; dehiscence septicial into cocci open along the ventral suture; seeds not quite ripe, 2.4 mm. long, 1.5 mm. wide, trigonal, brown, 1 per cell.

Flowering and fruiting specimens collected in March.

TYPE LOCALITY: Eight kilometers east of Mejorada, Huancavelica, Peru, in gravelly shrublands at 2,400 meters elevation. The type is Goodspeed Expedition No. 10908, collected by Stork & Horton, cited below.

DISTRIBUTION: Common, though not abundant, in shrubland from Cusco, Peru, westward, at 2,000–2,400 meters elevation.

PERU: HUANCVELICA: HUANCVELICA: Eight km. E. of Mejorada, *Stork & Horton* 10908 (UC, type, also US neg. 5616). TAYSCAJA: Valley of the Mantaro River below Colcabamba, *Weberbauer* 6438 (GH, US). AYACUCHO: *Soukup* 4014 (US). Macbride (30) also reports the species from Río Pachuchaca, Apurímac, Peru.

This species is close to *M. mollis* (H.B.K.) Triana & Planch., but differs by having a loose corymbiform inflorescence, rather than subcapitate clusters; the leaves of *M. mollis* are covered with longer, often simple and forked as well as stellate hairs, that are brownish rather than cinereous-canescenscent.

22. *Melochia lupulina* Sw. Prodr. Veg. Ind. Occ. 97. 1788.

Mougeotia inflata H.B.K. Nov. Gen. & Sp. 5:330, pl. 484. 1823.

Riedleia inflata (H.B.K.) DC. Prodr. 1:491. 1824.

Visenia inflata (H.B.K.) Spreng. Syst. 3:30. 1826.

Visenia lupulina (Sw.) Spreng. Syst. 3:31. 1826.

Riedleia melissaefolia Presl, Rel. Haenk. 2:149. 1835.

Melochia inflata (H.B.K.) Benth. Bot. Voy. Sulph. 71. 1844.

Riedleia lupulina (Sw.) Beurl, Vet. Akad. Handl. Stockh. 115. 1854 (1856).

Anamorpha waltherioides Triana & Karst. in Triana, Neuv. Jen. i Esp. Fl. Neo-Granad. 10. 1854.

Physocodon macrobotrys Turcz. Bull. Nat. Mosc. 31(1):213. 1858.

An erect herb to trailing suffrutex, often with several slender stems from the base, 0.45–3.6 meters long, the young stems hirsute-tomentose, hairs stellate, forked, simple, and sometimes glandular, 0.2–2 mm. long, internodes 2.5–7.0 cm. long; stipules 3.4–6.0 mm. long, 0.3–1.3 mm. wide, deltoid-acuminate, mostly ciliate, hairs 0.1–1.0 mm. long; petiole 0.7–6.7 cm. long, tomentose, hairs 1–2 mm. long.

Lamina 3–11.8 cm. long, 1.5–8.5 cm. wide, ovate, the base rounded to cordate, the apex acute to subacuminate, the upper surface green, hairs mostly simple, appressed, not much overlapping, sometimes a few stellate and forked, 0.2–1.5 mm. long, more numerous on the lower surface, which is subtomentose, hairs simple, forked, stellate, and sometimes glandular, 0.3–1.5 mm. long, the margin irregularly crenate-serrate, serrations 1–3 mm. wide, 0.6–2.0 mm. high, 7–11 pairs of primary veins, 2 are basal.

Inflorescences axillary, umbellate, clusters at upper 4–16 nodes, usually 2 or 3 clusters per axil, 2–9 flowers in a cluster, the peduncle short and slender, 0.1–0.7 cm. long, 0.3–0.5 mm. wide, the pedicel 1–5 mm. long; bracts 1.5–4.0 mm. long, 0.1–0.7 mm. wide, deltoid-acuminate to sublinear, mostly ciliate, hairs 0.1–1.5 mm. long.

Calyx membranous, greenish white, at anthesis 5.0–5.6 mm. long, 4.5–5.5 mm. wide, accrescent, becoming 8–12.3 mm. long, 12 mm. wide, densely tomentulose, hairs stellate, forked, and sometimes glandular, 0.2–0.5 mm. long, the teeth at anthesis 2.5–3.2 mm. long, 1.7–2.3 mm. wide, becoming 4.3–6.5 mm. long, 3.6–4.6 mm. wide, deltoid-acute to deltoid-acuminate, the sinus acute; petals usually white, sometimes yellowish white or white distally and yellow proximally, 4.5–7.2 mm. long, 1.6–2.1 mm. wide, obovate or oblanceolate, the blade rather sharply demarcated from the claw, claw 0.5–0.7 mm. long, apparently not attached to the staminal tube.

Longistylous form. Stamens 3.3–4.0 mm. long, the filaments united up to the anthers, the anther 1.0–1.2 mm. long, 0.6 mm. wide, emarginate at both ends, nearly to the middle from the apex, sacs divergent at the apex; pistil 4.5–5.8 mm. long, the styles 3.2–4.2 mm. long, free to the ovary, tomentose at the base, papillose at the apex

for 0.9 mm., the ovary subglobose, shallowly pentagonal, tomentulose, hairs 0.1 mm. long, the stipe 0.5 mm. long.

Brevistylous form. Stamens 4.2 mm. long, the filaments free for 2 mm., the anther 0.9–1.2 mm. long, 0.5–0.7 mm. wide; pistil occasionally of 6 carpels, 2.5 mm. long, the styles 1.5 mm. long, free to the ovary, papillose for 0.5 mm.

Fruit 2.5–3.2 mm. long, 2.9–4.3 mm. wide, globose, pentagonal, the sulci shallow, the cocci compressed, carinate, tomentulose, sometimes also glandular, hairs 0.1 mm. long, the stipe 0.5–0.7 mm. long; dehiscence septicidal into cocci, open along the ventral suture; seeds 1.7–2.2 mm. long, 1.1–1.3 mm. wide, trigonal, the sides flat, the dorsum rounded, brown.

Flowering and fruiting specimens collected throughout the year, but flowering most commonly from October to February.

TYPE LOCALITY: The type was collected by Swartz in Jamaica and is cited below.

DISTRIBUTION: Mexico, Central America, Jamaica, Venezuela, Colombia, Ecuador, and Peru, usually in moist thickets on shaded river banks, also in llanos, campo, savannas, and weedy fields, in loam or clay soil, at 0–3,150 meters elevation.

MEXICO: "In the land of western Mexico," *Haenke* (PR 174401 a, b, type of *Riedleia melissaefolia* Presl, also US neg. 5551). CHIAPAS: Vol. Tacana, Union, *Matuda* 2788 (MICH).

GUATEMALA: ALTA VERAPAS: *von Türckheim* II 2201 (US). Finca Mocca, *H. Johnson* 86 (US). Chicacoa, *J. D. Smith* 1764 (US). Near the Finca Sepacuite, *Cook & Griggs* 292 (US). Between Cahabon and Secanquim, *Goll* 129 (US).

BRITISH HONDURAS: El Cayo District, *Bartlett* 12888 (MICH, S), 11426 (MICH). El Cayo and vicinity, *Chanek* 206 (MICH). Vaca, *Gentle* 2267 (MICH).

HONDURAS: YORO: Quebrada Seca, *Standley* 53896 (US). EL PARAÍSO: Quebrada del Ingenio de los Angeles, *Standley* 29417 (US).

COSTA RICA: ?Salamanca, *Tonduz* 8613 (US). Between Barba and Santa Barbara, *Pittier* 1684 (US). Santiago, *Stork* 1246 (MICH). ?ALAJUELA: Alajuelita, *Tonduz* 1479 (US). SAN JOSÉ: Between Aserri and Tarbaca, *Standley* 34054 (US), 41343 (US). Las Vueltas, Tucurrique, *Tonduz* 12871 (GH, US, W). Vicinity of San José, *Tonduz* 10901 (US). Vicinity of El General, *Skutch* 2269 (S, US). CARTAGO: Vicinity of Pejivalle, *Standley & Valerio* 46802 (US). Rio Turrialba, *J. D. Smith* 6456 (US).

PANAMA: Porto-Bello, *Billberg* 292 (S). *Andersson* s.n. (S). Almerante, *Skutch* (US). Changuinola Valley along R. R., *Dunlap* 334 (US). Nature trail at Camp No. 1 on Madden Dam Highway, *Elmore* 58 (MICH). BOCAS DEL TORO: *Carleton* 183 (US). Water Valley vicinity of Chiriqui Lagoon, *von Wedel* 1671 (US), 1848 (US). CANAL ZONE: Gamboa, *Standley* 28329 (US), 28501 (US). Vicinity of Summit, *Standley* 25817 (US), 26932 (US), 29630 (US), 30059 (US). Hills W. of the Canal, near Gatún, *Standley* 27273 (S, US). Gatún, *Bro. Heriberto* 22 (US). Frijoles, *Standley* 27640 (US). Darien Station, *Standley* 31524 (US). Obispo, *Standley* 31772 (US). Empire to Mandinga, *Piper*

5460 (US). Pedro Miguel, *Piper* 5498 (US). Rio Grande, near Culebra, *Pittier* 2109 (US). Vicinity of Monkey Hill, *Cowell* 39 (US). PANAMÁ: N. of Panama City, *Bro. Paul* 613 (MICH). Rio Tapia, *Standley* 28053 (US). Between Matías Hernández and Juan Díaz, *Standley* 32063 (US). Matías Hernández, *Pittier* 6900 (US). DARIÉN: Along Sambú River, *Pittier* 5537 (US).

JAMAICA: *Swartz* s.n. (S, type, also US neg. 5615). Kempshot, *Harris* 10328 (US). Near Holland Bay, St. Thomas, *Harris* 11955 (S, US). Phillipsfield near Bowden, *Harris & Britton* 10783 (US). Along trail from Bath to Cuna Cuna Pass, *Maxon* 1691 (US). Sulphur River, near the Fountain, 1 mi. N. of Bath, *Mrs. K. L. Hart* s.n. (IJ). Cedar Valley, *Mrs. K. L. Hart* s.n. (IJ). Between Whitehall and Big Hill, *Proctor* 7674 (IJ). Gorge of Plantain Garden River NNW. of Whitehall, St. Thomas, *Proctor* 11783 (IJ); *Stearn* 485 (S).

VENEZUELA: MIRANDA: Las Mostazas on R.R. beyond Los Teques, *Allart* 206 (US), 285 (US). (These two specimens lead toward *M. mollis* [H.B.K.] Triana & Planch.)

COLOMBIA: *Dawe* 851 (US). BOLÍVAR: Rio Sinú, Cartagena, *Humboldt & Bonpland* 1369 (P, isotype of *Mougeotia inflata* H.B.K., F. neg. 35380 ex P [US], also US neg. 5660). Sincelejo, *Pennell* 4074 (US). Occidente de Monteria, near Rio Sinú, *Cervantes, Molina & Barkley* 19 Bo 053 (US). SANTANDER: Vicinity of Barranca Bermeja, Magdalena Valley, *Haught* 1533 (US). CUNDINAMARCA: Route de Villavicencio, Guyabetal, *Humbert et al.* 27146 (P, US). ANTIOQUIA: Vicinity of Medellín, *Barkley* 18 C 663 (US). CALDAS: Salamina, *Bro. Daniel* 2785 (US). VALLE DEL CAUCA: Guanabanal, *Killip* 6222 (US). "Potredillo" to "Miraflores," Palmira, *Pennell & Killip* 6063 (US). Cisneros, *Killip* 5368 (US), 35521 (US). CAUCA: *Karsten* s.n. (W, ?isotype of *Anamorpha waltherioides* Triana & Karst.). Piedra de Moler et Cartago, *Triana* s.n. (P, ?type of *Anamorpha waltherioides* Triana & Karst., also US neg. 5662).

EQUADOR: Balao, *Eggers* 14066 (L, US). Terecita, *Stevens* 143 (US). 21 km. SW. of Guayaquil, *Worth et al.* 8933 (US). Vicinity of Portovelo, *J. N. & G. Rose* 23438 (US). 8 km. N. of Guayaquil, *Stork et al.* 8974 (US). GUAYAS: Chongón, *Asplund* 5860 (R), 7683 (US). Rio Grande near Hacienda Tenguel, *Holmgren* 30 (S, US). Guayaquil and vicinity *Fagerlind & Wibom* 105 bis (S); *Hitchcock* 19934 (US); *Hartweg* 643 (W); *Jameson* 361 (LE, also US neg. 5270, isotype of *Physocodon macrobotrys* Turcz.). Oil camp between Guayaquil and Salinas, *Hitchcock* 20044 (US). Milagro, *Hitchcock* 20191 (US). Daule, *Fagerlind & Wibom* 371 (S). Near a tributary of Rio Daule 1.5° S. lat., *Boecher et al.* 39 (S). Los Rios: Near Quevedo, Canton Vinces, *Mexia* s.n. (US). CHIMBORAZO: Cañon of the Rio Chanchan near Huigra, *Camp E-2943* (US). CAÑAR: Valley of Rio de Cañar near Rosario, *Prieto* CP-21 (NY). EL ORO: Near junction of Rio Luis and Rio Ambocas, 10 km. S. of Portovelo, *Wiggins* 10892 (US).

PERU: *Haenke* s.n. (PR). SAN MARTÍN: Pucayacu 11 km. S. of Tarapoto, *Ferreyra* 7759 (US). LORETO: MAYNAS: Near Yurimaguas, *Poeppig* 2425 (P, W). Near Yurimaguas, at the River Huallaga, *Spruce* 3898 (W). LIBERTAD: Trujillo, *Killip & Smith* 21501 (US). Chicama Valley, *Smyth* 80 (US). LIMA: Lima and vicinity, *Savatier* 1658 (K), 1659 (K); *Née* s.n. (US); *Mathews* 1054 (W). Callao, insula S. Lorenzo, *Andersson*, Mar. 18, 1852 (S, US). Santa Clara, *Mr. & Mrs. J. N. Rose* 18735 (NY, US). Chosica, *Soukup* 1840 (US); *Macbride & Featherstone* 496 (US, W); *Asplund* 10897 (US). Ricardo Palma, *Reitz* 6016 (US). CHANCAY: Hda. Ana María, *Ferreyra* 7174 (US). HUÁNUCO: 15 mi. SE. of Huánuco, *Macbride & Featherstone* 2060 (US). JUNÍN: Colonia Perene, *Killip & Smith* 25064 (US).

Melochia lupulina Sw. can be distinguished from most members of the section *Mougeotia* by its markedly accrescent calyx. *Melochia mollis* (H.B.K.) Triana & Planch. may also have a markedly accrescent calyx, but it is more robust and usually taller than *M. lupulina*, 0.5–5 versus 0.45–3.6 meters high; *M. mollis* has longer and thicker peduncles, 0.5–8.0 cm. versus 0.1–0.7 cm. long, and it has hairier stems and leaves.

23. *Melochia thymifolia* (Presl) A. Goldberg, comb. nov. PLATE 3

Riedleia thymifolia Presl, Rel. Haenk. 2:149. 1835.

Melochia nervosa (should be *venosa*) Sw. *α typica* Schum. var. *purpurea* O. Ktze. Rev. Gen. 3(2):25. 1898.

Melochia yungasensis Rusby, Bull. New York Bot. Gard. 4:331. 1907.

Melochia pseudonodiflora Hochr. Ann. Cons. Jard. Genève 21:430. 1920.

A branched erect or decumbent subshrub 0.2–0.9 meter high, sometimes with numerous (to 10) slender stems from the base, the taproot woody, thicker than the stem, 0.4–0.8 cm. wide, sometimes with secondary branches, the young stems and petioles tomentulose, canescent, hairs stellate, simple and forked, sometimes also glandular, 0.1–0.2 (–2.0) mm. long, internodes 0.5–5.0 cm. long; stipules 2.1–6.0 mm. long, 0.5–1.8 mm. wide, lanceolate or deltoid-acute or deltoid-acuminate, ciliate, hirsute or tomentulose, hairs simple, forked, stellate, and sometimes glandular, 0.1–0.2 (–1.5) mm. long, petiole 0.2–1.6 (–3.1) cm. long.

Lamina (0.9–) 1.5–4.5 (–7.5) cm. long, (0.5–) 1.3–3.0 (–4.5) cm. wide, usually broadly to narrowly ovate, sometimes oblong-ovate, the base usually rounded, sometimes subcordate or truncate, the apex acute to rounded, the upper surface green, with slightly overlapping, simple, appressed hairs, or sericeous-tomentose, a few hairs stellate and forked, sometimes also glandular, or only stellate and forked, 0.1–0.2 (–1.5) mm. long, the lower surface lighter green, with scattered hairs or tomentulose and slightly canescent, hairs mostly stellate, some forked, usually also simple, sometimes also glandular, 0.1–0.2 (–1.0) mm. long, velvety or slightly scabrous to the touch, the margin irregularly crenate-serrate, serrations 0.7–3.7 (–6.9) mm. wide, 0.4–2.0 (–3.1) mm. high, (4–) 5–9 pairs of primary veins, (1–) 2 are basal.

Inflorescences on axillary branches 0.7–9.5 cm. long, leafless or with reduced leaves, the flowers at 1–4 nodes, in the axils of the upper 1–6 (–9) leaves of the main stem and 1–3 leaves of the branches, also terminal, extending 1–6 cm. beyond the first leaf, racemose, corymbiform or spicate, the ultimate divisions subcapitate umbels of (1–) 3–5 (–10) flowers, peduncles absent, especially from the inflorescences of the branches, or 0.2–4.0 cm. long, slender 0.4–0.7 mm. wide, the

pedicel 0.5–3.0 (–4.0) mm. long; bracts 1.0–5.5 mm. long, 0.2–1.1 mm. wide, linear, lanceolate, lanceolate-ovate, or deltoid-acute, ciliate and hirsute or tomentulose, hairs simple, forked, and stellate, 0.1–0.6 (–1.5) mm. long.

Calyx sometimes reddish or purplish in the fruiting stage, (3.5–) 4.0–4.9 (–6.0) mm. long, 3.0–5.2 mm. wide, sometimes slightly accrescent, becoming 4.5–6.8 mm. long and 4.8–5.7 mm. wide, the external surface with scattered hairs or tomentulose, hairs simple, forked, and stellate, sometimes predominantly glandular or only stellate, minutely canescent at the apex of the internal surface, hairs 0.1–0.3 (–1.0) mm. long, the teeth (1.5–) 2.2–2.9 (–4.0) mm. long, 1.2–2.0 (–2.9) mm. wide, deltoid- to ovate-acute or slightly ovate-acuminate, the sinus usually acute, sometimes rounded; petals rose or purple, sometimes white, 4.2–7.5 mm. long, 1.5–2.7 mm. wide, obovate, elliptic-oblong, or oblanceolate, cuneate, free from the stamens, the claw 0.3–1.2 mm. long.

Longistylous form. Stamens 2.4–3.5 mm. long, the filaments united up to the anthers, the anther 0.8–1.1 mm. long, 0.5–0.8 mm. wide, oblong, emarginate at both ends, nearly to the middle from the apex, sacs divergent at the apex; pistil 2.6–5.8 mm. long, the styles 1.3–3.4 mm. long, free to the ovary, papillose for 0.7–0.8 mm. at the apex, the ovary globular-ovoid, pentagonal, densely sericeous, hairs 0.1–0.8 mm. long.

Brevistylous form. Stamens 4.1–5.1 mm. long, the filaments free for 2.0–2.3 mm., the anther 0.8–1.1 mm. long, 0.5–0.6 mm. wide, shape same as that above; pistil 2.3–2.6 mm. long, the styles 1.3–1.7 mm. long, free to the ovary, the ovary globular, tomentulose-sericeous, or only hirsute at the apex, hairs 0.1–0.3 mm. long.

Fruit 2.6–4.5 mm. long, 3.0–4.5 mm. wide, globular, pentagonal, the carpels narrowing toward the apex, middorsal surface of carpels rounded at the base, keeled in the upper half, the sulci between the carpels extending one-fourth (one-fifth at the middle and one-third at the apex) of way to the center of the fruit, with scattered hairs or tomentulose, hairs simple, forked, and stellate, sometimes also glandular, 0.1–0.5 mm. long, the stipe 0–0.4 mm. long; dehiscence septicidal into cocci open along the ventral suture, and sometimes readily separated for a fourth to half way along the dorsal suture; seeds trigonal, 1.8–2.6 mm. long, 1.1–1.7 mm. wide, rarely the testa of the chalazal end is loosened for 0.1–0.2 mm. and almost winglike, brown, 1 per cell.

Flowering specimens collected in February, April, June, August, September, and November; fruiting ones, in June, September, and November.

TYPE LOCALITY: The lectotype was collected by Haenke, PR 174403a, in Huánuco, Peru, and is cited below.

DISTRIBUTION: In the Andes of Ecuador to Bolivia, on open hillside, on schistose rocks or red, sandy soil, usually at 2,400–2,700 meters elevation, but extending downward toward the Amazon basin.

ECUADOR: CHIMBORAZO: Vicinity of Huigra, mostly on the Hda. de Licay, *J. N. & G. Rose* 22546 (GH).

PERU: "Peru et Chili," *Ruiz* s.n. (G, type of *Melochia pseudonodiflora* Hochr., also US neg. 5416). **CAJAMARCA:** Tambillo, *de Jelski* 282 (W, also US neg. 5546).

AMAZONAS: Chachapoyas, *Mathews* 2115 (K), 3233 (K). **HUÁNUCO:** F neg. 9602 ex B of Ruiz, collected 1787 (US). "Peruvian Andes at Huanocco," *Haenke* (PR 174403 a and b, lectotype and isotype, respectively, also US neg. 5553). **AMBO:** Arriba de Quicacan, *Ferreya* 6631 (US). **JUNÍN:** Carpapata, above Huacapistana, *Killip & Smith* 24331 (US).

BOLIVIA: Yungas, *Bang* 1977 (NY, type; US, isotype of *Melochia yungasensis* Rusby). **LA PAZ:** *Bang* 2132 (GH). Cotaña at Illimani, *Buchtien* 254 (GH, NY), 3222 (NY, S, US). **LARECAJA:** Vicinity of Sorata, *Mandon* 819 (K, S, US). **COCHABAMBA:** Tunari, *Kuntze*, April 1892 (NY).

This species is close to *Melochia nodiflora* Sw., but the young stems and leaves are generally hairier; the number of nodes with inflorescences are fewer, 1–6 (–9) versus up to 20; a peduncle is often present, it is usually absent in *M. nodiflora*, and shorter when present; the pedicels are generally slightly longer, the terminal inflorescence is more frequent and longer, and the sulci between the carpels are shallower than in *M. nodiflora*.

This species is also related to *Melochia nudiflora* Standl. & L. Wms., but the leaves have fewer primary veins, 5–9 versus 9–14. The bracts are narrow, to 1.1 mm. wide, in *M. nudiflora* the majority are broad, to 3.9 mm. wide. The petals are free of the staminal tube but attached to it for 1–2 mm. in *M. nudiflora*.

This species is also close to *Melochia lupulina* Sw., but the calyx is not accrescent or slightly so, becoming 4.5–6.8 mm. long and 4.8–5.7 mm. wide, in *M. lupulina* it becomes 8–12.3 mm. long and 12 mm. wide. There is only one flower cluster per axil, frequently 2 or 3 in *M. lupulina*. The pedicels are generally shorter and the peduncle, when present, is usually longer than in *M. lupulina*.

24. *Melochia bernoulliana* Donn. Smith, Bot. Gaz. 35:2. 1903.

A branched, slender shrub 1–4 meters high, the young stems and petioles covered with stellate hairs less than 0.1 mm. long, internodes 2–6 cm. long; stipules deciduous, 3.5–5.0 mm. long, 0.6–0.8 mm. wide, lanceolate, with silky hairs up to 0.3 mm. long; petiole slender, 0.3–3.6 cm. long.

Lamina thin, 3–11.5 (–13) cm. long, 1.1–7.5 cm. wide, usually ovate, sometimes also lanceolate, the base usually rounded, some-

times truncate or subcordate, the apex usually acuminate, sometimes acute, the upper surface of young leaves with appressed, simple, deciduous hairs 0.1–0.5 mm. long on the blade, and stellate hairs less than 0.1 mm. long on the veins, the lower surface with stellate hairs less than 0.1 mm. long on the veins, the margin irregularly crenate-serrate, serrations high, 1–5 mm. wide, 0.5–3.5 mm. high, 7–11 pairs of primary veins, 2 are basal.

Inflorescence slender, somewhat paniculate, the ultimate divisions usually umbellate, 2–5 flowers per umbel, the terminal inflorescence extending 3–5 cm. beyond the first leaf, the axillary inflorescences 2–13 cm. long, in upper 5–10 axils, slender axillary flowering branches 9–13 cm. long, the peduncle 0–2.0 cm. long, very slender, the pedicels relatively long, slender, 3–7 mm. long; bracts 1–3.7 mm. long, 0.2–1.5 mm. wide, ovate to nearly linear, with simple, forked, and stellate hairs 0.1–0.4 mm. long.

Calyx 3.5–5.0 mm. long, 4–6.5 mm. wide, not accrescent, covered with stellate, simple and glandular hairs up to 0.1 mm. long, the teeth 2.1–3.8 mm. long, 1.4–2.2 mm. wide, deltoid- to ovate-acute to ovate-acuminate, the sinus acute to narrowly rounded; petals pink with white at the tips, or purple, 5–7.3 mm. long, 2.2–2.9 mm. wide, obovate to oblanceolate, attached to staminal tube for 1 mm., the claw 0–0.5 mm. long.

Longistylous form. Stamens 3.4 mm. long, the filaments united up to the anthers, the anther 1.0–1.1 mm. long, 0.7 mm. wide, oblong, emarginate at both ends, almost to the middle from the apex; pistil 4.8–5.0 mm. long, the styles 3.5–3.7 mm. long, free to the ovary, papillose at the apex for 0.8–1.0 mm., the ovary ovoid, hirsute-sericeous, hairs 0.5 mm. long, stipe none.

Brevistylous form. Stamens 2.8–4.0 mm. long, the filaments free for 1.3–2.7 mm., filamentous staminodes 0.4 mm. long sometimes present; pistil 2.7–3.1 mm. long, the styles 1.3–1.6 mm. long, free to the ovary, the ovary ovoid, hirsute, hairs forked, 0.3–0.5 mm. long.

Fruit obtusely pentagonal, depressed-globose, 3.5–4.1 mm. long, 4.4–4.8 mm. wide, with forked and simple hairs 0.1–0.5 mm. long and stellate hairs less than 0.1 mm. long, deeply sulcate between the carpels, the sulci extending half way to the center of the fruit, stipe none; dehiscence septicial into cocci open along the ventral suture; seeds 2.1–2.4 mm. long, 1.4–1.6 mm. wide, red brown.

Flowering and fruiting specimens collected from October to December (old fruit sometimes still present in March).

TYPE LOCALITY: Retalhuleu (Bernoulli & Cario 3112) and Santa Rosa (Heyde & Lux 4319), Guatemala; lectotype and paratype cited below.

DISTRIBUTION: Chiapas, Mexico, to San Vicente, Salvador, in moist or dry thickets, sometimes on cliffs or along streams, at 350–800 meters elevation.

MEXICO: CHIAPAS: Escuintla, *Matuda* 485 (MICH, US), 2129 (MICH).

GUATEMALA: RETALHULEU: *Bernoulli & Cario* 3112 (S, paratype). SANTA ROSA: Mouth of the Rio De Los Esclavos, *Heyde & Lux* 4319 (US, lectotype).

SALVADOR: SONSONATE: Near headwaters of Rio Acachapa, Hda. Las Tablos, Balsam Range, *Tucker* 1324 (US). LA LIBERTAD: Ateos, *Calderón* 1858 (GH, US). SAN VICENTE: Vicinity of San Vicente, *Standley* 21676 (US).

This species is characterized by its slender, open, somewhat paniculate inflorescences, long slender pedicels, and thin lamina with very short pubescence and high serrations. It is perhaps most closely related to *Melochia lupulina* Sw. but does not have an accrescent calyx.

25. *Melochia nodiflora* Sw. Prodr. Veg. Ind. Occ. 97. 1788.

Melochia carpinifolia Wendl. Bot. Beobacht. 52. 1798.

Mougeotia nodiflora (Sw.) H.B.K. Nov. Gen. & Sp. 5:330. 1823.

Riedleia nodiflora (Sw.) DC. Prodr. 1:491. 1824.

Visenia nodiflora (Sw.) Spreng. Syst. 3:30. 1826.

Riedleja urticaefolia Turcz. Bull. Soc. Nat. Mosc. 31(1):209. 1858.

Melochia conglobata Sessé & Moc. Pl. Nov. Hispan. ed. I, 106. 1889.

Melochia urticaefolia (Turcz.) Standl. Contr. U.S. Nat. Herb. 23:804. 1923.

An erect or spreading herb to slender, branched shrub 0.5–4.0 meters high, the taproot somewhat thicker than the stem, the young stems puberulous, hairs simple and forked, 0.1–0.2 (–0.6) mm. long, internodes 1.3–3.2 cm. long; stipules soon deciduous, 1.7–5.2 mm. long, 0.7–2.9 mm. wide, deltoid- to ovate-acute, hirsute-ciliate, hairs scattered, appressed, 0.2–0.8 mm. long; petiole 0.6–4.3 cm. long, hirsute-tomentose, hairs simple and forked, 0.4–1.0 mm. long.

Lamina 3.5–7.5 (2–11.9) cm. long, 1.5–5.3 (1.0–7.7) cm. wide, usually ovate, sometimes also ovate-lanceolate, the base rounded to cordate, or subtruncate, the apex acute, the upper surface green, subglabrate, a few scattered, simple, appressed hairs 0.1–0.7 mm. long, the lower surface green, subglabrate or puberulous, a few scattered simple, rarely also forked and stellate hairs, appressed or erect, 0.1–0.7 mm. long, the margin irregularly crenate-serrate, serrations 1.5–4.8 mm. wide, 0.7–2.0 mm. high, 7–10 pairs of primary veins, usually 2 are basal, the second pair thicker than the first.

Inflorescences axillary, in heads of 2–10 flowers at the upper 15–20 nodes, peduncle usually none, rarely 0.4–0.6 cm. long, sometimes naked axillary branches up to 7.5 cm. long with flowers at several nodes, the pedicel 0–2 (–3) mm. long; bracts 1.7–3.0 mm. long, 0.2–1.1 mm. wide, rarely wider and 2 united, deltoid-acute to deltoid-

acuminate or nearly linear, hirsute-ciliate, hairs simple, 0.3–0.7 mm. long.

Calyx sometimes dull red in the fruiting stage, 3.2–7.0 mm. long, 3–3.8 mm. wide, not accrescent, hirsute-ciliate, hairs simple and forked, 0.1–1.0 mm. long, the teeth 2–3 mm. long, 0.5–1.5 mm. wide, deltoid-acute to deltoid-acuminate or ovate-acuminate, the sinus acute; petals most commonly pink, also purplish, white with red or pink veins, pale pink with purplish-red veins, white, rarely yellow, 3.7–4.9 (–7.0) mm. long, 1.4–2.1 mm. wide, obovate, oval or elliptic, the claw 0–0.5 mm. long, base of petals shortly and loosely united to the staminal tube.

Longistylous form. Stamens 2.7–3.0 mm. long, the filaments united up to the anthers, the anther 0.7–0.9 mm. long, 0.4–0.6 mm. wide, oblong, emarginate at both ends, nearly to the middle from the apex, sacs slightly divergent at the apex; pistil 3.2–3.5 mm. long, the styles 1.3–2.0 mm. long, free to the ovary, papillose at the apex for 0.5 mm., the ovary ovoid or orbicular, hirsute, hairs simple, to 0.5 mm. long.

Brevistylous form not seen.

Fruit rarely of 6 carpels, 3.0–3.5 mm. long, 3.9–4.5 mm. wide, oblate-spheroid, pentagonal, the sulci between the carpels extending half way to the center of the fruit, hirsute, hairs simple, 0.4–1.0 mm. long, stipe none; dehiscence septicidal into cocci open along the ventral suture; seeds 2–2.2 mm. long, 1.1–1.4 mm. wide, trigonal, brown or tan.

Flowering specimens collected from August to April; fruiting ones, from July to May, both most commonly from November to February in the Northern Hemisphere.

TYPE LOCALITY: The type was collected by Swartz in Jamaica and is cited below.

DISTRIBUTION: Mexico to northern and eastern Brazil and the West Indies, in moist thickets, along the roadside, in cultivated ground, in waste ground, in sandy or open woods, in pastures, in wet or dry places on rocky, calcareous or sandy soil, at 0–1,800 meters elevation.

MEXICO: *Sessé et al.* (MA, type of *Melochia conglobata* Sessé & Moc.). F neg. 30510 ex MA of drawing of *M. conglobata* Sessé & Moc. (F). SINALOA: Imala, *Gentry* 4968 (GH). JALISCO: San Sebastian, Sierra Madre Mts., *Mexia* 1475 (A). VERA CRUZ: *Orcutt* 3168 (K, US). Zacuapan, Barranca de Santa Maria, *Purpus* 2358 (US). Rio de la Ternera, *Purpus* 8276 (US). Santa Lucrecia, *Mell* 667 (US). Cameron, *Purpus* 8630 (UC). MEXICO: TEMASCALTEPEC: *Hinton* 2072 (US). Chorrera, *Hinton* 5368 (US). Peñón, *Hinton* 2144 (US). Ixtapan, *Hinton* 2950 (MICH, S). MICHOACÁN: ZITÁCUARO: Zitácuaro-La Florida, *Hinton* 13407 (MICH, US). W. of Jiquilpan along highway to Colima, *McVaugh* 13207 (MICH, US). GUERRERO: Acapulco and vicinity, *E. Palmer* 261 in part (MICH, US). COYUCA: Coyuca-Chacamerito, *Hinton* 5689 (US). MINA: Manchon, *Hinton* 9640 (K, US). GALEANA: Plan de Carrizo,

Hinton 11024 (US). Oaxaca: Galeotti 4091 (W, isotype of *Riedleja urticaefolia* Turcz., also US neg. 5547). Vicinity of Cafetal Concordia, Morton & Makrinius 2706 (US), 2321 (US). Pochutla, Conzatti et al. 3021 (US), 3193 (US). YUCATAN: Izamal, Gaumer 948 (US). Chichankanab, Gaumer 2080 (MICH, US). Xno'caé, Gaumer & sons 23507 (S, US).

GUATEMALA: Hyde 631 (US). Gualan, Deam 267 (MICH). SANTA ROSA: Volcan Jumaytepeque, Heyde & Luz 4317 (US).

BRITISH HONDURAS: Prospecto, Northern River, Gentle 922 (MICH). Little Cocquericot, Belize River, Lundell 4235 (MICH).

HONDURAS: Vicinity of Amapala, Isla Tigre, Standley 20696 (US).

SALVADOR: Cerro del Guayabal, Calderón 1958 (US). Zacatecoluca, Calderón 329 (US). AHUACHAPÁN: Padilla 473 (US). Vicinity of Ahuachapán, Standley 20216 (US). SAN VICENTE: Volcán de San Vicente, Iglesias 1 (US). SAN MIGUEL: Hacienda San Antonio, Calderón 2121 (US). MORAZÁN: Easternmost peak, Montes de Cacaquatique, near summit on N. side, Tucker 630 (US). LA UNION: Grant 720 (MICH).

NICARAGUA: C. Wright s.n. (US). Granada, Baker 582 (US). Ometepe Island, Lake Nicaragua, Shimek & C. L. Smith 110 (US). MANAGUA: Chaves 31 (US). CHONTALES: Friedrichsthal 725 (W).

COSTA RICA: Around Nicoya, Tonduz 13489 (GH, US). Near Río Terraba, vicinity of Palmar Norte de Osa, Allen 5451 (MICH). GUANACASTE: Vicinity of Libano, Standley & Valerio 44906 (US). Vicinity of Tilarán, Standley & Valerio 45690 (US). Bebedero, Standley & Valerio 46685 (US).

PANAMA: Seemann 473 (S). Pearl Islands, Johansen 116 (US). Isthmus of Panama, Hayes 154 (GH). CHIRIQUÍ: Vicinity of San Carlos, Allen 1140 (US). CANAL ZONE: Balboa, Standley 25545 (US), 27126 (US), 29260 (US), 32112 (US). Near Summit, Standley 29649 (US). Vicinity of Miraflores Lake, White 260 (US). Along the old Las Cruces Trail, between Fort Clayton and Corozal, Standley 29149 (US). PANAMA: Vicinity of Panama, Macbride 2618 (US). Vicinity of Matías Hernández, Standley 28870 (US); Pittier 6905 (US). Between Matías Hernández and Juan Díaz, Standley 32092 (US). Between Las Sabanas and Matías Hernández, Standley 31847 (US). Bella Vista, Standley 25307 (S, US). Near Chepo, Hunter & Allen 61 (S).

BAHAMAS: NEW PROVIDENCE: Nassau, Curtiss 26 (L, US); Britton & Millspaugh 2087 (US).

CUBA: C. Wright 39 (US). de la Sagra 69 (W). Merat s.n. (W). Yumuny, Rugel 27 (L). Tumbadero, Otto 77 (W). PINAR DEL RÍO: Sierra de Anafe, Wilson 11490 (US). HABANA: Anafe near Lago de Ariguanabo, Ekman 1041 (S). Santiago de las Vegas, Wilson 3642 (UC, US). LAS VILLAS: Limones, Soledad, Cienfuegos, Pringle 84 (R, US); Jack 4622 (US), 6649 (S), 6895 (S, US). CAMAGUEY: Vicinity of La Gloria, Shafer 46 (US). ORIENTE: Vicinity of Baracoa, Pollard et al. 12 (US). Baracoa, at margin of Rio Toa, Ekman 4063 (S). Santiago de Cuba, Ekman 8467 (S), 8988 (S). Bayate, Ekman 4534 (S).

HAITI: Port-au-Prince, Eggers 3312 (S); Holdridge 1027 (MICH, US); Leonard 2801 (US). Vicinity of Port de Paix, ridge W. of La Coup River, E. C. & G. M. Leonard 11128 (US). Massif de la Hotte, Fond-des-Nègres, Ekman H7200 (S, US). Vicinity of Jean Rabel, E. C. & G. M. Leonard 12805 (US), 12632 (US). Dept. du Nord, vicinity of Plaisance, Leonard 9247 (US), 9286 (US). Vicinity of St. Michel de l'Atalaye, Leonard 7077 (US), 7729 (US), 8019 (US). Morne de l'Hôpital, ?Ticanda 1202 (S). Vicinity of St. Louis du Nord, E. C. & G. M. Leonard 14176 (US).

DOMINICAN REPUBLIC: C. Wright et al. 105 (US). von Türckheim 2579 (L, S, US). San Pedro de Macoris, Rose et al. 3713 (US). Azua, Rose et al.

4057 (US). SANTO DOMINGO: Vicinity of Ciudad Trujillo, *Allard* 13378 (US), 13400 (S, US), 13688 (US), 13696 (US), 14622 (US). Santo Domingo City, *Ekman* 10941 (S, US). BARAHONA: Riocito, *Fuertes* 199 (US).

JAMAICA: *Swartz* s.n. (S, type, also US neg. 5608). Upper slopes of Mount Diablo, *Maxon & Killip* 423 (US). Spanish Town, *Clute* 36 (US). Near Ewarton, *Harris* 6615 (US). Above Kingston, *Lehmann* B. T. 896 (L). GRAND CAYMAN: *Proctor* 9565 (IJ).

PUERTO RICO: *Krebs* s.n. (S). Sabana Grande, *Sargent* 470 (US). Rio Piedras, *Johnson & Stevenson* 1133 (US). Juana Diaz, *Sintenis* 2894 (L, US). Mayagüez, *Sintenis* 729 (L, S, US). Guayama, Jobas Road, *Goll* 508 (US). Mannabo-Guayama road, *Dale* s.n. (MICH). Bayamon, *Stahl* 850 (L, S). Between Cabo Rojo and San German, *Britton* 4307 (US). Arecibo, *Heller* 342 (US). Ponce, *Goll* 825 (US). Near Ponce on Adjuntas road, *Heller* 6059 (L, US). Aguadilla, *Heller* 4527 (L, US). Yauco, *Underwood & Griggs* 651 (US). VIEQUES ISLAND: Vicinity of Isabel Segunda, *Shafer* 2414 (US). CULEBRA ISLAND: *Britton & Wheeler* 41 (US).

LESSER ANTILLES: U.S. VIRGIN ISLANDS: ST. CROIX: Christiansted, *Rose et al.* 3566 (US). Bassin, *Ricksecker* 84 (L, US). ST. THOMAS: *Friedrichsthal* 29 (W); *Kuntze* ? 546 (US); *Eggers* s.n. (S), 98 (US), 97 (MICH), 261 (L, US); *Oersted* 30 (MICH, S, US). ST. JOHN: *Morrow* 160 (US). BRITISH VIRGIN ISLANDS: TORTOLA: *Fishlock* 15 (US). ST. BARTHÉLEMY: *Forsström* s.n. (S). ANTIGUA: *Box* 1249 dupl. (US). *Rose et al.* 3490 (US). MONTSERRAT: *Shafer* 646 (US). GUADELOUPE: *Forsström* s.n. (S). *Duss* 2670 (US). Moule, *Questel* 807 (US), 808 (US). Morne Miquel, *Questel* 448 (US). Ste. Marguerite, *Questel* 4280 ? (US). MARTINIQUE: *Sieber* 395 (L, PR, W). *Duss* 1361 (US). Fort de France, *H. & M. Stehle* 5734 (US).

TOBAGO: Scarborough, *Broadway* 2956 (L).

VENEZUELA: MIRANDA: Santa Lucía along Río Guaine, *Killip & Tamayo* 37015 (US).

COLOMBIA: MAGDALENA: Santa Marta, *H. H. Smith* 465 (L, S, US). ATLÁNTICO: Barranquilla and vicinity, *Bro. Elias* 332 (US); *Dugand* 5430 (US). Los Pendales at border of Dept. of Bolívar, *Dugand & Jaramillo* 4107 (US). Between Palmar de Varela and Ponedera on the banks of the Magdalena River, *Dugand* 4702 (US). Usiacuri, *Dugand & Barriga* 2367 (US). BOLÍVAR: Cartagena and vicinity, *Billberg* 35 (S), 202 (S); *Dahlin* s.n. (S); *Bro. Heriberto* 330 (US), 273 (US). Ternera, near Cartagena, *Bro. Angel* 772 (US). Vicinity of Turbaco, *Bro. Heriberto* 427 (US). Buenavista, E. of Since, *Pennell* 3986 (US).

BRAZIL: CEARÁ: *Allemão & de Cysneiros* 132 (R, US). Maranguape, *Drouet* 2259 (MICH, US). Serra de Maranguape, *Ule* 9067 (L). Maracanaú, *Ducke* 2607 (US). RIO DE JANEIRO: Cabo Frio, Restinga, *Glaziou* 10327 (P).

This species is characterized by its dense sessile clusters of flowers in the axils of numerous (15-20) leaves, and by its subglabrous leaves.

26. *Melochia nudiflora* Standl. & L. Wms. Ceiba 3:122. 1952.

A slender, branched, erect or subscandent shrub 0.9-4.0 meters high, the young stems and petioles tomentose, hairs yellowish brown, stellate, mostly 0.1-0.2 mm. long, forked and simple, 0.5-1.2 mm. long, internodes 1.7-9.0 cm. long; stipules soon deciduous, probably broad judging from the scar; petiole 0.2-3.0 cm. long.

Lamina 3–11 cm. long, 1.0–6.7 cm. wide, ovate to lanceolate, the base rounded to cordate, the apex acuminate to acute, the upper surface subsericeous, covered with appressed simple, and a few forked and stellate, nonoverlapping hairs 0.2–1.3 mm. long, the lower surface subcanescent, tomentulose-sericeous, hairs stellate, simple, and forked, 0.1–1.0 mm. long, both surfaces velvety to the touch, the margin irregularly crenate-serrate, serrations 0.8–3.2 mm. wide, 0.5–2.6 mm. high, 9–14 pairs of primary veins, 2 are basal.

Inflorescences axillary and terminal in subcapitate clusters of 2–15 flowers, the terminal inflorescence extending 1–14.5 cm. beyond the first leaf, with flowers at 1–6 nodes, the axillary inflorescences in the axils of 3–9 leaves, sessile, 1 cm. long, or on branches to about 8 cm. long, the pedicel 0–2 mm. long; bracts 2–6 mm. long, 0.6–3.9 mm. wide, the majority rather broad, suborbicular, ovate to lanceolate, the apex acute to rounded, several at the base of each flower, apparently 2 or 3 sometimes united nearly to the apex, hirsute and ciliate, hairs forked, simple, and stellate, 0.1–1.3 mm. long.

Calyx 4.5–6.4 mm. long, 3.5–5.0 mm. wide, not accrescent, tomentulose-sericeous on the external surface, hairs simple, forked, and stellate, 0.1–1.3 mm. long, tomentulose and canescent at the apex of the internal surface, the teeth 2.4–4.6 mm. long, 1.3–1.9 mm. wide, deltoid- to ovate-acuminate, the sinus acute to narrowly rounded; petals pink, 5.5–7.0 mm. long, 1.5–3.5 mm. wide, obovate-cuneate, attached to the staminal tube for 1–2 mm., the claw 0.7–2.0 mm. long.

Longistylous form. Stamens 3.5–4.0 mm. long, the filaments united up to the anthers, the anther 1.1–1.2 mm. long, 0.7–0.8 mm. wide, oblong, emarginate at both ends, nearly to the middle from the apex; pistil 5.1–5.7 mm. long, the styles 3.2–4.0 mm. long, free to the ovary, papillose at the apex for 0.7–1.0 mm., the ovary densely sericeous, hairs mostly simple, a few forked, 0.7–1.5 mm. long.

Brevistylous form. Stamens 5–5.5 mm. long, the filaments free for 1.7–3.0 mm., the anther 1.1–1.4 mm. long, 0.6–0.9 mm. wide, shape same as that above; pistil 3.0–3.5 mm. long, the styles 1.5–2.2 mm. long, free to the ovary, the ovary globular-ovoid, densely sericeous, hairs simple, 0.5–1.0 mm. long.

Fruit 3.2–4.4 mm. long, 4.5–5.1 mm. wide, obtusely pentagonal, oblate-spheroid, the sulci between the carpels extending a fourth to a third of way to the center of the fruit, hirsute- to sericeous-tomentose, hairs stellate (short), forked, and simple, 0.1–1.0 mm. long, stipe none; dehiscence septicial into cocci open along the ventral suture; seeds 2.3–2.6 mm. long, 1.6–2.0 mm. wide, trigonal, brown, 1 per cell.

Flowering specimens collected in September, October, December, January, and February; fruiting ones, in October, December, and February.

TYPE LOCALITY: The type, cited below, was collected by Williams and Molina, no. 11234, at Quebrada de Suyapa, Morazán, Honduras, at 1,200 meters elevation.

DISTRIBUTION: Mexico to Costa Rica, in thickets on rocky soil, on limestone hills, in dry forest, or in fields, at 750–1,700 meters elevation.

MEXICO: MORELOS: Cuernavaca, *Pringle* 7342 (MICH). MICHOACÁN: ARTEAGA: Fresnal, *Hinton* 15232 (US). GUERRERO: Near Iguala, *Pringle* 13509 (L, MICH, S). Mountains above Iguala, *Pringle* 8404 (US, W). Iguala Canyon, *Pringle* 10335 (R, S, W). Los Ametes Station, *Pringle* 13818 (MICH, US). CHIAPAS: Tuxtla Gutierrez, *Purpus* 9226 (GH, UC, US). Tuxtla, Hac. Petapa, C. & E. Seler 1953 (US).

GUATEMALA: Jacaltenanjo, *Nelson* 3587 (US). **GUATEMALA:** Near Amatitlán, *Standley* 61394 (MICH).

HONDURAS: MORAZÁN: Barranco de Suyapa, L. O. Williams & Molina R. 11234 (US, type and isotype).

COSTA RICA: Rodeo de Pacaca toward the River Yarris, *Pittier* 3228b (US).

This species is close to *Melochia nodiflora* Sw., but it has considerably hairier leaves and stems, generally broader bracts, and inflorescences on naked axillary branches much more commonly than *M. nodiflora*. The petals are usually larger than those of *M. nodiflora*.

27. *Melochia tragiifolia* Standl. Contr. U.S. Nat. Herb. 23:804. 1923.

A sparsely branched woody plant at least 0.5 meter high, the young stems densely covered with glandular hairs 0.2–0.5 mm. long, a few hairs simple and stellate, 0.2 mm. long, internodes 1.2–6.0 cm. long; stipules deciduous, 2.5–4.5 mm. long, 1.5–3.5 mm. wide, ovate, ciliate, hairs simple to 1.2 mm. long, and simple, forked, stellate, and glandular hairs 0.2–0.3 mm. long on the abaxial surface; petiole slender, 1–2 cm. long, pubescence similar to that of the young stems.

Lamina 3.3–5.2 cm. long, 2.0–3.2 cm. wide, ovate, the base cordate, the apex acute, the upper and lower surfaces green, covered with suberect mostly simple, and a few forked, stellate, and glandular hairs mostly 0.2 (0.1–0.5) mm. long, not overlapping, also ciliate, velvety to the touch, the margin irregularly crenate-serrate to dentate, the teeth 1.8–5.0 mm. wide, 0.5–2.5 mm. high, 7–9 pairs of primary veins, 2 are basal.

Inflorescences on slender axillary branches which are up to 7 cm. long, the flowers in the axils of 1–3 leaves or at up to 3 naked nodes, 3 or 4 flowers in subcapitate umbels at each node, the pedicels 0–3 mm. long; bracts similar to the stipules in size, shape, and pubescence, but sometimes only 1.0 mm. wide.

Calyx 5–6 mm. long, 3.2–4.2 mm. wide, not accrescent, hirsute-tomentose, hairs simple, forked, stellate, and glandular, 0.2–0.7 mm. long, the teeth 2.9–3.2 mm. long, 1.7 mm. wide, ovate, acute to sub-

acuminate, the sinus acute; petals reddish (dried), 8.0–8.2 mm. long, 2.4–3.2 mm. wide, obovate to oblanceolate, the claw 1 mm. long.

Longistylous form. Stamens 4.2 mm. long, the filaments united up to the anthers, the anther 1.3–1.4 mm. long, 0.6–0.9 mm. wide, oblong, emarginate at both ends; pistil sometimes consisting of 6 carpels, 6.1 mm. long, the styles 4.1 mm. long, filiform, clavate and papillose at the apex for 0.7 mm., free to the ovary, hirsute at the base, hairs 0.2 mm. long, the ovary broadly ellipsoid, pentagonal, hirsute, hairs forked and stellate, 0.2–0.6 mm. long.

Brevistylous form not seen.

Fruit 4.5 mm. long, 5.3 mm. wide, globose, obtusely pentagonal, the sulci extending a third of way to the center of the fruit, the midrib subcarinate above the middle of each carpel, covered with simple, forked, and glandular hairs 0.2–0.7 mm. long, the stipe 0.2 mm. long; dehiscence septicidal into cocci open along the ventral suture; seeds not quite ripe, 2.7–3.0 mm. long, 1.7–1.9 mm. wide, red brown, 1 per cell.

Flowering and fruiting specimen collected in March.

TYPE LOCALITY: La Salada, Michoacán, Mexico. The type was collected by Nelson, no. 6927, and is cited below.

DISTRIBUTION: The species is known only from the type locality.

MEXICO: MICHOACÁN: La Salada, *Nelson* 6927 (US, type).

This species is similar to *M. nodiflora* Sw. and *M. nudiflora* Standl. & L. Wms., but it differs in having an abundance of glandular hairs on the calyx and young stems and some on the leaves; the hairs of the latter two are not glandular. The petals are larger than those of *M. nodiflora* and the leaves are not as hairy as those of *M. nudiflora*.

28. *Melochia tomentella* (Presl) Hemsl. Biol. Centr. Amer. Bot. 1:132. 1879.

PLATE 4

Riedleia tomentella Presl, Rel. Haenk. 2:148. 1835.

A simple or branched, erect, perennial herb to shrub 0.6–2.0 meters high, the young stems and petioles densely tomentulose, hairs stellate, forked, simple, and sometimes also glandular, 0.1–0.3 mm. long, internodes 1.1–3.5 cm. long; stipules soon deciduous, 3.0–5.5 mm. long, 1.0–1.7 mm. wide, lanceolate, hirsute and ciliate, hairs simple, forked, and stellate, 0.1–0.5 mm. long; petiole 0.3–1.8 cm. long, very slender.

Lamina 3.0–9.0 cm. long, 1.2–3.9 cm. wide, lanceolate to ovate, the base rounded, the apex acute to long-acuminate, the upper surface covered with slightly overlapping simple and forked appressed hairs 0.1–0.8 mm. long, the lower surface covered, especially on the veins, with slightly overlapping stellate, forked, and simple hairs 0.1–0.6

mm. long, the margin irregularly crenate-serrate to crenate-dentate, serrations 1.5–6.8 mm. wide, 0.5–2.6 mm. high, 5–10 pairs of primary veins, 2 are basal.

Inflorescences in the axils of 4–12 upper leaves, the clusters sessile or subsessile, subcapitate, 0.7–2.3 cm. long, the peduncle 0–1 cm. long, the pedicel 0–2 mm. long, 2–5 flowers per umbel or head, sometimes also a terminal inflorescence extending 3.5 cm. beyond the first leaf; bracts numerous, 0.5–3.7 mm. long, 0.2–1.0 mm. wide, deltoid-acute to nearly linear, hirsute and ciliate, hairs mostly simple and forked, some stellate and fewer glandular, 0.1–0.7 mm. long.

Calyx 3.1–5.0 mm. long, 3.1–4.0 mm. wide, not accrescent, tomentulose, hairs stellate, forked, simple, and glandular, 0.2 (0.1–0.6) mm. long, the teeth 1.3–3.4 mm. long, 1.2–1.6 mm. wide, deltoid-acute to deltoid-acuminate, the sinus acute to slightly rounded; petals pink or white with pink veins, 5.5–7.8 mm. long, 2.1–3.0 mm. wide, obovate-cuneate, attached to the staminal tube for 1.7 mm., the claw 1.0–1.5 mm. long.

Longistylous form. Stamens 3.8 mm. long, the filaments united up to the anthers, the anther 1.3 mm. long, 0.7–0.8 mm. wide, oblong, emarginate at both ends, nearly to the middle from the apex; pistil 5.3–6.1 mm. long, the styles filiform, slightly clavate at the apex, papillose for 0.8 mm., 4.0–4.5 mm. long, free to the ovary, the ovary ovoid, densely sericeous, hairs 0.3–0.7 mm. long.

Brevistylous form. Stamens 4.8–5.0 mm. long, the filaments free for 2.0 mm., the anther 1.2–1.3 mm. long, 0.9 mm. wide, shape same as that above; pistil 3.6–3.8 mm. long, the styles filiform, papillose for 0.5 mm., 1.7–2.0 mm. long, free to the ovary, the ovary ovoid, densely sericeous-tomentose, hairs up to 0.8 mm. long.

Fruit 3.0–3.8 mm. long, 4.6 mm. wide, depressed-globose, obtusely pentagonal, the sulci between the carpels shallow, extending a third of way to the center of the fruit, densely tomentulose, hairs stellate, forked and simple, 0.1–0.7 mm. long, stipe none; dehiscence septicidal into cocci open along the ventral suture; seeds 2.2–2.6 mm. long, 1.3–1.5 mm. wide.

Flowering and fruiting specimens collected from September to December, and in February.

TYPE LOCALITY: The isotypes, cited below, were collected by Haenke at Acapulco, Mexico.

DISTRIBUTION: Mexico, in shady, short-tree forest bottoms, associated with mesquite, palms, and oaks, at 10–600 meters elevation.

MEXICO: SONORA: ALAMOS: Arroyo Cuchuhaqui, *Gentry* 862 M (MICH). Quiricoba, *Gentry* 833 M (MICH). SINALOA: Vicinity of Culiacan, *Brandege* s.n. (US). Falda del C. del Jacalito, San Ignacio, *Montes & Salazar* 565 (US). El Norote, *Ortega* 5884 (US). Imala, *Gentry* 4968 (MICH). Rio Fuerte, *Gentry* 943M (MICH). SINALOA?: Ymala, *E. Palmer* 1669 in 1891 (MICH, S, US).

DURANGO: La Bajada, Tamazula, *Ortega* 4322 (US). GUERRERO: Acapulco, *Haenke* s.n. (PR 174404 a-e, isotypes, also US neg. 5548); *E. Palmer* 261 in part 1894-95 (MICH, US). GALEANA: Atoyac, *Hinton* 10908 (MICH, US). Bagueta, *Langlassé* 495 (US). Sierra Madre del Sur, N. of Rio Balsac, Adama, Temisco, Barranca del Consuelo, *Mexia* 8782 (S). OAXACA: JAMILTEPEC: From Collantes to Para Verde, *Conzatti* 4427 (US). From Jamiltepec to Rio Verde, *Nelson* 2375 a (US). Huatulco, *Liebmann* 588-0 (L, US), 11881 fragment (US).

This species is close to *Melochia nodiflora* Sw., but the leaves are usually lanceolate rather than ovate, and acuminate rather than acute, and the stems and leaves are hairier.

Section III. *Melochia*

Section *Riedleia* Griseb. Fl. Brit. W. Ind. 94. 1859.

Perennial or annual herbs to shrubs, 0.2-2 meters high, the taproot not thicker than the base of the stem or 2-3 times thicker, and 0.8-2.0 cm. wide, the young stems subglabrous to cinereous, hirsute, pilose, sericeous or tomentose, hairs stellate, sometimes also forked, simple or glandular, 0.1-3.2 mm. long; internodes 0.3-10.0 cm. long; stipules 1.5-10.0 mm. long, 0.2-3.2 mm. wide, usually lanceolate, deltoid-acuminate or linear, often ciliate, subglabrous to tomentulose, hairs simple, sometimes stellate, forked, and glandular, 0.1-2.7 mm. long; petiole 0.07-6.2 cm. long.

Lamina 0.7-10.5 cm. long, 0.2-8.5 cm. wide, ovate, lanceolate, linear, oblong-ovate, or suborbicular, the base usually rounded, sometimes subcordate, truncate or cuneate, the apex usually acute, sometimes acuminate or rounded, both surfaces glabrous to canescent, hairs simple, appressed, or stellate, forked, and glandular, 0.1-1.0 (-2.2) mm. long, the margin irregularly crenate-serrate, serrations 0.3-12 mm. wide, 0.2-2.5 mm. high, 4-13 pairs of primary veins, usually 2 are basal.

Inflorescences terminal, extending 1-34 cm. beyond the first leaf and axillary, 0.7-19 cm. long, or only terminal or axillary, subcapitate, spicate or paniculate, rarely corymbiform, the peduncle short, 0-1.9 (-4.1) cm. long, the pedicels usually short, 0-9 (-14) mm. long; bracts often long, 0.5-12.2 mm. long, 0.1-1.9 mm. wide, frequently 3 immediately subtending each flower, sometimes 2 united at the base, similar in shape and pubescence to the stipules.

Calyx usually short, 1.4-6.0 mm. long, 2.0-5.0 mm. wide, sometimes membranous, hirsute, sericeous or tomentulose, hairs simple, forked, stellate, or glandular, 0.1-2.3 mm. long, the teeth short, 0.4-2.7 mm. long, 0.2-2.2 mm. wide, the sinus usually rounded to nearly truncate, rarely acute, the teeth often distant; petals white to pink, blue, lilac, violet, purple distally and yellow proximally, red, red striped, yellow or orange, 2.7-12.7 mm. long, 0.8-5.2 mm. wide, usually obovate or

oblanceolate, cuneate, free of the staminal tube or attached to it for 0.3–2.0 (–3.0) mm., the claw 0.2–1.5 (–4.0) mm. long; anther 0.4–1.7 mm. long, 0.3–0.9 mm. wide, oblong, emarginate at both ends, nearly to the middle from the apex, staminodes rarely present, 0.2–0.4 mm. long.

Longistylous form. Stamens 2.6–6.2 mm. long, the filaments united up to the anthers; pistil 3.6–9.0 mm. long, the styles free for 1.5–6.0 mm., to the ovary, or united for 0.5–3.0 mm., papillose for 0.7–2.5 mm. at the apex.

Brevistylous form. Stamens 4.7–8.0 mm. long, the filaments free for 1.7–4.3 mm.; pistil 2.3–6.2 mm. long, the styles free for 1.0–3.8 mm., to the ovary, or united for 0.3–1.8 mm., papillose for 0.7–0.8 mm. at the apex; the flowers of several species not dimorphic, stamens and pistils 1.7–3.2 mm. long, the filaments free for 0–1.2 mm., the styles free for 0.6–1.2 mm., to the ovary, or united for 0.1–0.3 (–0.7) mm.

Fruit 2.4–5.0 mm. long, 3.2–5.5 mm. wide, globular, pentagonal, the sulci between the carpels shallow, extending a fifth to a fourth of way to center of the fruit, often hirsute-tomentulose, hairs simple, sometimes also forked, stellate, or glandular, 0.1–1.5 mm. long, stipe usually none, rarely 0.2–1.0 mm. long; dehiscence all along the dorsal and ventral sutures, tardily septicial, the fruit falling apart; seeds 1.4–3.2 mm. long, 1.0–1.9 mm. wide, trigonal, brown to black, usually 1 per cell.

The flowering and fruiting periods are usually long, sometimes throughout the year.

TYPE SPECIES: *Melochia corchorifolia* L.

DISTRIBUTION: United States to Argentina, West Indies, Africa, Asia, Pacific Islands, adventive elsewhere in savannas, thickets, or fields, in wet or dry habitats, at 0–2,300 meters elevation.

29. *Melochia villosa* (Mill.) Fawc. & Rendle, Fl. Jamaica 5:165. 1926. PLATE 5

Usually a perennial, sometimes annual, erect, spreading, decumbent or procumbent, usually branched herb, sometimes suffrutex, rarely a small frutex, sometimes with two to several slender shoots from near the base, 0.3–2.0 meters high, the root as thick as the base of the stem, sometimes 2–3 times thicker and 0.8–2.0 cm. wide, the young stems with a large pith, sometimes hollow, hirsute, villous, lanate, sericeous or tomentose, hairs sometimes ferruginous, tan or golden, simple, forked, glandular, sometimes stellate in longitudinal lines, sometimes predominantly stellate all around the stem, 0.1–2.0 (–2.5) mm. long, internodes (0.3–) 0.6–6.5 cm. long; stipules (2–) 4.2–9.5 mm. long, (0.3–) 0.6–1.7 (–3.1) mm. wide, deltoid- or ovate-acuminate or lanceolate, rarely sublinear or oblong, hirsute-tomentose or seri-

ceous, ciliate, hairs simple, sometimes also forked, stellate, and glandular, 0.1–2.0 mm. long; petiole 0.1–6.2 cm. long, pubescence similar to that of the young stems.

Lamina 1.5–10.5 cm. long, 0.9–8.5 cm. wide, the basal laminae sometimes smaller, usually ovate, sometimes oblong-ovate, lanceolate or suborbicular, the base usually rounded to subcordate, sometimes cordate or truncate, the apex usually acute, sometimes rounded, the upper surface green and subglabrous to hirsute, villous, sericeous, or tomentose and tan-canescens, hairs simple, sometimes also a few forked and stellate, or entirely stellate, rarely as many as 10–12 rays per hair, 0.2–2.0 mm. long, the lower surface green and subglabrous or tan- or ferruginous-canescens, and sericeous or tomentose, hairs simple, glandular, sometimes also forked and stellate or entirely stellate, 0.1–2.0 mm. long, sometimes both surfaces velvety or woolly to the touch, the margin irregularly crenate-serrate, serrations 0.6–4.1 mm. wide, 0.2–2.0 mm. high, (4–) 5–12 pairs of primary veins, usually 2 (–3) are basal, the second pair stronger, veins prominent beneath.

Inflorescences predominantly terminal, usually spicate, sometimes subcapitate, usually coarctate, sometimes lax, extending 1.0–33.5 cm. beyond the first leaf, the flowers at 2–28 nodes, usually 1–5 (–15) flowers at a node, the internodes 0.1–3.0 cm. long, also axillary, 0.7–1.0 cm. long, at 1–6 nodes, rarely flowers at nodes not subtended by leaves on the middle portion of the stem or the terminal inflorescence interrupted by leaves at about 3 nodes, peduncle usually none, sometimes 0.1 cm. long, pedicels none or very short, 0–1.6 mm. long; bracts usually long, 3.5–11.0 mm. long, 0.3–1.0 (–2.5) mm. wide, deltoid-acute to deltoid-acuminate, ovate-lanceolate or lanceolate to sublinear, sometimes subfalcate, 2 or 3 subtending the abaxial side of each flower, merely touching or united at their very base, usually one more below, ciliate and hirsute, sericeous or tomentose, hairs simple and sometimes glandular, forked, or stellate, 0.2–2.0 mm. long.

Calyx 3–6 mm. long, 3–5 mm. wide, hirsute, sericeous or tomentose, sometimes ciliate, hairs simple, sometimes also forked, stellate, or glandular, 0.1–2.0 mm. long, the teeth 0.8–2.5 mm. long, 0.4–2.1 mm. wide, deltoid- to ovate-acute or ovate-acuminate, the sinus acute to rounded and the teeth then rather distant; petals usually pink or purple, sometimes violet, blue, rarely yellow, white, white distally and yellow proximally, or white with pink stripes, 6.0–12.7 mm. long, 1.9–4.5 mm. wide, usually obovate-cuneate, sometimes oblanceolate-cuneate, attached to the stamens for 1.5–3.0 mm., the claw 1–3 mm. long.

Longistylous form. Stamens 3.5–6.2 mm. long, the filaments united up to the anthers, scattered simple, sometimes also forked, hairs 0.1–0.3 mm. long on the tube, the anther 1.1–1.7 mm. long, 0.5–0.9 mm. wide, oblong, emarginate at both ends, nearly to the middle from the apex, sacs slightly spreading at the apex; pistil 5.7–9.0 mm. long, the styles free for 3–5 mm., united for 0.7–1.7 (–2.7) mm., papillose at the apex for 1.8–2.5 mm., the ovary ellipsoid, ovoid or globular, the ovary, particularly the apex, and base of styles rather densely sericeous-tomentose, hairs simple, sometimes also forked and stellate, 0.4–1.5 mm. long, stipe none.

Brevistylous form. Stamens 6–8 mm. long, the filaments free for 2.0–3.4 mm., glabrous or with scattered hairs 0.1–0.2 mm. long, the anther 1.0–1.7 mm. long, 0.5–0.9 mm. wide, shape similar to that above; pistil sometimes consisting of 6 carpels, 3.8–5.2 mm. long, the styles free for 1.5–2.2 mm., united for 0.8–1.5 mm., papillose for 0.8 mm., the ovary ovoid or globular, densely sericeous, hairs 0.5–1.5 mm. long.

Fruit 3.0–3.3 mm. long, sometimes a rostrum 1 mm. long present, 3.4–3.9 mm. wide, globular, slightly depressed, obtusely pentagonal, the sulci between the carpels very shallow, extending a fifth to a fourth of way to the center of the fruit, hirsute-tomentulose, mostly near the apex, hairs simple, sometimes also forked and stellate, 0.1–1.5 mm. long, stipe none; dehiscence loculicidal, first all along the dorsal, then along the ventral suture, tardily septicial, the fruit falling apart; seeds trigonal, 1.7–2.2 mm. long, 1.1–1.7 mm. wide, reddish brown, usually 1 per cell.

Flowering and fruiting specimens collected throughout the year. According to Gray (20) anthesis is matutinal.

Key to Varieties of *M. villosa*

1. Leaves and stems tomentose or villous-tomentose, tan- or ferruginous-canescant, hairs predominantly or exclusively stellate.
29c. *M. villosa* var. *tomentosa*
1. Leaves and stems hirsute-sericeous to subglabrous, hairs predominantly or exclusively simple.
 2. Internodes of terminal inflorescence usually short; bracts typically 1.5 mm. wide; stems not pubescent in 2 longitudinal lines.
29a. *M. villosa* var. *villosa*
 2. Internodes of terminal inflorescence long; bracts often up to 2.5 mm. wide; stem pubescent in 2 longitudinal lines (Minas Gerais, Brazil).
29b. *M. villosa* var. *regnellii*.

29a. *Melochia villosa* (Mill.) Fawc. & Rendle var. *villosa*

Sida villosa Mill. Gard. Dict. ed. 8. 1768.

Melochia hirsuta Cav. Diss. 6:323, pl. 175, fig. 1. 1788.

Riedlea serrata Vent. Choix. 37, pl. 37, 1803.

Mougeotia hirsuta (Cav.) H.B.K. Nov. Gen. & Sp. 5:331. 1823.

- Riedleia hirsuta* (Cav.) DC. Prodr. 1:492. 1824.
Melochia lilacina St.-Hil. Fl. Bras. Merid. 1:162. 1825.
Visenia hirsuta (Cav.) Spreng. Syst. 3:30. 1826.
Visenia serrata (Vent.) Spreng. Syst. 3:30. 1826.
Riedleia serrata Vent. β *glabrescens* Presl, Rel. Haenk. 2:147. 1835.
Riedleia elongata Presl, Rel. Haenk. 2:148. 1835.
Melochia vestita Benth. in Hook. Journ. Bot. 4:130. 1841.
Melochia serrata (Vent.) St.-Hil. & Naud. Ann. Sci. Nat. II, 18:36. 1842.
Melochia Clinopodium St.-Hil. & Naud. Ann. Sci. Nat. II, 18:36. 1842.
Melochia densiflora Miq. Linnaea 22:800. 1849.
Riedleja Cubensis Turcz. Bull. Soc. Nat. Mosc. 31(1):209. 1858.
Riedleja Jurgensenii Turcz. Bull. Soc. Nat. Mosc. 31(1):211. 1858.
Riedleja heterotricha Turcz. Bull. Soc. Nat. Mosc. 31(1):211. 1858.
Riedleja tenella Turcz. Bull. Soc. Nat. Mosc. 31(1):212. 1858.
? *Riedleja scutellarioides* Turcz. Bull. Soc. Nat. Mosc. 31(1):210. 1858.
Melochia jurgensenii (Turcz.) Hemsl. Biol. Centr. Amer. Bot. 1:131. 1879.
? *Melochia scutellarioides* (Turcz.) Hemsl. Biol. Centr. Amer. Bot. 1:131. 1879.
Melochia tenella (Turcz.) Hemsl. Biol. Centr. Amer. Bot. 1:131. 1879.
Melochia cephalodes Schum. in Mart. Fl. Bras. 12(3):45. 1886.
Melochia hirsuta Cav. var. *grandiflora* Schum. in Mart. Fl. Bras. 12(3):46. 1886.
Melochia hirsuta Cav. var. *rotundifolia* Schum. in Mart. Fl. Bras. 12(3):46. 1886.
Melochia hirsuta Cav. var. *glabrata* Schum. in Mart. Fl. Bras. 12(3):47. 1886.
Melochia hirsuta Cav. var. *glabrescens* (Presl) Gray Syn. Fl. N. Am. 1(1):340. 1897.
Melochia hirsuta Cav. var. *paraguayensis* Chod. Bull. Herb. Boiss. II, 1:403. 1901 (as var. *paraguagensis*).
Riedlea glabrescens (Presl) Small. Fl. SE. U.S. 780. 1903.

The leaves of the typical variety are hirsute-sericeous to subglabrous and not canescent.

TYPE LOCALITY: Jamaica. Miller's type is in the herbarium of the British Museum.

DISTRIBUTION: Southern Florida, Jalisco and Veracruz, Mexico to Paraguay and São Paulo, Brazil, the Greater Antilles, primarily in savanna and pineland, but also in various other habitats, in wet or dry clay, sandy, loam, or serpentine soil, at 0–2,300 meters elevation.

UNITED STATES: "California ad Monte-Rey" *Haenke* s.n. (PR 24355, type of *Riedleia elongata* Presl, also US neg. 5549). The locality is probably incorrect; it is probably somewhere in Mexico. FLORIDA: Near Trabue?, *Simpson* 393 (US). South Florida, *A. W. Chapman* s.n. 7754 (US). LEE: Fort Myers and vicinity, *Hitchcock* 26 (US); *P. C. Standley* 12615 (US), 12961 (US), 18964 (US); *J. P. Standley* 235 (US), 300 (US); *Buswell* 1358a (S). Near Okaloacoochee Slough, Big Cypress, *Small* 8292 (US). Alva, *Francis* 96 (US). Caloosa River, *Garber* 47 (S, US); *Curtiss* 370 A (US), A (S, US). Caloosahatchee, *D. Chapman* s.n. (US). HENDRY: La Belle, *Brass* 15468 (US). HIGHLANDS: Bootheel Creek, Venus, *Brass* 20562 (US).

MEXICO: *Haenke* (W). La Laja, *Liebmann* 588 K (US), 11875 (US), 11877 (US). Sierra San Pedro Nolasco, Talea, etc., *Jurgensen* 506 (K, isotype of *Riedleja tenella* Turcz., also US neg. 5414). Passo-Majo, *Wawra* 816 (W).

NAYARIT: About 21 mi. SE. of Tepic, *Gentry* 18343 (US). JALISCO: Guadalajara, Tequila, *E. Palmer* 287 in 1886 (US). Lowlands near Guadalajara, *Pringle* 4452 (MICH, S, US, W). VERACRUZ: Mirador, *Sartorius* s.n. (W). Zacuapan, *Purpus* 12071 (US), 2028 (US), 10877 (US). Xalapa, *Coulter* 793 (GH). Cuiclahuac, *Matuda* 1443 (MICH). SAN ANDRÉS TUXTLA: Between Los Mangos and San Juan de Azúcar, *Dressler & Jones* 205 (US). MEXICO: TEMASCALTEPEC: Cerro Muñeca, *Hinton* 1372 (US). Ixtapan, *Hinton* 1643 (S, US). MICHOACÁN: Coalcoman, *Hinton* 12206 (US). GUERRERO: GALEANA: Moreno, *Hinton* 14343 (MICH, US). Montes de Oca: Vallecitos, *Hinton* 11371 (US). OAXACA: Near Santo Domingo, *Nelson* 2706 (US). Rincón Antonio, *Orcutt* 3271 (GH, US). From Cordoba to Santa Lucrecia, *Conzatti* 1716 (US). About 2 km. E. of Zantepec, *King* 1877 (US). CHIAPAS: Chicomuselo, *Matuda* 4430 (US). Acapetagua, *Matuda* 16684 (MICH). Near the junction of Rio Perlas and Rio Jataté at San Quintin and near Laguna Miramar, *Sohns* 1647 (US).

GUATEMALA: Los Amates, *Deam* 121 (MICH). PETÉN: Big Fall Pine Ridge, *Lundell* 4185 (S). La Libertad and vicinity, *Lundell* 2301 (MICH), 2389 (MICH), 2612 (MICH); *Aguilar H.* 172 (MICH). Sabana Zotz, *Lundell* 3582 (MICH). HUEHUETENANGO: Cerro Victoria, across the river from Finca San Rafael, Sierra de los Cuchumatanes, *Steyermark* 49569 (US). ALTA VERAPAZ: Cubilgüitz, *Türkheim* 7615 (US), II 49 (S). Cajabon near Finca Sepacuite, *Cook & Griggs* 330 (US). Between Cajabon and Secanquim, *Goll* 108 (US). Chamá, *Johnson* 836 (US). Rútzul, between Cajabon and Lanquin, *Goll* 120 (US), 131 (US), 132 (US). IZABAL: Cristina, *Blake* 7568 (US). SANTA ROSA: Las Viñas, *Heyde & Lux* 6074 (US). Rio de las Cañas, *Heyde & Lux* 3953 (US).

BRITISH HONDURAS: *Record* s.n. (US). Honey Camp, Coastal Region, *Lundell* 585 (US). Maskall Pine Ridge, *Gentle* 1044 (MICH, S). Butcher Burn, Sibun River, *Bartlett* 11413 (MICH, S), 11384 (MICH). All Pines, *Schipp* 549 (MICH, S). Belize River, *Lundell* 4185 (MICH). Near Manatee Lagoon, *Peck* 297 (GH). BELIZE: Baker's Pine Ridge, *Lundell* 3793 (MICH). TOLEDO: Swasey Branch, Monkey River, *Gentle* 3771 (MICH).

HONDURAS: COPÁN: Hac. Espiritu Santo to Quebrada Majanales, *Blake* 7463 (US). COMAYAGUA: Vicinity of Siguatepeque, *Standley* 56272 (US); *Yunker et al.* 5540 (MICH, S).

SALVADOR: MORAZÁN: About 1.6 km. SE. of Divisadero, *Tucker* 580 (US).

NICARAGUA: Slopes of Mt. Mombacho, near Granada, *Grant* 758 (GH).

COSTA RICA: Hac. "La Argentina," Grecia, *Valerio* 600 (US). Buenos Aires, *Tonduz* 4028 (US). Infiernillo cerca de Juan Viñas, *Tonduz* 10416 (US). Boruca, *Pittier* 4583 (US). Rodeo, *Pittier* 1647 (US). Las Cóncavas, near Cartago, *Cooper* 13 (US); *Lankester* 323 (S); *Stork* 2145 (MICH). Paraiso Cartago, *Torres* 101 (US), 191 (US).

PANAMA: CHIRIQUÍ: San Carlos, *Roy* 4 (MICH, US). Sabana de la Tortuga, between El Boquete and Caldera, *Pittier* 3304 (US). Vicinity of Boquete, *W. L. Stern et al.* 1175 (US). COCLÉ: Aguadulce, *Pittier* 4858 (US). CANAL ZONE: Along the old Las Cruces Trail, between Ft. Clayton and Corozal, *Standley* 29087 (US). Chiva-Chiva Trail, Red Tank to Pueblo Nuevo, *Piper*, 5757 (US). PANAMÁ: Sabanas and vicinity, *Bro. Paul* 74 (US); *Standley* 25845 (US), 25934 (US); *Bro. Gervais* 159 (US); *Killip* 3122 (US). Río Tapia, *Standley* 28300 (US). Near Río Tapia, Juan Díaz, *Maxon & Harvey* 6632 (S, US). Between Matías Hernández and Juan Díaz, *Standley* 28897 (S, US), 31980 (US). Matías Hernández, *Pittier* 6797 (US), 6875 (US). Sabana de Juan Corso, near Chepo, *Pittier* 4510 (US). Along the road between Panamá and Chepo, *Dodge et al.* 16660 (S). Nuevo San Francisco, *Standley* 30748 (US). Near the big swamp E. of the Río Tecumen, *Standley* 26506 (US).

CUBA: *Poeppig* s.n. (S). *de la Sagra* s.n. (W). Laguna los Piedras, ?*Poeppig*, collected 1824 (W). S. Cristobal, *C. Wright* 2086 (S, US), 2088 (S, US). ISLE OF PINES: *Taylor* 94 (US). Near Nueva Gerona, *Curtiss* 218 (L, US); *W. Palmer & Riley* 867 (US); *Killip* 42538 (US). Near Managua, *W. Palmer & Riley* 1079 (US). Las Tunas, *Britton & Wilson* 14745 (US). Santa Ana, *Ekman* 12206 (S). PINAR DEL RÍO: Pinar del Río, Pinar del Cajalbana, *Ekman* 10438 (S). Arroyo del Sumidero, *Shafer & Bro. Leon* 13567 (US). Palm barrens W. of Guane, *Shafer* 10418 (US), 10645 (US). N. of San Diego de los Baños, *W. Palmer & Riley* 630 (US). El Guama, *W. Palmer & Riley* 129 (US). S. of Las Mangas, *Ekman*, 13060 (S). Between Candelaria and Artemisa, *Wilson* 1716 (UC). LAS VILLAS: Near Santa Clara, *Howard* 5600 (US). CIENFUEGOS: Cieneguita, *Combs* 217 (US). CAMAGUEY: Sierra Cubitas to Santa Rosa, *Shafer* 548 (US). ORIENTE: Sierra Maestra at Pinar de Caridad, SE. of Yara, *Ekman* 14685 (S).

HAITI: DEPT. DU NORD: Vicinity of Dondon, *Leonard* 8649 (US). MASSIF DU NORD: Le Borgre, Poste Marie Congo, *Ekman* H. 4844 (S, US). Massif de la Hotte, western group, Corail, at Dutreuil, *Ekman* H. 10745 (S).

DOMINICAN REPUBLIC: Loma Mata Clara, *Eggers* 2336 (L, US). La Nassa, *Faris* 135 (US). La Leonor, *J. S. Jiménez* 2407 (US). SANTA DOMINGO: Vicinity of Ciudad Trujillo, *Allard* 14237 (US), 14232 (US). Sabana de Santa Rosa, *Allard* 15892 (US), 15942 (US), 16023 (US). MOCA: Villa Altagracia, *Ekman* H. 11230 (S, US). DUARTE: 33 km. de la Carretera, *J. Jiménez* 821 (US). Valle de Cibao, Pimentel, *Ekman* H. 13239 (S). LA VEGA: Sierra Prieta, *J. S. Jiménez* 1148 (US). TRUJILLO: Vicinity of Piedra Blanca, *Allard* 13503 (US), 13831 (S, US), 18896 (US). PACIFICADOR: Villa Riva (Almacén), *Abbott* 536 (US), 626 (US). SEIBO: Vicinity of Higüey, *R. A. & E. S. Howard* 9874 (US). Guarabo, SE. of Jovero, *Abbott* 2762 (R, S, US), 2820 (US).

JAMAICA: *W. Wright* s.n. (W). Oxford, *Harris* 9428 (US). CLARENDON: Clarendon Park to Four Paths, *Britton* 3788 (US). James Hill Savanna, *Harris* 12842 (US). Kellits, *Harris* 11151 (US). Hollis' Savanna, *Harris* 12251 (S, US). HANOVER: Orange Bay Morass, *Macfadyen* s.n. (S).

PUERTO RICO: *Sintenis* 5922 (US). *Goll* 43 (US). *Stahl* 350 (L). Near Cabo-Rojo at Port Real, *Sintenis* 162 b (L, US, W). Near Santurce, *Heller* 251 (US), 4671 (US); *Coules* 158 (US). Moca, *Sargent* 248 (US). Rio Piedras, *Stevenson* 112 (US). Sabana Abajo, near Carolina, *Britton & Brown* 5712 (US). Bayamón, *Underwood & Griggs* 865 (US). Along the road to Rosario, Las Mesas, *Theoslohn* 219 (GH).

TRINIDAD: PIARCO SAVANNAH: *Broadway* 2132 (US); *Warming* 262 (US). S. of Arouca, *Britton et al.* 58 (US). S. of Dabadie, *Britton & Hazen* 695 (US).

FRENCH GUIANA: *Le Prieur* 129? (L). Cayenne and vicinity, *Broadway* 152 (US), 608 (US); *Sagot* 55 (S, W). Maroni, *Melinon* 45 (US).

SURINAM: Bergendaal, *Focke* 359 (L). Epereroe, *Pulle* 495 (L, US).

BRITISH GUIANA: *Schomburgk* 133 (W, syntype of *Melochia vestita* Benth., also F neg. 35388 ex. P). Between Takutu River and Kanuku Mts., *A. C. Smith* 3267 (S, US). RUPUNUNI: 45 mi. N. of Lethem, *Irwin* 835 (US).

VENEZUELA: SUCRE: Cumana, Guanaguana, *Funck* 170 (LE, isotype of an unnamed variety of *Riedleja heterotricha* Turcz.). Los Altos, *Tamayo* 2163 (US). ANZOÁTEGUI: Bajos del Rio Tigre, in Cristovero, SE. of San Tomé, *Pittier* 14595 (US). Rio Caris near El Tigre, *Pittier* 14321 (US). ARAGUA: Colonia Tovar, *Fendler* 1935 (GH). Above Guamitas, *Ll. Williams* 10356 (US). Valle de Guamitas, Parque Nacional, *Pittier* 15251 (US). CARABOBO: Near San Joaquin, *Pittier* 8007 (US). TRUJILLO: Near La Ceiba, *Reed* 949 (US). ZULIA: Vicinity of Mene Grande, *Pittier* 10575 (GH, US). APURE: Puerto Paez, *Velez* 2724 (US).

BOLÍVAR: Morichal Santa Isabel, *Cardona* 660 (US). Calcetas en la Pica de El Cristo, *Cardona* 1020 (US). Rio Aprada afluente del Uriman, Caroni, Guayana, *Cardona* 2002 (US). GRAN SABANA: Cercanias de Santa Elena, *Tamayo* 3215 (US). ?BOLÍVAR: Camarata Valley, *Simpson* 66 (US). AMAZONAS TERR.: Maypures, *Spruce* s.n. (K).

COLOMBIA: *Linden* 887 collected 1842 (W). MAGDALENA: La Jagua, *Haught* 3648 (US). ?MAGDALENA: Queremal Jagua, *Arbeláez* 3010 (US). NORTE DE SANTANDER: Ocaña, *Schlim* 94 (P). REGION DEL SARARE: El Barco, *Cuatrecasas* 13174 A (US). SANTANDER: SAN GIL: Hacienda de La Mesita, *Langenheim* 3312 (US). CUNDINAMARCA: Paimo, *Bro. Ariste-Joseph* A802 (US). Melgar, *Pennell* 2918 (US). Ibama, E. of Yacopi, *Grant* 9143 (US). El Colegio, *Schneider* 928 (S). META INT.: Villavicencio and vicinity, *Apiay*, *Humbert & Fernandez* 27182 (P), 27193 (P); *Jaramillo et al.* 293 (US). E. Mico Airstrip, E. savanna before Rio Guejar, *Philipson et al.* 1316 (US). Boca de Monte, Llanos de San Martin, *S. G. Smith & Idrobo* 1438 (US). ARAUCA: RIO CASANARE: Esmeralda, *Cuatrecasas* 3959 (US). (This specimen approaches *M. villosa* var. *tomentosa*). VAUPÉS: Caño Cuduyari, *Cuatrecasas* 7225 (US). Rio Vaupés, at Mitu, *Humbert & Fernandez* 27211 (P, US). TOLIMA: Mariquita and vicinity, *Garcia Barriga* 8128 (US); *Pennell* 3659 (US). W. of San Lorenzo, *Pennell* 3459 (US). HUILA: Cordillera Oriental, E. of Neiva, *Rusby & Pennell* 476 (US). N. of Neiva, upper basin of Rio Magdalena, *S. G. Smith* 1120 (US). San Augustin, *Bro. Daniel* 4132 (US). One km. SW. of San Antonio Fortalecillas, *Fosberg* 19833 (US). ANTIOQUIA: Medellín, *Archer & Aguilar* 702 (US). VALLE DEL CAUCA: Rio Bolo, *Dryander* 337 (US). Palmira, *Pennell & Killip* 6045 (US). Timba, *von Sneidern* 1268 (S, US), 1185 (S). Samaria, 2 km. W. of Timba, *Fosberg* 20522 (US). CAUCA: El Tambo, *Idrobo & Fernandez* 123 (US). Jamundi, Cauca Valley, *Pittier* 1508 (US). Aganche, *Pennell & Killip* 8318 (US).

ECUADOR: "Yapio cerca Quilichao," *Jameson* s.n. (US). Cañar, *Rose et al.* 23793 (US).

PERU: SAN MARTÍN: San Roque, *Ll. Williams* 7102 (S, US); *Melin* 123 (S). Tarapoto, *Ll. Williams* 6149 (S); *Ule* 6528 (L). Zepelacio, near Moyobamba, *Klug* 3705 (S, US). Rioja, *Woytkowski* 6084 (US).

BOLIVIA: BENI: Lake Rogagua, *Cardenas* 1628 (US). SANTA CRUZ: SARA: Buena Vista, *Steinbach* 6943 (S), 5104 (A).

BRAZIL: Martii Herb. Fl. Bras. 582 (L). *Pohl* s.n. (W). Pirapora, Independencia, *Burret et al.* 10104 (R). Western part, *Tamberlik* s.n. (W). RIO BRANCO: Serra Pellada, *Ule* ?7634 (L). AMAZONAS: São Gabriel, Rio Negro, *Holt & Blake* 625 (RB, US). Rio Içana, Tunuí, *Black* 48-2597 (US). PARÁ: Vicinity of Santarem, *Spruce* June 1850 (W). Almeirim, Rio Arayollos, *Ducke* s.n. (RB). PIAUÍ: *Gardner* 2488 (US, syntype of *Melochia vestita* Benth.). BAHIA: *Glocker* 425 d(S). *Blanchet* 1588 (W). Jacobina, *Blanchet* 3663 (P, US, W, also US neg. 5666 ex P). Serra do S. Antonio, F neg. 9599 ex B of *Sello* 1935, syntype of *Melochia cephalodes* Schum. (US). MINAS GERAIS: Lassance-Pirapora, *Cochran* s.n. (R, US). Corinto, *Mexia* 5530 (S, US). Rio Arassuahy, *Glaziou* 12460 (R). Morro de Caxambú, *Glaziou* 15849 (R). São Sebastião do Paraíso, *Brade & Altamiro* 45 (R). Lagoa Santa, *Hoehne* 6140 (R). S. João d'El Rey, Casa da Pedra, *Armond* s.n. (R). Caldas, *Mosén* ?4023 (S), 4024 (S). ITUIUTABA: S. Terezinha, *Macedo* 1643 (RB), 3177 (US). Certaó, Caeduis, Tapeira, near S. Francisco River, *St.-Hilaire* ?1823 (P, isotype of *Melochia lilacina* St.-Hil., also US neg. 5672). Goiás: *Gardner* 3030 (US, W). Planalto, *Glaziou* 20734 (S). Between Conceição and Natividade, *Burchell* 8168 (GH). At Megaponte, Rio Uruhú, *Pohl* 1096 (W). Twenty km. N. of São João da Aliança, region of the Chapada dos Veadeiros, *Dawson* 14247 (US). MATO GROSSO: Cuyabá, *Malme*

2633 (S). Coxipó da Ponte O. (Cuyabá), *Hoehne* 2982 (719) (R). Tapirapoan, *Hoehne* 1280 (R). SÃO PAULO: Near Batataes, *Riedel & Luschath* 2243 (LE). Itú, *Riedel & Luschath* 1992 in part (LE, US neg. 5274, det. as *M. hirsuta* Cav. var. *macrophylla* Schum. by Schumann). Moji-Guaçu, *Eiten & Machado de Campos* 1534 (US).

PARAGUAY: In regione cursas superior fluminis Y-acá, Cordillera Central near Piribebuy, *Hassler* 6748 in part (P, S).

This species is related to *Melochia splendens* St.-Hil. & Naud., but the inflorescence of the latter is primarily axillary rather than primarily terminal. It is also close to *Melochia savannarum* Britt., but the latter generally is a smaller, more prostrate plant with smaller leaves and a shorter terminal inflorescence with fewer flowers at a node.

29b. *Melochia villosa* (Mill.) Fawc. & Rendle var. *regnellii* (Schum.) A. Goldberg, comb. nov.

Melochia hirsuta Cav. var. *Regnellii* Schum. in *Mart. Fl. Bras.* 12(3):46, pl. 10. 1886.

The leaves of this variety have few, scattered, mostly simple hairs; the stipules are broader than those of the other varieties; the stem is pubescent in two longitudinal lines; and the internodes of the terminal inflorescence are long.

TYPE LOCALITY: Caldas, Minas Gerais, Brazil. The lectotype, *Regnell* III 278, is cited below.

DISTRIBUTION: Minas Gerais, Brazil.

BRAZIL: MINAS GERAIS: *Widgren* s.n. (R, S). Caldas, *Regnell* III 278 (S, lectotype of the variety; R, US, isotypes of the variety); *Lindberg* 284 C(S).

29c. *Melochia villosa* (Mill.) Fawc. & Rendle var. *tomentosa* (Schum.) A. Goldberg, comb. nov.

Melochia hirsuta Cav. var. *macrophylla* Schum. in *Mart. Fl. Bras.* 12(3):47. 1886.

Melochia hirsuta Cav. var. *calophylla* Schum. in *Mart. Fl. Bras.* 12(3):47. 1886.

Melochia hirsuta Cav. var. *tomentosa* Schum. in *Mart. Fl. Bras.* 12(3):47. 1886.

Melochia subcordata Morong, *Ann. New York Acad. Sci.* 7:62. 1892.

Melochia hirsuta Cav. var. *tomentosa* Schum. f. *ferruginea*, f. *albiflora*, and f. *minus induta*, all Schum. & Hassl. *Bull. Herb. Boiss.* II, 4:72. 1903.

The leaves and stem of this variety are much hairier than those of the typical variety. They are tomentose or villous-tomentose, and usually tan- or ferruginous-canescenscent. The hairs are predominantly or exclusively stellate, in the other varieties they are predominantly or exclusively simple.

TYPE LOCALITY: Goiás and São Paulo, Brazil. The lectotype, *Riedel* no. 1992 dupl. 16, is cited below.

DISTRIBUTION: Venezuela to northern Argentina.

VENEZUELA: APURE: ALTO-APURE: Hato Matapalo, *Jahn* 212 (US).

BRAZIL: *Riedel* 1992 dupl. 16 (W, lectotype). *Regnell* III 277a (S). Villa

Boa, *Pohl* 1232 (W). Western Brazil, *Tamberlik* s.n. (W). ?RIO BRANCO: *Kuhlmann* 417 (US). MINAS GERAIS: *Claussen* 96 (GH, P, S). *Pires & Black* 3064 in part (US). Uberaba, *Regnell* III 277 in part (S, US). Bello Horizonte, *Barreto* 7858 (R). Bello Horizonte and Bairro do Bomfim, *Magalhães* 78 (R). ?Morro de Caxambú, *Glaziou* ?15849 (K). Lagoa Santa, *Warming* s.n. (S). Porto Alegre, *Regnell* III 277 in part (S). Before Rib. do Frada, *Pohl* 3281 (W). SÊRRO: 3 km. from Sêrro, *L. O. Williams & Assis* 6851 (US). Rio das Pedras ao Vallú, *Glaziou* 18901 (R). Goiás: Mossamedes, *Ule* 487 (R, US). Near city of Goiás, *Burchell* 6641 (GII, syntype of *M. hirsuta* Cav. var. *calophylla* Schum.), 6920 (GH). ?Goiás: F neg. 19636 of Pohl? dupl. 517 (US, syntype of *M. hirsuta* Cav. var. *calophylla* Schum.). MATO GROSSO: Bomfim, *Diogo* 268 (R, US), 241 (R). Triumpho, Rio S. Laurenço, *Hoehne* 4561 (R). Cuiabá, *Hoehne* 4881 (711) (R); *Malme* 1292 (S). SÃO PAULO: Batataes, *Regnell* III 277 in part (S). Itú, *Riedel & Luschnath* 1992 in part (LE, US neg. 5267).

PARAGUAY: Near Bellavista (Apa), *Hassler* 7758 (S, W). Villarrica, *Jorgensen* 3809 (S, US). Cerro Noaga, *Anisits* 2846 (S). Between Rio Apa and Rio Aquidaban, Centurion, *Fiebrig* 4276 (L). In region of River Alto Paraná, *Fiebrig* 6392 (US). Road to "Yerbales" montum "Sierra de Maracayú," *Hassler* 5584 (W). Cordillera de Altos, *Hassler* 3599 (W). Sierra de Amambay, *Rojas* in *Hassler* 10006 (W). Central Paraguay, *Morong* 292 (US, isotype of *Melochia subcordata* Morong). CAAZAPA: Borja, *West* 8544 (UC). In regione cursus superior fluminis Y-Acá, Cordillera Central near Piribebuy, *Hassler* 6748 in part (W).

ARGENTINA: FORMOSA: Colonia Clorinda, *Venturi* 9098 (US). CORRIENTES: MOURUCUYÁ: Est. Santa Teresa, Tacuaral, *Cristóbal et al.* 10 (UC). GENERAL PAZ: Los Cubanos, *Schwarz* 275 (S). PASO DE LOS LIBRES: Pueblo Paso de los Libres, *Ibarrola* 2051 (US). BERÓN DE ASTRADA: ?Chuicho, *Schwarz* 333 (US). MISIONES: Posadas, Loreto, bank of River Alto-Paraná, *Ekman* 187 (S). At River Yabebiry, *Ekman* 1974 (S). CANDELARIA: Loreto-Rinconada de Yabebiry, *Montes* 5?, February 1946 (UC).

30. *Melochia savannarum* Britt. Mem. Torr. Bot. Cl. 16:81. 1920.

A prostrate or erect herb to suffrutex with several branches from the base and sometimes branched above, 0.2–0.6 meter long, the root woody, thickened, 0.9 cm. wide, the young stems tomentulose, hairs stellate, 0.1–0.3 mm. long, usually also forked and simple hairs 0.5–1.7 mm. long, few glandular hairs 0.3–0.6 mm. long, internodes 0.7–2.7 cm. long; stipules 2.2–3.6 mm. long, 0.5–0.7 mm. wide, lanceolate, ciliate, hairs simple, 0.3–0.8 mm. long; petiole 0.07–0.5 (–0.8) cm. long, pubescence similar to that of the stems but with long hairs more abundant.

Lamina 1.0–2.2 cm. long, 0.7–1.8 cm. wide, ovate, rarely also sub-oblong, the base rounded to truncate, rarely subcordate, the apex rounded to subacute, hairs on upper surface simple, appressed, 0.3–1.3 mm. long, sometimes also stellate, forked, sometimes also ciliate, hairs glandular and simple, 0.5 mm. long, sometimes glabrate, the lower surface with few to numerous stellate hairs 0.1–0.3 mm. long, and simple somewhat appressed hairs 0.3–1.0 mm. long, the latter type may be absent or predominant, the margin irregularly dentate, serrate or

crenate-serrate, serrations 0.9–4.0 mm. wide, 0.5–2.1 mm. high, extending to the base of the leaf, 4–6 pairs of primary veins, 1 or 2 are basal.

Inflorescences terminal and in the axils of the upper 1–6 leaves, subcapitate, 2–6 flowers in a cluster, less than 1 cm. to 4 cm. long, with flowers at 1–3 nodes, peduncle none, the pedicels 0.5–2.0 mm. long; bracts 2.5–5.8 long, 0.2–1.0 mm. wide, lanceolate to linear, usually 3 immediately subtending the flower, others sometimes present below, rarely 2 united part way, mostly ciliate, hairs simple, 0.3–1.0 mm. long, sometimes also a few glandular and fewer forked and stellate hairs, 0.3 mm. long.

Calyx 3.0–4.8 mm. long, 3.0–4.7 mm. wide, hirsute-tomentose, hairs simple, forked, and stellate, 0.1–1.0 mm. long, the teeth 1.0–1.8 mm. long, 0.8–1.8 mm. wide, deltoid-acute, the sinus rounded to acute; petals blue, pinkish blue, pink and pale toward the base, nearly white with a faint tinge of violet, 5.2–9.0 mm. long, 2.1–4.5 mm. wide, obovate, obovate-oblong, or obovate-cuneate, the claw 0.5–1.0 mm. long, the base free of staminal tube or attached to it for 0.5–1.5 mm.

Longistylous form. Stamens 3.5–4.4 mm. long, the filaments united up to the anthers, occasionally a staminode 0.4 mm. long present, a few simple hairs 0.1–0.2 mm. long on the filament tube, the anther 1.2–1.5 mm. long, 0.6–0.7 mm. wide, oblong, rather deeply emarginate at both ends, nearly to the middle from the apex; pistil 5.2–6.2 mm. long, the styles free for 2.0–4.0 mm., united for 0.5 mm., papillose at the apex for 1.5–2.0 mm., the ovary ellipsoid to ovoid, tomentulose, hairs 1.0 mm. long, stipe none.

Brevistylous form. Stamens 4.7–6.8 mm. long, the filaments free for 2.5–2.7 mm., very few simple hairs 0.1 mm. long on the filaments and filament tube, the anther 1.1–1.4 mm. long, 0.6–0.8 mm. wide, shape similar to that above; pistil 2.3–4.0 mm. long, the styles filiform, recurved, free for 1.0–1.5 mm., united for 0.6 mm., the ovary ovoid, tomentulose, hairs 0.2–1.0 mm. long.

Fruit 3.0–3.2 mm. long, 3.4–3.9 mm. wide, globular, pentagonal, the sulci between the carpels very shallow, extending about one-fifth of way to the center of the fruit, hirsute-tomentulose, hairs simple and forked, 0.1–1.0 mm. long, stipe none; dehiscence loculicidal along the dorsal suture, eventually also septicial; seeds 1.8 mm. long, 1.2 mm. wide (unripe 2.0–2.5 by 1.1–1.9 mm.), trigonal, dark brown, 1 per cell.

Flowering specimens collected from December to April, and in June and August; fruiting ones, from December to February and in June.

TYPE LOCALITY: Herradura, Pinar del Río, Cuba, in savannas and along streams; type collected by Earle, no. 639, cited below.

DISTRIBUTION: Isle of Pines and Pinar del Río, Cuba, in white sand,

tall-grass savanna, in sandy pinelands, in wet or dry habitats, near sea level and on uplands.

CUBA: ISLE OF PINES: Near Playa Nueva Gerona, *Killip* 44515 (US). Cerro de Cunagua, *Killip* 43669 (US). San Francisco de las Piedras, *Killip* 43549 (US). Along the road to Playa, *Killip* 42996 (US). San Pedro region, *Killip* 43697 (US). Columbia, *Killip* 43575 (US). Río Júcaro region, *Killip* 42941 (US). Playa Roja, *Killip* 43185 (US). PINAR DEL RÍO: Herradura, *Earle* 639 (NY, type); *Britton et al.* 6518 (US); *Ekman* 10730 (S). El Sábalo, Finca Sabanalamar, *Killip* 32253 (US). Sábalo, *Ekman* 16753 (S). Near Pinar del Río, *W. Palmer & Riley* 448 (US). Laguna Santa Maria, S. of Rio Feo, *Ekman* 17267 (S).

This species is close to *M. villosa* (Mill.) Fawc. & Rendle, but it is generally a smaller, more prostrate plant with fewer flowers at a node, a shorter terminal inflorescence, and smaller leaves. Usually the apex of the lamina is rounded, but usually acute in *M. villosa*.

31. *Melochia splendens* St.-Hil. & Naud. Ann. Sci. Nat. II, 18:36. 1842.

An erect subsimple suffrutex at least 0.45 meter high, the young stems and petioles densely tomentose, tan-canescant, hairs 0.3–2.3 mm. long, internodes 1–3.1 cm. long; stipules 5.2–10 mm. long, 1–3.2 mm. wide, oblique-ovate or lanceolate, sericeous-tomentose, hairs simple, 1 mm. long, and stellate, 0.1 mm. long; petiole short, 0.1–0.4 cm. long.

Lamina 2.3–5.7 cm. long, 1.1–2.6 cm. wide, lanceolate to ovate, the base cuneate to rounded, the apex acute to somewhat rounded, silky and woolly to the touch, both surfaces tan-canescant, densely tomentose, and sericeous, hairs 0.2–1.5 mm. long, short ones stellate, long ones simple, the margin irregularly crenate-serrate, serrations 0.6–2.8 mm. wide, 0.2–0.8 mm. high, 8 or 9 pairs of primary veins, 2 are basal.

Inflorescences mostly axillary in the axils of 4–15 leaves, sometimes a few of the middle ones not subtended by a leaf, sometimes apparently also terminal, 1–1.4 cm. long, subcapitate, in clusters of 2–5 flowers, peduncle none, the pedicels 0–1 mm. long; bracts 10.8–12.0 mm. long, 1.0–1.3 mm. wide, 4 immediately subtending a flower, 2 united at the very base, lanceolate-acuminate, densely tomentose and sericeous, hairs 0.1–2.0 mm. long.

Calyx 5.0–5.2 mm. long, 2.9–3.2 mm. wide, densely sericeous, hairs 1–2.3 mm. long, some stellate, 0.1 mm. long, the teeth 1.5–2.3 mm. long, 1–1.5 mm. wide, deltoid-acuminate with rounded sides, the sinus acute to somewhat rounded; petals 9.6–10.0 mm. long, 1.7–2.0 mm. wide, oblanceolate, attached to the staminal tube for 2 mm., the claw 2–4 mm. long.

Longistylous form not seen.

Brevistylous form. Stamens 7–8 mm. long, the filaments free for

2 mm., a few hairs 0.1–0.2 mm. long on the filament tube, the anther 1.2–1.4 mm. long, 0.6 mm. wide, oblong, emarginate at both ends; pistil 6–6.2 mm. long, the styles filiform, papillose for 0.7 mm. at the apex, free for 2.7–3.0 mm., united for 1.7–1.8 mm., the ovary ovoid, sericeous, hairs 1–2 mm. long.

Fruit (one present) with 4 carpels aborted, 2.5 mm. long, 2.1 mm. wide, sericeous, hairs 1–1.5 mm. long, stipe none; dehiscence loculicidal all along the dorsal suture; seeds 2 mm. long, 1.1 mm. wide, brown, 1 per cell.

TYPE LOCALITY: Goiás, Brazil. The type was collected by Gardner, no. 3601, and is in Herbar Delessert.

DISTRIBUTION: Goiás, Brazil, also Piauí, Brazil, according to Schumann (47), and Arauca, Colombia.

COLOMBIA: ARAUCA: RÍO CASANARE: Esmeralda, *Cuatrecasas* 3855 (US).

BRAZIL: Goiás: F neg. 9607 ex B of Gardner 3601, isotype (US); *Burchell* 8587 (GH).

This species is close to *Melochia villosa* (Mill.) Fawc. & Rendle, but differs by having axillary rather than terminal inflorescences and generally narrower leaves, often lanceolate, and cuneate at the base, rather than ovate leaves rounded or cordate at the base.

32. *Melochia bracteosa* F. Hoffm. Beitr. Fl. Centr.-Ost-Afr. 13. 1889.

Melochia crinita R. Br. ms. in Hiern Welw. pl. 1:90. 1896.

Melochia Welwitschii Hiern, Welw. pl. 1:90. 1896.

Melochia melissifolia Benth. var. *microphylla*, var. *brachyphylla*, var. *bracteosa* (F. Hoffm.), var. *Welwitschii* (Hiern), var. *mollis*, all K. Schum. in Engl. Mon. Afr. Pfl. 5:42. 1900.

Melochia mollis Hutch. & J. M. Dalz. Kew Bull. 297. 1928.

An herb or undershrub about 1 meter high, the young stems and petioles densely covered with simple hairs, sometimes also stellate, forked, and glandular, 0.2–3.2 mm. long, the internodes 2–6.5 cm. long; stipules 8–10 mm. long, 1–2.8 mm. wide, lanceolate, ciliate and hirsute, hairs simple, sometimes also forked, 0.2–2.7 mm. long; petiole 0.3–2.3 cm. long.

Lamina 3.5–8.5 cm. long, 1.2–4.3 cm. wide, lanceolate to ovate, the base rounded to subcordate, the apex acute, both surfaces sericeous, woolly or velvety to the touch, hairs simple, sometimes also forked stellate, and glandular, 0.2–2.2 mm. long, the margin irregularly crenate-serrate, serrations 0.5–3.6 mm. wide, 0.4–2.0 mm. high, 7–11 pairs of primary veins, 2 or 3 are basal.

Inflorescences 1–4.8 cm. long, in the axils of 10–14 or more leaves, sometimes 2 clusters per axil, 2–10 flowers per cluster, the peduncle 0–3.0 cm. long, the pedicels 0.5–3.5 cm. long; bracts sometimes 2 united at the very base, (3.5–) 5.2–12.2 mm. long, 0.3–1.5 mm. wide,

lanceolate to sublinear, sometimes falcate, ciliate and hirsute, hairs simple, sometimes also glandular, 0.2–3.2 mm. long.

Calyx membranous, 3.0–4.5 mm. long, 2.6–4.3 mm. wide, hirsute-sericeous, hairs simple, 0.2–2.0 mm. long, mostly near the apex, the teeth 1–2 mm. long, 0.8–1.7 mm. wide, deltoid, acute to acuminate, the sinus broadly rounded, teeth distant; petals white, 7.5–10 mm. long, 2–3.5 mm. wide, obovate to oblanceolate, cuneate, attached to the stamens for 1–2 mm., the claw 1.5–2.0 mm. long.

Longistylous form. Stamens 5.9–6.8 mm. long, the filaments united up to the anthers, sometimes very few scattered, simple hairs on the staminal tube, the anthers 1.1–1.4 mm. long, 0.5–0.9 mm. wide, oblong, emarginate at both ends, nearly to the middle from the apex; pistil 6.4–8.1 mm. long, the styles filiform, free for 2–6 mm., to the ovary, or united for 1–3 mm., papillose for 0.7 mm., the ovary globular-ovoid, sericeous, hairs mostly at the apex, sericeous, simple, 0.5–1.7 mm. long, stipe none.

Brevistylous form not seen.

Fruit 3.0–3.5 mm. long, 3.3–4.0 mm. wide, globular, obtusely pentagonal, the sulci between the carpels shallow, extending a fifth to a fourth of way to the center of the fruit, hirsute-tomentose, hairs simple, 0.2–1.5 mm. long; dehiscence first loculicidal all along the dorsal sutures and then along the ventral sutures, finally septicidal, the fruit falling apart; seeds brown, 1.7–2.3 mm. long, 1.0–1.5 mm. wide, 1 per cell.

Flowering specimens collected in January, May to July, October and November; fruiting ones in January, May to July, and November.

TYPE LOCALITY: Ugalla River, W. Tanganyika, type F. Hoffman 275.

DISTRIBUTION: Sierra Leone, Cameroon, Central African Republic, Angola, The Congo, Uganda and Tanganyika, in forest, low grassland swamp, and dry clay soil, at 30–1,216 meters elevation.

SIERRA LEONE: *Thomas* 8101 (US). Yonibana, *Thomas* 4191 (S).

CAMEROON: Bipinde, *Zenker* 1318 (L, S), 4740 (L). SOUTH CAMEROON: Bite near R. Ja., *Bates* 604 (US).

CENTRAL AFRICAN REPUBLIC: Haut-Oubangui, between the Yambéré and Krébedje, *Chevalier* 6044 (L).

ANGOLA: PORTUGUESE CONGO: Sumba, Peco, near Zaire River, *Gossweiler* 8714 (US).

THE CONGO: Kwango, *Vanderyst* 1413 (US). Bangala, *Fr. Hens* C 388 (L).

COQUILHATVILLE: Tkenga, *Vebrun* 717 (S). Yangambi, *Louis* 16145 (US).

UGANDA: Kivuru, *Dümmer* 881 (US).

TANGANYIKA: Stromgebiet des Ruhudje, Landschaft Massagati, nördlich des Flusses, ca 35°30' E., *Schlieben* 1092 (S, US, US neg. 5611).

This species is close to *M. villosa*, *M. mellissifolia*, and *M. splendens*. It differs from the first by having axillary inflorescences rather than predominantly terminal ones. Its flowers are twice as large as the

second and its leaves are larger, often hairier and usually have relatively shorter petioles. It differs from the third by having longer petioles, usually broader leaves, rounded to subcordate at the base rather than cuneate to rounded, higher serrations, longer pedicels, a shorter calyx, and broader petals.

33. *Melochia melissifolia* Benth. *in* Hook. Journ. Bot. 4:129. 1841.

Melochia concinna Miq. *Linnaea* 22:467. 1849.

Riedleia concinna (Miq.) Walp. *Ann.* 2:166. 1852.

Riedleia sparsiflora Klotzsch ex Walp. *Ann.* 2:166. 1852.

An erect or spreading herb to suffrutex, blooming the first year, sometimes with several slender stems from near the base, 0.08–1.0 meter high, the taproot as thick as the base of the stem, the young stems pilose, hairs stellate and simple, occasionally a few glandular and forked, 0.2–1.0 mm. long, internodes (0.8–) 1.3–3.7 cm. long; stipules 2.6–5.3 mm. long, 0.6–1.0 mm. wide, lanceolate, mostly ciliate, hairs simple, 0.3–1.3 mm. long; petiole 0.2–1.5 cm. long, hirsute-pilose, hairs simple and stellate, 0.2–1.5 mm. long.

Lamina 0.5–3.5 cm. long, 0.5–1.6 cm. wide, ovate to lanceolate, the base rounded, the apex usually acute, sometimes rounded, a few scattered, simple, generally appressed hairs, sometimes a few glandular, 0.3–1.1 mm. long on both surfaces, especially on the veins of the lower surface, the upper surface sometimes glabrate and sometimes reddish, the margin irregularly crenate-serrate, serrations (0.5–) 0.9–2.3 mm. wide, 0.3–1.0 mm. high, 5–8 pairs of primary veins, 2 are basal.

Inflorescences axillary, consisting of 1–5 flowers in the axils of each of the upper 6–19 leaves, 0.5 cm. long, sometimes also terminal at 4 nodes, 4 cm. to first leaf, peduncle none, the pedicel 0–2 mm. long; bracts sometimes united at the base, 3 immediately subtending the flower, longer than the petals, (2–) 3–6.7 (–8.5) mm. long, 0.3–1.1 mm. wide, lanceolate to linear, mostly ciliate, hairs simple, 0.5–1.5 mm. long.

Calyx membranous, 1.4–2.4 mm. long, 1.7–2.8 mm. wide, with a few scattered simple hairs 0.3–1.0 mm. long, the teeth 0.4–1.0 mm. long, 0.4–0.8 mm. wide, deltoid, the sinus obtuse; petals white, pink, or rose lilac, (1.7–) 2.7–4.0 mm. long, 0.5–1.4 mm. wide, obovate-ob lanceolate, the claw 0.3–0.5 mm. long, almost entirely free from the staminal tube.

Androecium and gynoecium about equal in length. Stamens (1.2–) 1.7–2.4 mm. long, the filaments free for 0.3–1.2 mm., the anther relatively small, oblong, 0.3–0.4 mm. long, 0.2–0.3 mm. wide, emarginate at both ends, nearly to the middle from the apex; pistil 1.3–2.3 mm. long, the styles free to the ovary, 0.6–1.1 mm. long, the ovary ovoid, densely hirsute-sericeous, hairs 0.3–1.0 mm. long.

Fruit 2.4–2.7 mm. long, 3.2–3.3 mm. wide, subglobose, pentagonal, the sulci between the carpels very shallow, extending a fifth to a fourth of way to the center of the fruit, hirsute, hairs simple, 0.1–1.0 mm. long, stipe none; dehiscence loculicidal along the dorsal suture and then along the ventral, eventually also septicidal, the fruit falling apart; seeds 1.4–1.8 mm. long, 1–1.3 mm. wide, trigonal, dark brown, 1 per cell.

Flowering specimens collected from March to May, and July to January; fruiting ones, from March to July, and September to January.

TYPE LOCALITY: British Guiana, syntypes collected by Schomburgk, no. 366, and French Guiana, syntypes collected by Leprieur, no. 122, one cited below.

DISTRIBUTION: Central America, the Guianas, Brazil, Guinea, Sierra Leone, and the Congo, usually in wet or moist thicket, roadside, weedy fields, savanna, sometimes in dry forest, at 0–850 meters elevation.

BRITISH HONDURAS: *Schipp* 1060 (MICH, S).

COSTA RICA: Boca Culebra, shore of the Pacific, *Pittier* 12056 (US). Boruca, *Pittier* 4573 (US). Mano de Tigre, between Boruca and Térraba, *Tonduz* 4592 (US). SAN JOSÉ: El General, *Skutch* 2881 (S, US).

PANAMA: Paitilla, *Bro. Heriberto* 235 (US). COCLÉ: Aguadulce, *Pittier* 4833 (US). CANAL ZONE: Gamboa, *Standley* 28364 (US). Corozal, *Standley* 27351 (S, US). Summit, *Standley* 26925 (US). Las Cascadas Plantation, near Summit, *Standley* 29629 (US), 30131 (US). Balboa, *Standley* 25520 (US). Hills west of the Canal, near Gatún, *Standley* 27271 (US). Cerro Gordo, near Culebra, *Standley* 26028 (US). COLÓN: Between France Field, Canal Zone, and Catival, *Standley* 30384 (US). PANAMÁ: Vicinity of Juan Franco Race Track, near Panamá, *Standley* 27756 (US). Corozal Road, near Panamá, *Standley* 26863 (US). North of Panamá, *Bro. Paul* 586 (US). Río Tecumen, *Standley* 29435 (S, US). Near the big swamp east of the Río Tecumen, *Standley* 26496 (US). Near Matías Hernández, *Standley* 28992 (US). Nuevo San Francisco, *Standley* 30756 (US). Laguna de Portala, near Chepo, *Pittier* 4619 (US).

FRENCH GUIANA: *Leprieur* 122 (US, syntype). Îles du Salut, Mana, *Sagot* 53 (P, S, W), 54 (W). Cayenne, *Aublet* s.n. (W).

SURINAM: *Focke* 31 (L). *Hostmann* 1575 (W). *Tulleken* 242 (L). Near Paramaribo, *Kappler* 1575 (W). Fluv. Cappenname Sup., *Boon* 1115 (US). Para, *Splitgerber* 1158 (L).

BRITISH GUIANA: Roraima, *Schomburgk* 265 (W). Mazaruni Station, *Sandwith* 1084 (S).

BRAZIL: *Burchell* 9027 (K). AMAZONAS: Manaus, *Schwacke* 366 Coll. III (R, US). PARÁ: *da Costa* 67A (R, US). Near Pará, *Burchell* 9566 (GH, K, L). Between S. João de Araguaya and S. Anna, *Burchell* 9234 (K). Vicinity of Santarem, *Spruce* May 1850 (RB, W). MATO GROSSO: Cuiabá, *Malme* s.n. (S).

GUINEA: Near Mamou, *Sweeney* 4 (US).

SIERRA LEONE: *Thomas* 6117 (US). Freetown, *W. H. & A. H. Brown* 59 (US).

THE CONGO: WOMBALI: Casier St. Jean Mission, *Vanderyst* 1269 (S).

This species is close to *Melochia manducata* Wright, but the inflorescences are not pedunculate, the fruit and leaves are smaller, and the fruit is not covered with glandular hairs. It is also related to *M. villosa* (Mill.) Fawc. & Rendle but differs in the position of the inflorescences and size of the fruit, and its flowers are not dimorphic.

It is apparently indigenous to America and Africa.

It is illustrated by Schumann (47).

34. *Melochia arenosa* Benth. *in* Hook. Journ. Bot. 4:127. 1841.

Melochia cinerea St.-Hil. & Naud. Ann. Sci. Nat. II, 18:35. 1842.

Riedleia littoralis Poepp. & Endl. Nov. Gen. & Sp. Pl. 3:73. 1845.

Melochia littoralis (Poepp. & Endl.) Schum. *in* Mart. Fl. Bras. 12(3):44. 1886.

Melochia corumbensis S. Moore, Trans. Linn. Soc. II, Bot. 4:317. 1895.

?*Melochia cinerea* St.-Hil. & Naud. var. *discolor* Hassl. Addenda Pl. Hassl. 12. 1917 (without description).

Melochia llanorum Cuatr. Rev. Acad. Colomb. 8:487. 1952.

A low shrub, sometimes herb, 0.3–2 meters high, the young stems and petioles densely cineraceous-tomentulose, hairs stellate, 0.1 mm. long, also a very few glandular hairs, 0.1–0.2 mm. long, internodes 1–4.3 cm. long; stipules deciduous, 2.6–9.5 mm. long, 0.3–1.0 mm. wide, usually linear-acute, densely tomentulose, hairs stellate, 0.1 mm. long, a few simple hairs, 0.2–1.0 mm. long; petiole 0.2–2.9 cm. long.

Lamina 0.9–7.5 cm. long, 0.6–5.5 cm. wide, ovate, oval, oblong or lanceolate, the base rounded to subcordate, the apex rounded to acute, the upper surface green to canescent, the lower cinereous, both densely tomentulose, velvety to the touch, hairs stellate, with 8–12 rays, 0.1 mm. long, sometimes a few simple hairs 0.2–0.8 mm. long, the margin irregularly crenate-serrate, serrations 0.7–3.8 mm. wide, 0.2–2.5 mm. high, 5–10 pairs of primary veins, 2 are basal.

Inflorescences in axils of upper 3–9 (–25) leaves, 1.3–2.5 cm. long, the ultimate divisions umbellate, 3–6 flowers per umbel, the peduncle 0.3–1.5 cm. long, 1–3 per axil, the pedicel 2–5 mm. long, to 8 mm. long in the fruiting stage; bracts at the base of the pedicels, 1.8–4.3 (–8.0) mm. long, 0.2–1.1 mm. wide, usually linear, densely tomentulose, hairs stellate, occasionally glandular, 0.1 mm. long.

Calyx 3.1–5.5 mm. long, 3.2–5.4 mm. wide, not accrescent, densely tomentulose, hairs stellate, a few glandular, 0.1–0.2 mm. long, the teeth 1.0–2.7 mm. long, 0.5–1.7 mm. wide at the base, nearly linear distally, broadening at the base, the sinus rounded, the teeth distant; petals rich pink, red, rose violet, lilac, lilac or violet with yellow proximally, 6–10 mm. long, 1.8–4.0 mm. wide, obovate, oblanceolate, or oblong, the claw 0.8–1.5 mm. long, the base free from the staminal tube or attached to it for 0.5–1.5 mm.

Longistylous form. Stamens 3.4–4.7 mm. long, the filaments united up to the anthers, sometimes a few stellate hairs 0.1 mm. long near the base of the staminal tube, the anther 1.0–1.3 mm. long, 0.5–0.7 mm. wide, oblong, emarginate at both ends, nearly to the middle from the apex; pistil 4.8–7.0 mm. long, the styles filiform, free for 2.7–4.0 mm., to the ovary or united for 0.6–1.0 mm., papillose at the apex for about 1.2–2.0 mm., the ovary ellipsoid to globular-ovoid, the ovary and base of styles tomentulose-hirsute, hairs 0.1–1.0 mm. long, stipe none.

Brevistylous form. Stamens 5.6–7.7 mm. long, the filaments free for 2.6–4.3 mm., sometimes a few hairs at the base of the tube, sometimes staminodes present, 0.2–0.3 mm. long, the anther 1.1–1.7 mm. long, 0.5–0.8 mm. wide, oblong, slightly emarginate at both ends; pistil 4.8–6.2 mm. long, the styles filiform, free for 1.7–3.8 mm., united for 0.6–0.7 mm., the ovary ovoid, the ovary and base of styles tomentulose, hairs 0.1–1.7 mm. long.

Fruit 3.2–3.5 mm. long, 3.5–4.5 mm. wide, obtusely pentagonal, globose, the sulci between the carpels shallow, extending a fourth to a fifth of way to the center of the fruit, hirsute-tomentulose, hairs simple, forked, and stellate, a very few glandular, 0.1–1.0 mm. long, stipe none; dehiscence loculicidal along entire dorsal and ventral sutures, later septicidal, the fruit falling apart; seeds 2.0–2.3 mm. long, 1.2–1.5 mm. wide, trigonal, dark brown to black, 1 per cell.

Flowering specimens collected from April to July and September to January; fruiting ones, from October to December, April, and June.

TYPE LOCALITY: Syntypes collected by Schomburgk, nos. 31 and 519, the latter cited below, on sandy banks of the Essequibo and Rupununi Rivers, and by Gardner, no. 2489, in Piauí, Brazil, also cited below.

DISTRIBUTION: Cuba and Venezuela to Paraguay, often in places that are sometimes inundated and moist savanna and woods at 130–?1,300 meters elevation.

CUBA: MATANZAS: N. of Matanzas, Hoyo Colorado, *Bro. Alain* 3951 (US).

BRITISH GUIANA: Essequibo and Rupununi Rivers, *Schomburgk* 519 (L, syntype). RUPUNUNI: Lethem, *Irwin* 567 (US). Rupununi Savanna, *Vesey-Fitzgerald* 745 in part (US). BASIN OF THE RUPUNUNI RIVER: Karenambo, lat. 3°45' N., *A. C. Smith* 2246 (A, K, P, S, US).

VENEZUELA: GUÁRICO: Palo Seco, between La Enrucijada and the Mision de Arriba, Calabozo, *Pittier* 14960 (US).

COLOMBIA: Castañal, *Sonntag* 18 (GH, also US neg. 5612). ARAUCA: Llanos de Casanare, Esmeralda, *Cuatrecasas* 3934 (US, isotype of *Melochia llanorum*, Cuatr.).

BRAZIL: *Regnell* III 631 (P). Western part, *Tamberlik* s.n. (W). AMAZONAS: Amazon Rio, F neg. 9605 ex B, probably an isotype of *Melochia littoralis* (Poepp. & Endl.) Schum. RIO BRANCO: São Marcos, *Ule* 7869 (L). PARÁ: Boa Vista on

the Tapajós River, *Dahlgren & Sella* 65 (US). Jutahy de Almeirim, *Ducke* 18959 (RB). Medio Cuminá, *de Sampaio* 5921 (R, US). Alto Cuminá, *de Sampaio* 5696 (R, US). Rio Erepecurú, *de Sampaio* 5372 (R, US). PIAUÍ: *Gardner* 2489 (US, syntype, also F neg. 9597 ex B in US). MINAS GERAIS: *Claussen* 95 (P, isotype of *Melochia cinerea* St.-Hil. & Naud., also US neg. 5667). MATO GROSSO: Corumbá, F neg. 9601 ex B of *Moore* 905, isotype of *Melochia corumbensis* Moore (US); *Malme* s.n. (S).

PARAGUAY: Alto-Paraguay, Chaco, 21° S. lat., *Fiebrig* 1336 (K, S).

This species can be distinguished from other members of the section by the abundant, very short, stellate hairs with numerous rays (8–12), 0.1 mm. long, on the leaves and by its axillary pedunculate inflorescences.

In addition to the localities cited above, *Schumann* (47) reported *M. arenosa* Benth. from Goiás, *M. littoralis* (Poepp. & Endl.) Schum. from the shores of Lake Ega, Amazonas, Brazil, and *M. cinerea* St.-Hil. & Naud. from Bahia, between Victoria and Bahia, and from upper Surinam. I consider the last two species to be synonyms of *M. arenosa* Benth.

I have not selected a lectotype because I have not seen the syntypes located at Kew.

35. *Melochia simplex* St.-Hil. Fl. Bras. Mer. 1:164. 1825.

Melochia oblonga Benth. in Hook. Journ. Bot. 4:128. 1841.

Melochia sorocabensis Schum. in Mart. Fl. Bras. 12(3):42, pl. 8. 1886.

Melochia stricta Schum. in Mart. Fl. Bras. 12(3):42. 1886.

Melochia Missionum Ekman, Arkiv. Bot. Stockh. 9(4):47, fig. 10. 1910.

Melochia stricta Schum. f. *Missionum* (Ekman) Hassl. Repert. Sp. Nov. Fedde 8:123. 1910.

An erect or subdecumbent-ascending herb to suffrutex 0.4–1.5 meters high, simple or 2- to 3-branched from near the base, blooming during the first year, the young stems and petioles tomentulose, hirsute or subglabrous, hairs stellate, sometimes also forked, simple, and glandular, 0.1–0.2 (–0.5) mm. long, internodes 0.8–6.9 cm. long; stipules caducous, 2.1–8.0 mm. long, 0.3–1.7 mm. wide, lanceolate to nearly linear, ciliate and sometimes tomentulose, hairs simple, stellate, or forked, 0.1–0.5 mm. long; petiole short, 0.2–1.0 cm. long.

Lamina 1.5–9.5 cm. long, 0.5–3.0 cm. wide, lanceolate to suboblong, nearly linear near the apex of the stem, the base narrowly rounded to slightly cuneate, the apex acute, acuminate, or slightly rounded, the upper surface with few scattered stellate, forked, simple, and rarely glandular hairs, 0.1–0.7 mm. long, the lower surface with scattered hairs or slightly tomentulose, especially on the veins, hairs stellate, a few forked and simple, most 0.1 mm., a few to 1 mm. long, the margin irregularly crenate-serrate, serrations 0.3–6.0 mm. wide, 0.2–1.5 mm. high, 5–12 pairs of primary veins, 1 or 2 are basal.

Inflorescences terminal, extending 1–18 cm. beyond the first leaf, spicate- to paniculate-cymose, the ultimate divisions subcapitate um-

bels of 2–5 flowers, sometimes also or only axillary, 0.8–7.5 cm. long, in the axils of 1–9 leaves, the peduncle 0.2–4.1 cm. long, the pedicel 0.3–3.6 mm. long; bracts 1–5.5 mm. long, 0.1–1.5 mm. wide, deltoid-acuminate, lanceolate, or linear, 2 or 3 immediately subtending the flower or on the pedicel, sometimes in pairs at the base of the pedicel or peduncle, ciliate, a few forked and stellate hairs 0.1–0.5 mm. long on the abaxial surface.

Calyx pale yellowish green, sometimes reddish purple, 2.4–4.5 mm. long, 2.5–5.0 mm. wide, tomentulose or with scattered stellate and sometimes also forked, simple, and glandular hairs 0.1–0.2 (–0.5) mm. long, the teeth 0.7–1.9 mm. long, 0.6–2.2 mm. wide, deltoid at the base to linear at the apex, distant, the sinus rounded to truncate; petals violet, purple, rose, blue, purple distally and yellow proximally, or orange, 5.6–10.2 mm. long, 1.3–4.7 mm. wide, oblanceolate- to obovate-cuneate, free from the staminal tube or attached to it for 0.3–2.0 mm., the claw 0.5–1.5 mm. long.

Longistylous form. Stamens 3.4–4.6 mm. long, the filaments united up to the anthers, the anther 0.9–1.6 mm. long, 0.4–0.7 mm. wide, oblong, emarginate at both ends, nearly to the middle from the apex; pistil 4–5.8 mm. long, the styles filiform, free for 1.6–4.3 mm., united for 0.5–2.8 mm., papillose and subclavate for 0.7–2.0 mm. at the apex, the ovary globular to ovoid, sericeous or hirsute, especially at the apex, hairs simple, 0.2–0.8 mm. long, the stipe 0–0.5 mm. long.

Brevistylous form. Stamens 4.5–6.6 mm. long, the filaments free for 1.7–3.4 mm., the anther 0.9–1.4 mm. long, 0.4–0.7 mm. wide, similar in shape to that above; pistil 3.4–3.6 mm. long, the styles filiform, free for 1.2–1.5 mm., united for 0.3–0.9 mm., the ovary globular to ovoid, sericeous or hirsute, hairs simple, 0.1–1.0 mm. long.

Fruit 3.4–3.7 mm. long, 3.9–4.0 mm. wide, globular, obtusely pentagonal, the sulci between the carpels shallow, extending a fifth to a fourth of way to the center of the fruit, hirsute, hairs simple and sometimes also forked, stellate, and glandular, 0.1–1.1 mm. long, stipe none; dehiscence loculicidal all along the dorsal and ventral sutures, also septicial, the fruit falling apart; seeds 2.2–2.5 mm. long, 1.1–1.8 mm. wide, trigonal, dark brown, 1 per cell.

Flowering specimens collected from December to April, and in June, August, and October; fruiting ones, from December to March, and in August, and October.

TYPE LOCALITY: The type was collected by St.-Hilaire near the city Guaratingueta, in the northern part of the province of São Paulo, Brazil. The isotype is cited below.

DISTRIBUTION: British Guiana to southern Brazil, Bolivia, Paraguay, and northern Argentina in humid campo, marshes that are often

inundated, among bushes at the edge of a swamp and in shrubby fields, at 160–500 meters elevation.

BRITISH GUIANA: Savannas of the upper Rupununi, *Schomburgk* s.n. (K, type of *Melochia oblonga* Benth., also US neg. 5419).

BOLIVIA: SANTA CRUZ: SARA: Buenavista, *Steinbach* 5483 (GH), 14821 (S).

BRAZIL: F neg. 9608 ex B of *Pohl* 421 (US, presumably the type of *Melochia stricta* Schum.). AMAZONAS: Serra Tayana, *Luetzelburg* 20898 (R). GOIÁS: Brejo do Riacho Fundo, *Glaziou* 20735 (P). Goiás beyond Jaragua, Meia Ponte to Cavalcante, *Burchell* 7821 (P). Goiás?: Corgo-Corallinho, *Pohl* 1834 (W). MATO GROSSO: Coxim, *Hoehne* 2990 (R). CORUMBÁ: Fazenda Aguassuzinho, *Pereira et al.* 401 (US). Fazenda Marilândia, *Pereira et al.* 209 (US). RIO DE JANEIRO OR SÃO PAULO: Coralfalza, *Pohl* 314 (W). SÃO PAULO: *Sellow* 5288 in part (R). Near the city Guaratingueta in the northern part of the province, *St.-Hilaire* Cat. No. 756d (P, isotype); F neg. 35385 of the type ex P (US). Mooça, *Brade* 5973 (S). Near Sorocaba, *Riedel & Luschnath* 1994 (LE, isotype of *M. sorocabensis* Schum., also US neg. 5271); *Riedel* 1994 dupl. 19 (P). Atibaia, *George & Liene Eiten* 2404 (US). PARANA: Fóz do Iguaçu, *Hatschbach* 9726 (US). RIO GRANDE DO SUL: S Leopoldo near P. Alegre, *Theissen* (PACA 7554).

PARAGUAY: Border of Rio Tapiracuai at Primavera, *Woolston* 1072 (US). Est. Tagatiya, *Anisits* 2648 (S). Between Rio Apa and Rio Aquidaban, *Fiebrig* 4780=5207 (GH). Road to "Yerbales" montium "Sierra de Maracayu," Jejuigauzu River, *Hassler* 5700 (GH).

ARGENTINA: CORRIENTES: SANTO TOMÉ: Pueblo, *Ibarrola* s.n. (S). MISIONES: Posadas, *Vattuone & Bianchi* 71 (US). Banks of the Alto-Paraná River, *Ekman* 186 (S, type of *Melochia Missionum* Ekman, also US neg. 5614).

This species is related to *Melochia graminifolia* St.-Hil., but the leaves of the latter are linear, rather than lanceolate or oblong, with obscure and considerably fewer serrations.

36. *Melochia graminifolia* St.-Hil. Fl. Bras. Mer. 1:160, pl. 31. 1825. PLATE 6
Visenia graminifolia (St.-Hil.) Spreng. Syst. 4:Cur. Post. 248. 1827.
Riedleia graminifolia (St.-Hil.) Steud. Nom. II, 2:460. 1841.

An erect perennial herb or suffrutex with 1–3 slender, branched shoots from the base, 0.3–1.2 meters high, 2–4 mm. wide, the root woody, thick, up to 2 cm. wide, the young stems and petioles with scattered stellate hairs about 0.1 mm. long, internodes 0.5–4.7 cm. long; stipules caducous, 2–4.5 mm. long, 0.2–0.4 mm. wide, deltoid-acuminate to acicular, with few hairs about 0.1 mm. long; petiole very short, 0.1–0.3 cm. long.

Lamina 2–9.7 cm. long, 0.2–0.8 cm. wide, nearly linear, the base narrowed, rounded to cuneate, the apex acute, both surfaces green and glabrous, rarely a few hairs on the veins beneath, the margin entire at the base, irregularly and obscurely serrate at the apex, serrations 2–12 mm. wide, 0.2–0.3 mm. high, 4–8 pairs of primary veins, 1 is basal.

Inflorescence terminal, long, slender, branched, racemiform or paniculate, extending 6–31 cm. beyond the first leaf, the flowers soli-

tary or in umbels of 2 or 3, sometimes also in the axils of the upper 1-3 leaves, 2.5-19 cm. long, the pedicels 2-9 mm. long; bracts 0.5-1.5 mm. long, 0.2-0.4 mm. wide, deltoid-acuminate to nearly linear, with few hairs about 0.1 mm. long.

Calyx 1.8-3.0 mm. long, 2.7-4.1 mm. wide, stellate and glandular puberulous, hairs 0.1-0.3 mm. long, the teeth 0.6-1.1 mm. long, 0.4-0.5 mm. wide, deltoid-acute or deltoid-acuminate to nearly linear, the sinus very obtuse, the teeth distant; petals pale lilac, blue, bluish pink, rose, yellowish and red striped at the base, purple distally and yellow with purple veins proximally, violet, yellow, or white, 6.5-10.5 mm. long, 3.0-5.2 mm. wide, obovate-cuneate, the claw 0-0.5 mm. long, the base of petals attached to the staminal tube.

Longistylous form. Stamens 2.6-4.0 mm. long, the filaments united up to the anthers, the anther 1.1-1.2 mm. long, 0.5-0.7 mm. wide, oblong, emarginate at both ends, almost to the middle from the apex, sacs somewhat divergent at the apex; pistil 3.6-4.7 mm. long, the styles free for 1.5-3.1 mm., papillate at the apex for 1.5-2.3 mm., the ovary ellipsoid to ovoid, glabrous or with few hairs 0.1 mm. long, the stipe 0.3-0.8 mm. long.

Brevistylous form. Stamens 5.8 mm. long, the filaments free for 3.0 mm., the anther 1.3-1.4 mm. long, 0.6 mm. wide; pistil 3 mm. long, the styles free for 1.2 mm., the stipe 1 mm. long.

Fruit obtusely pentagonal, depressed-globose, very shallowly sulcate between the carpels, 3.3-4.0 mm. long, 4.2-4.8 mm. wide, tomentulose, hairs simple and forked, 0.1-0.2 mm. long, the stipe 0.4-0.8 mm. long; dehiscence loculicidal along the dorsal suture and later septicidal; seeds 2.2-2.5 mm. long, 1.4-1.6 mm. wide, trigonal, black.

Flowering specimens collected from September to July; fruiting ones, from October to January, and March to May.

TYPE LOCALITY: Marshes near the village of S. Domingos, Minas Gerais, Brazil. Type collected by St.-Hilaire, isotype cited below.

DISTRIBUTION: Eastern Colombia to Paraguay, and southern Venezuela and British Guiana to São Paulo, Brazil, usually in wet argillaceous savannas, sometimes dry grassy llanos, and campo, at 70-500 meters elevation.

BRITISH GUIANA: On Rio Branco, *R. Schomburgk* 805 (L, US).

VENEZUELA: BOLÍVAR: La Paragua, *L. Williams* 12582 (US). Rio Paragua, Potrerito, *Cardona*, 696 (US). Rio Paragua, near Chorrera de Aguacanta, *Killip* 37552 (US).

COLOMBIA: META: Rio Meta, La Poyata, 65 km. E. of Villavicencio, *Cuatrecasas* 4473 (US); *Haught* 2518 (US). Rio Guaviare, San José del Guaviare, *Cuatrecasas* 7720 (US). San Juan de Arama, *Idrobo & Schultes* 699 (US).

BOLIVIA: Velasco, *Kuntze* (US).

BRAZIL: RIO BRANCO: Estrada Boa Vista-Caracará, *Black* 51-13509 (US). Fazenda Bom Intento, *Black* 51-14047 (US). MINAS GERAIS: S. Domingos,

St.-Hilaire 1589 (P, isotype, also US neg. 5664). GOIÁS: *Gardner* 3604 (US). MATO GROSSO: Cáceres, *Hoehne* 1119 (R), 604 (R). Cuiaba, *Malme* Regnell II 3271 (S). Porto Murтинho, *Malme* s.n. (S). RIO DE JANEIRO: Serra da Estrella, Mandioca, *Glaziou* 12459 a (R). SÃO PAULO: Bank of Rio Grande at Melaniros (?), *Regnell* III 279 (S).

PARAGUAY: Between Rio Apa and Rio Aquidaban, Centurion, *Fiebrig* 4123=4029 (L, US). Rio Apa, *Hassler* 7683 (S). In Quebrachal Beo. Branco, *Anisits* 2257 (S).

This species is distinguished from all other species in the genus by its nearly linear, obscurely serrate leaves. It appears to be most closely related to *Melochia simplex* St.-Hil., which has broader leaves and distinct serrations.

37. *Melochia manducata* Wright in Sauvalle, Anal. Acad. Ci. Habana 5:241. 1868.

Melochia glandulifera Standl. Contr. U.S. Nat. Herb. 23:803. 1923.

An erect, annual, simple or branched herb to suffrutex, the stem hollow, 0.3–0.65 meter high, the primary root not as thick as the base of the stem, secondary roots abundant, the young stems glabrous or with a few glandular, stellate, forked, or simple curved hairs 0.1–0.5 mm. long in a narrow longitudinal line, internodes 1.5–6.2 cm. long; stipules 3–7.4 mm. long, 0.7–1.3 mm. wide, lanceolate, ciliate, hairs simple, 0.1–0.7 mm. long; petiole 0.2–5.0 cm. long, tomentulose in a longitudinal line on the upper surface, hairs stellate, forked, a few glandular, 0.1–0.5 mm. long.

Lamina 3–7.5 cm. long, 0.9–6.2 cm. wide, lanceolate to broadly ovate, the base rounded, truncate or subcordate, the apex acute, subglabrous, both surfaces with a few simple appressed hairs 0.1–0.5 mm. long, mostly on the veins, the margin irregularly crenate-serrate, serrations 0.7–3.1 mm. wide, 0.3–1.6 mm. high, 9–12 pairs of primary veins, 2 are basal.

Inflorescences axillary, 0.7–2.8 cm. long, in the axils of the upper 6–10 leaves and sometimes also terminal, extending 1–1.5 cm. beyond the first leaf, umbellate and capitate as well as pedunculate and non-pedunculate in the same axils, 2 or 3 flowers per peduncle, 5–8 flowers per axil, the peduncle 0–1.6 cm. long, the pedicels 0–14.0 mm. long; bracts 2 or 3 immediately subtending the flower, 1.5–5.0 mm. long, 0.3–0.9 mm. wide, lanceolate, ciliate, hairs simple, 0.1–0.5 mm. long.

Calyx membranous, 1.5–2.4 mm. long, 2.3–3.2 mm. wide, with scattered simple and sometimes also a few glandular hairs 0.1–0.2 mm. long, the teeth distant, 0.5–0.8 mm. long, 0.2–0.6 mm. wide at the base, nearly linear toward the apex, the sinus rounded to truncate; petals rose, reddish lilac, or purple, 3.8–4.7 mm. long, 1.3–1.7 mm. wide, obovate to obovate-oblong, free from the staminal tube or attached to it for 0.5 mm., the claw 0.2–0.4 mm. long.

Androecium and gynoecium nearly equal in length. Stamens 2.1–2.4 mm. long, the filaments united up to the anthers, the anther 0.5–0.8 mm. long, 0.3–0.5 mm. wide, oblong, emarginate at both ends, nearly to the middle from the apex; pistil 2.2–2.5 mm. long, the styles filiform, free for 0.8–1.2 mm., united for 0.3 mm., the ovary globular-ovoid, hirsute-tomentulose, hairs simple, 0.1–1.0 mm. long, stipe none.

Fruit 2.7–4.0 mm. long, 3.8–4.8 mm. wide, globular, pentagonal, the sulci between the carpels very shallow, extending a fourth to a fifth of way to the center of the fruit, covered with glandular and simple hairs 0.1–0.7 mm. long, the stipe 0–0.2 mm. long; dehiscence loculicidal along the dorsal and ventral sutures, later septicidal, the fruit falling apart; seeds 1.7–2.3 mm. long, 1.0–1.4 mm. wide, blackish brown, 1 per cell.

Flowering and fruiting specimens collected from October to March, and in August.

TYPE LOCALITY: In palm forest, llanos, and moist places around Huaiquiba, San Cristóbal, Cuba, probable isotypes cited below. I select *Wright* 3510 (US) as lectotype.

DISTRIBUTION: Mexico, Guatemala, Panama, Cuba, Dominican Republic, Colombia, Ecuador, and northern Brazil, in swamp shrubbery, moist places on the road, marsh, llanos, in sandy soil, at 0–100 meters elevation.

MEXICO: GUERRERO: Acapulco and vicinity, *E. Palmer* 107 in 1984–95 (US). CHIAPAS: Tonalá, *Purpus* 6925 (UC; US, type of *Melochia glandulifera* Standl.).

GUATEMALA: Retalhuleu, *Bernoulli & Cario* 3114 (K).

PANAMA: PANAMA: Near the big swamp E. of Rio Tecumen, *Standley* 26655 (US).

CUBA: *C. Wright* 3510 (GH, S, US, probably isotypes).

DOMINICAN REPUBLIC: PACIFICADOR: Pimentel, *Abbott* 653 (US). Santo Domingo, Duarte, Matanzas at Rio Boba, *Ekman* 15866 (S).

COLOMBIA: MAGDALENA: Santa Marta, *H. H. Smith* 724 (S, US). SANTANDER: Along Rio Magdalena near Barranca Bermeja, *Molina & Barkley* 18S205 (US). Puerto Wilches and vicinity, *Killip & Smith* 14790 (US).

ECUADOR: Los Rios: Hacienda Clementina on Rio Pita, *Asplund* 5573 (R, US).

BRAZIL: AMAZONAS: Manaus, Rio Negro, *Ule* 5393 (K, L). PARÁ: Below Obidos, *Kuhlmann* 83 (RB).

This species is close to *M. corchorifolia* L., but differs in that its inflorescences are principally axillary rather than terminal, and are often evidently pedunculate, those of *M. corchorifolia* L. are usually not pedunculate.

38. *Melochia lanceolata* Benth. in Hook. Journ. Bot. 4:128. 1841.

Melochia betsiliensis Baker, Journ. Linn. Soc. 22:451. 1887.

An erect, simple herb, the stem hollow, or branched shrub, the young stems with a narrow longitudinal line of stellate hairs 0.1–0.4 mm. long, glabrous beyond the third internode, internodes (0.7–) 1.5–6.0 cm. long; stipules 1.5–2.2 (–5.0) mm. long, 0.4–0.5 (–1.5) mm. wide, nearly linear or lanceolate, ciliate and with few scattered, simple hairs 0.1–0.2 mm. long; petiole (0.2–) 0.5–3.2 cm. long, slender, with few simple, forked, and stellate hairs 0.2–0.5 mm. long.

Lamina (1.3–) 4.1–10.0 cm. long, 0.6–3.5 cm. wide, lanceolate, the base rounded, the apex acuminate or acute, sometimes obscurely lobed as in *M. corchorifolia* L., subglabrous with very few scattered simple hairs 0.1–0.3 mm. long on the midrib of the upper surface and veins of the lower surface, the margin irregularly serrate, serrations 1–2.7 (–4) mm. wide, 0.3–0.9 mm. high, 9–13 pairs of primary veins, 1 or 2 are basal.

Inflorescence 1–4 cm. long, up to 11 cm. in the fruiting stage, terminal and in the axil of the first leaf, coarctate, corymbiform, the ultimate divisions umbellate, 2 or 3 flowers per umbel, the peduncle 0.5–1.0 cm. long, 2 cm. according to Schumann (47), the pedicel (0.3–) 1.5–4.7 mm. long, with glandular and simple hairs 0.1–0.3 mm. long; bracts usually at the base of the pedicel, 0.5–3.5 mm. long, 0.1–1.0 mm. wide, lanceolate to linear, ciliate with few simple, forked and sometimes glandular hairs 0.1–0.3 mm. long.

Calyx 1.5–2.0 mm. long, 2.0–3.5 mm. wide, with very few simple hairs 0.1 mm. long and glandular ones 0.3–0.6 mm. long, the teeth 0.4–0.5 mm. long, 0.2 mm. wide, linear, distant, the sinus truncate; petals flavescent or lilac, (3.7–) 5.6–6.5 mm. long, (1–) 3–4 mm. wide, obovate-cuneate, attached to the staminal tube for 0.6 mm., the claw 0.2–0.3 mm. long.

Androecium and gynoecium nearly equal in length. Stamens 2.2–2.6 mm. long, the filaments free for 0.2–0.4 mm., the anther 0.6 mm. long, 0.4 mm. wide, oblong, emarginate at both ends, nearly to the middle from the apex; pistil 2.2–2.7 mm. long, the styles filiform, 0.8–1.3 mm. long and free to the ovary, or united for 0.1–0.2 (–0.7) mm., the ovary globular, with few glandular and simple hairs 0.2–0.4 mm. long, stipe none.

Fruit 3.5–4.0 mm. long, 4.0–4.1 mm. wide, globose, very slightly pentagonal, the sulci between the carpels very shallow, extending one-fifth of way to the center of the fruit, with scattered simple and glandular hairs 0.3–0.5 mm. long, the stipe 0.5 mm. long; dehiscence loculicidal along the dorsal and ventral sutures, the fruit falling apart; seeds not quite ripe, 2 mm. long, 1.1 mm. wide, brown, 1 per cell.

Flowering and fruiting specimens collected in May.

TYPE LOCALITY: The type was collected by Schomburgk, no. 362, in British Guiana; an isotype is cited below.

DISTRIBUTION: British Guiana and Surinam, in shallow water, in shade.

SURINAM: *Hostmann* s.n. (L), 449 (W), 457 a (S). *Hostmann & Kappler* 46 (S), 657 B(S). *Schimper* 657 (W). Para, *Splitgerber* 1001 (L).

BRITISH GUIANA: *Schomburgk* 362 (L, isotype).

MADAGASCAR: *Baron* 4757 (P), 4678 (P), syntypes of *M. betsiliensis* Baker.

This species is close to *M. corchorifolia* L., but its inflorescence is corymbiform rather than subcapitate. The leaves of *M. corchorifolia* are most often ovate, those of *M. lanceolata* are lanceolate. Both species are characterized by the nearly equal length of androecium and gynoecium.

39. *Melochia corchorifolia* L. Sp. Pl. 675. 1753.

Melochia concatenata L. Sp. Pl. 675. 1753; Hook. Fl. Brit. Ind. 1:374. 1874, in synonymy.

Melochia supina L. Sp. Pl. 675. 1753; Hook. Fl. Brit. Ind. 1:374. 1874, in synonymy.

Corchorus javanicus Burm. f. Fl. Ind. 123. 1768.

Melochia cordata Burm. f. Fl. Ind. 143. 1768.

Melochia erecta Burm. f. Fl. Ind. 143. 1768.

Mougeotia corchorifolia (L.) H.B.K. Nov. Gen. & Sp. 5:326, adnot. 1823.

Riedleia concatenata (L.) DC. Prodr. 1:492. 1824.

Riedleia corchorifolia (L.) DC. Prodr. 1:491. 1824.

Riedleia supina (L.) DC. Prodr. 1:491. 1824.

Riedleia radiata Blume, Bijdr. 86. 1825.

Visenia concatenata (L.) Spreng. Syst. 3:31. 1826.

Visenia corchorifolia (L.) Spreng. Syst. 3:30. 1826.

Visenia supina (L.) Spreng. Syst. 3:31. 1826.

Melochia affinis Wall. Cat. no. 1198. 1829.

Melochia pauciflora Wall. Cat. no. 1199. 1829.

Polychlaena ramosa G. Don, Gen. Syst. 1:488. 1831.

Polychlaena simplex G. Don, Gen. Syst. 1:488. 1831.

?*Geruma subtriloba* Blanco, Fl. Filip. 182. 1837.

Lochemia corchorifolia Arn. Ann. Sc. Nat. sér. 2. 11:172. 1839.

Hibiscus donii Walp. Rep. Bot. Syst. 1:304. 1842.

Hibiscus endlicheri Walp. Rep. Bot. Syst. 1:304. 1842.

Melochia Burmanni Zoll. & Mor. Syst. Verz. Zoll. 27. 1846.

Melochia longibracteolata J. Ar. in Mém. Inst. Sci. Madag., sér. B. 7:66. 1956.

An annual herb or perennial subshrub, sometimes gregarious, simple or branched, erect or decumbent, a few centimeters to 2.5 meters long, the taproot not thicker than the base of the stem, the young stems sometimes hollow, with scattered stellate hairs sometimes also forked and simple, 0.1–0.7 mm. long, and also sometimes hairs in longitudinal lines about 0.5 mm. wide, internodes 2–10 cm. long; stipules 3–9 mm. long, 0.5–1.5 mm. wide, deltoid-acuminate to lanceolate-ovate, mostly ciliate, hairs mostly 0.3–1 mm. long; petiole 0.3–2.0 (–6.0) cm. long.

Lamina green, sometimes purplish, (1.0–) 2–6 (–9.8) cm. long, (0.5–) 1–2.6 (–7.0) cm. wide, ovate to lanceolate, the base usually rounded, sometimes truncate, the apex acute, both surfaces subglabrous, usually a few simple hairs 0.1–0.8 mm. long on the midrib of the upper surface and on the midrib and veins of the lower surface, the margin irregularly crenate-serrate, serrations 1–4.2 mm. wide, 0.5–1.0 mm. high, 6–10 pairs of primary veins, 2 are basal.

Inflorescence terminal, 1–2 cm. long, 0.5–3.5 cm. wide, subcapitate, rarely radiately grown out to 3 cm., consisting of about 5–25 often fragrant flowers, also sometimes at apices of branches, and rarely 1 or 2 flowers in the axils of the upper 3–5 leaves, the pedicels 0–3 mm. long; bracts 3.9–7.5 mm. long, 0.3–1.9 mm. wide, 3 or 4 immediately subtending the flower and usually 2 more below, ovate-lanceolate to nearly linear, mostly ciliate, hairs 0.2–1.0 mm. long.

Calyx pale green, 2.0–2.7 mm. long, 2.4–3.3 mm. wide, hirsute, hairs simple, 0.2–0.8 mm. long, the teeth 0.4–0.7 mm. long, 0.3–0.6 mm. wide, deltoid-acute, distant, the sinus obtuse; petals white to pink, pink or white distally and yellow proximally, rarely yellow, purple or violet 4.7–6.5 mm. long, 1.2–2.5 mm. wide, obovate to oblanceolate, almost entirely free from the staminal tube or attached to it for 0.8–0.9 mm., the claw 0–0.5 mm. long.

Androecium and gynoecium about equal in length. Stamens 2.4–3.2 mm. long, the filaments white, yellow, or green, united up to the anthers or free for 1 mm., the anther yellow, 0.6–1.0 mm. long, 0.3–0.6 mm. wide, oblong, emarginate at both ends, nearly to the middle from the apex; pistil 2.5–3.2 mm. long, the styles white or green, 1.0–1.5 mm. long, free for 0.9–1.5 mm., usually to the ovary, sometimes united for 0.4–0.6 mm., papillose for most of their length, the ovary ovoid, densely hirsute, hairs simple, 0.5–1.0 mm. long, stipe none.

Fruit green, white, pink, black, or purplish, (3.3–) 4–5 mm. long, (3.6–) 4.5–5.5 mm. wide, globular, pentagonal, the sulci between carpels very shallow, hirsute, hairs simple, 0.3–0.6 mm. long, stipe none; dehiscence first loculicidal along the dorsal suture, then along the ventral suture, eventually also septicial, the fruit falling apart; seeds 2.2–3.2 mm. long, 1.4–1.8 mm. wide, trigonal, blackish brown.

Flowering and fruiting specimens collected throughout the year but especially in late summer and fall.

TYPE LOCALITY: "Cosmop. trop." The type is in the Dillenius herbarium at Oxford University. There are two specimens in the Linnaean herbarium attributed to *Melochia corchorifolia*. The one labeled by Sir James E. Smith is *M. corchorifolia*; the other, labeled *Melochia corchorifolia* by Solander and *M. nodiflora* by Smith is *M. nodiflora*.

DISTRIBUTION: Old World tropics and subtropics, introduced in the New World. It occurs as a weed in cultivated ground, in open pineland, meadows, and in waste ground, in wet or dry sandy or clay soil, mostly at 0–250 (–1,000) meters elevation.

UNITED STATES: SOUTH CAROLINA: GEORGETOWN: Georgetown, *Godfrey & Tryon, Jr.* 1678 (US). BEAUFORT: Bluffton, *Mellichamp* s.n. (US). GEORGIA: Altamaha River, *Curtiss* 400** (MICH, US). MCINTOSH: Sapelo Island, *Duncan* 20477 (US); *McAtee* 3306 (US). FLORIDA: DUVAL: Jacksonville, *Curtiss* 6511 (US). LEE: Vicinity of Fort Myers, *J. P. Standley* 385 (US). FRANKLIN: Apalachicola, *Chapman* 4206 (US). ALABAMA: MOBILE: Mobile, *Curtiss* 6512 (US). *Mohr* s.n. (US). MISSISSIPPI: HARRISON: Biloxi, *Tracy* 4493 (MICH, US). LOUISIANA: ST. TAMMANY: Covington, Fairview, *Arsène* 11428 (US). JEFFERSON DAVIS: Lake Arthur, *Wise* s.n. (US). TEXAS: ?CHAMBERS: Stowall (?Stowell), *Hanson* 8 (US). HARRIS: Houston, *Thurrow* 14 (US). LIVE OAK: George West, *Shiller* 814 (US).

PANAMA: San José Island, Pearl Archipelago, goat farm near Rio Mato Puerco, *Erlanson* 189 (US).

BRAZIL: RIO DE JANEIRO: Environs of Rio de Janeiro and D'Ouro Preto, *Glaziou* 14518 (K). RIO GRANDE DO SUL: Gravataí near P. Alegre, *Capparelli* (PACA 48235).

CONGO: Kitobola, ?*Flamigri* 135 (S). Eala, *Corbisier* 1053 (S)? Wangota, around Coquilhatville, *Verbrun* 921 (S). Dolo, *Schlechter* 12498 (L). Lutète, *Fr. Hens* A. 280 (L). Yangambi, *Louis* 10626 (US).

KENYA: KWALE: Kivumoni, near Shimoni, *Drummond & Hemsley* 3928 (S).

TANGANYIKA: Dar-es-Salam, *Stuhlmann* 7582 (US). Lutamba See, 40 km. W. of Lindi, *Schlieben* 5372 (S).

ZANZIBAR: *Hildebrandt* 1132 (L).

NYASSALAND: *Buchanan* 73 (US). Nyassa highland, Station Kyimbila, *Stolz* 2026 (L, S).

MADAGASCAR: *D'Alleizette* 818 in part (L). Nossi-Bé, Ambanja, Mahilaka, *Waterlot* 248 (P) type of *M. longibracteolata* J. Ar.

INDIA: *Wight* 240 (L). *Koenig* (S). Malabar Concan Vc., *Stocks* (Herb. Hooker & Thomson Ind. Or.) (L). Simla, ?*D. J. Yaclar* 21 (US). Jalor (Dscharlor), *Vaughan* 592 (L). Mysore, *W. B.* 601 (L). Maisur and Carnatic, *G. Thomson* (S). BENGAL: *Hooker & Thomson* (L). *Sulp. Kurz* (US). Calcutta and vic., *Helper* 73 (L, S, US); *Wallich* 1196/D (L); *Voigt* collectors in 1834–41 (US). ASSAM: *Col. Jenkins* (L, US). TIRAP RIVER VALLEY: 12.4 mi. mark on Ledo Road, *Steinacker* U.S. Amer. Typhus Comm. 6 (S, US). TIRAP-NAMCHIK DIVIDE: 15.4 mi. mark on Ledo Road, *Juan* U.S. Amer. Typhus Comm. 320 (US). NAMCHIK RIVER VALLEY: 21 mi. mark on Ledo Road, *Juan* U.S. Amer. Typhus Comm. 523 (US).

UPPER BURMA: MYITKYINA REGION: Camp Landis area, *Juan* U.S. Amer. Typhus Comm. 120 (S, US).

BURMA and MALAY PENINSULA: Herb. of late East India Co. 620 (L). *Spiff* 620 (S).

THAILAND: SE. PART: Sriracha, *Mrs. Collins* 1880 (US).

MALAYA: SELANGOR: Kanching, Tin mines, *Nur* Singapore field no. 34419 (L, US). MALACCA: *Griffith* s.n. (L); Fish Culture Research Station, *Shah* 12 (L). JOHORE: Kg. Selantai, Mersing, *Burkill & Shah* 2503 (L). SINGAPORE: Nec Soon village, *J. Sinclair* s.n. (L).

INDOCHINA: Trian near Bienhoa, *Evrard* 57 (S), 64 (S). CAMBODIA: Pnompenh, *Godefry* 54 (L). TONKIN: Long-Tchéou, *Simond* s.n. (S).

CHINA: HAINAN: CHING MAI: Ku Tung village: Pak Shik Ling, *C. I. Lei* 750 (US), 798 (L). NGAI: Ko Leng, *Lau* 572 (US). KWANGSI: NORTHERN PART: Kwei-lin: San-min village, *Tsang* 28029 (US); Ta-chiang-yuan village, *Tsang* 28258 (US). KWANTUNG: Canton, *Levine* 1633 (US). YANG SHAN: Yang Shan (S. of Linchow), *Tsui* 624 (US). TAPU: Tung Kao Shan, *Tsang* 21732 (S). FORMOSA: *Oldham* 53 (S). Takow, *Henry* 2037 (US). KIANGSI: KIENAN: Sai Hang Cheung, *Lau* 4267 (S, US). CHEKIANG: Tien Mo Shan, *Ching Herb. U. Nanking* 9081 (US). ANHWEI: Wu Yuan, *Ching Herb. U. Nanking* 8942 (US). HUPEH: *Henry* 2315 (US).

SUNDA ISLANDS: SUMATRA: *Junghuhn* 568 (L). Atjeh, Kp. Sigleng, N. van Troeman, *Asdat* 155 (L). Lampong Estate Wai Lima, ?*Sloet* 332 (L), 460 (L). Taloe, *Bünnemeyer* 192 (L). Djambi, S. Lesing, *Posthumus* 973 (L). NORTHERN SUMATRA: Medan, *Lörzing* 13045 (L); Balige to Toba Lake, *Lörzing* 14796 (L). PADANG AND BEDAGEI: Plantation Badjalinggi, *Lörzing* 15204 (L). WEST COAST: Pajakoemboeh, *Stomps* s.n. (L); Koerintji, *Bünnemeyer* 7994 (L). W. K. G. Lago, *Bünnemeyer* 3677 (L); Padang Si Dimpoean: Padang Lawas: Tapianoeli, *Toroës* 4447 (US). EAST COAST: ASAHAN: Tandjoeng Balei, *Hamel* 1097 (S); Padang boelan, *Stomps* s.n. (L); ASAHAN: Rantau Parapat, Bila, *Toroës* 1765 (L), 1556 (US); Aer Kandis (formerly Radja Mas), *Toroës* 2424 (US); Sigamata, *Toroës* 2879 (US). SOUTHERN SUMATRA: Palembang, *Monod de Froideville* 554 (L); Pladjoe, *Rutter-Kooistra* 10 (L); BANKA: Soengei Liat, *Bünnemeyer* 1943 (L). LINGGA ARCHIPELAGO: *Bünnemeyer* 6818 (or 8187). RIOUW ARCHIPELAGO: *Bünnemeyer* 6033 (L). JAVA: *Houwink* 973 (L), 1098 (L). *Zollinger* s.n. (L). *Junghuhn* s.n. in part (L). Tanch Soereal, *Raap* 476 (L). Pasoeroean, *Kobn* ? s.n. (L). Madjinang, *Backer* 18702 (L). Kedoe Karangbolong, *Koorders* 29722 β (L). Depok, *Hallier* s.n. (L). Priok near Jakarta Canal, *Raap* 376 (L). Bogor and vic., *Hallier* 33 (L), 35a, b, c (L); *Hasselt* s.n. (L); Kampong Nangrang, *Schiffner* 2223 (L). Boerlage, *Tjiomas* s.n. (L). Bantardjaja estate, 18 km. S. of Rangkasbitung, *Buwalda* 2868 (L). PREANGER: C. Ploem, (L). Banjoemas and vic., *Kient* 1588 (L), 2694 (L), 3423 (L); *Brinkman* 587 (L); *Koorders* 22129 β (L). Semarang, *Karta* 218 (L); *Koorders* 24862 β (L). Djapara, *Koorders* 29722 β (L). Pekalongan Soeba, *Koorders* 27456 β (L). Bawean Island, *Coert* 1407 (L). MADOERA: Bangkalan, *Backer* 19023 (L). BORNEO: Poeloe-lampeï, *Korthals* s.n. (L). *Dachlan* 2422 (L). NORTH BORNEO: *Yates* 72 (US). Tamu Darat at mi. 7 on the Kota Belud, Ranau Road, *Darnton* 55 (L). SARAWAK: *Purseglove & Lundu* P. 4515 (L). CELEBES: Lasao, Eurekang, *Kjellberg* 1177 (S), 3897 (S). Bonto-Parang, *Bünnemeyer* 10556 (L). Pampanoea, *Noerkas* 78 (?75) (L), 74 (L). Menado, Gorontalo, ?*V. Gorontalo* 33a (L).

PHILIPPINES: MINDANAO: COTABATO: Marbel, Ala Valley, *Santos* 4863 (L, US); Buluan, Buluan Marsh, Barrio Siling, *Santos* 5956 (L, US). BUKIDNON: Vic. of Tanculan, *Fénix* B.S. 26003 (L, US); Bugcaon, *Cid* 24 (L). DAVAO: Davao, *De Vore & Hoover* 188 (US), *Copeland* 541 (US); Santa Cruz, *De Vore & Hoover* 238 (US), *R. S. Williams* 2755 (US). SIARGAO: *Ramos & Pascasio* B.S. 34898 (L). NEGROS: Mt. Katugasan, NW. slope of Canlaon Vol., *Edaño* 7648 (L). CULION: *Merrill* 537 (US). MINDORO: Vicinity of San José, *Lambert & Brunson* 108 (US). LUZON: San Miguel, *Hallier* s.n. (L). CAMARINES NORTE: Paracale, *Ramos & Edaño* B.S. 33625 (L). Manila, Quezon City, and vic., *Andersson* s.n. (S), *Rogerson* 1026 (US), *Merrill* 3432 (US), *Steiner* 662 (L, US), *Layosa* 71 (L). LAGUNA: Los Baños, U.S. Explor. Exped. under Capt. Wilkes (US). RIZAL: *Ramos* 1978 (L), B.S. 13554 (S). Bosoboso, *Ramos* B.S. 1469 (US), U.S. Cemetery Camp McKinley, *Steiner* 721 (L, US). UNION: Bauang, *Elmer* 5603 (US). BATAAN: Lamao River, Mt. Mariveles, *Borden* For. Bur.

1917 (US). QUEZON: Alabat Island, *Ramos & Edaño* B.S. 48000 (S). TAYABAS: Atimonan, *Whitford* 635 (US). SORSOGON: Irosin (Mt. Bulusan), *Elmer* 14495 (L, S, US). BULACAN: Angat, *Merrill* Species Blancoanae 325 (US). MOUNTAIN: Benguet, *Loher* 2029 (US). Central Luzon: *Loher* 154 (US).

MOLUCCAS: WETAR: *Bloembergen* 3631 (L). HALMAHEIRA: Kan, Kp. Koesoe, *Nedi* 462 (L). S. peninsula, Weda, *Anang* 442 (L). AMBOINA (AMBON): *Robinson* 1764 (L, US).

NEW GUINEA: Stephansort, *Nyman* 130 (S), *Lewandowsky* 56 (L). Cyclops Mts., along path to Netar, *Dreis* 142 (L). Merauke, *Verstug* 1926 (L). Finschhafen, *Weinland* 246 (L, US). Noord, *Atasrip* 202 (L). PAPUA: Koitaki Carr 12682 (L). NORTHERN DIV.: Near Gwaiari village, *Hoogland* 3669 (L, US). WESTERN Div.: Dagwa, Oriomo River, *Brass* 5958 (US); DARU ISLAND: *Brass* 6340 (L). CENTRAL DIV.: NAKEO: Baroka, *Brass* 3698 (L, US).

AUSTRALIA: NORTHERN QUEENSLAND: Townsville, *White* 8967 (US).

SOLOMON ISLANDS: BOUGAINVILLE: Karngu, Buin, *Kajewski* 2279 (L, S, US). GUADALCANAL: Vic. Tenam River and the sea, *Riley* 42 (US).

CAROLINE ISLANDS: Ponape, *Hallier* s.n. (L).

MARIANAS ISLANDS: GUAM: *Thompson* Guam Exp. Sta 240 (US).

JAPAN: KYUSHU: Kawaminami in Hyuga, *Togasi* TNS. 1429 (US). OHSUMI: Koneshime-mura, *Kawagoe* Nov. 5, 1917 (US).

This species is characterized by its subcapitate terminal inflorescence and nondimorphic flowers.

I dissected a flower from the type specimen of *M. longebracteolata* J. Ar. The petals were separate and some of the bracts were shorter than the petals. I have seen a range of hairiness in *M. corchorifolia*. Arènes considers union of petals, bracts longer than the petals, and hairiness of the bracts to be distinguishing characters of his species.

Section IV. *Pyramis* A. Goldberg, nom. nov.

Section *Eumelochia* Griseb. Fl. Brit. W. Ind. 93. 1859.

Perennial, sometimes annual, herbs to shrubs, 0.08–5.0 meters high, the root sometimes 2–5 times thicker than the base of the stem and 0.5–1.3 cm. wide, the young stems often canescent, sometimes glabrate, hairs usually stellate, sometimes simple or forked, sometimes tan, 0.1–1.6 mm. long, internodes 0.2–10 cm. long; stipules 1.5–9.0 mm. long, 0.2–3.7 mm. wide, deltoid-acute or deltoid-acuminate, lanceolate or linear, usually tomentulose and ciliate, hairs simple and usually also stellate and forked, 0.1–2.0 mm. long; petiole 0.1–5.1 cm. long.

Lamina 0.6–12.7 cm. long, 0.3–7.7 cm. wide, usually lanceolate to ovate, obovate or oval, the base rounded to cordate, or cuneate, the apex acute or rounded, rarely acuminate, the upper surface glabrous, hirsute, or tomentose and canescent, hairs stellate, forked or simple, 0.1–2.0 mm. long, the lower surface glabrous to tomentulose and canescent and woolly, hairs usually stellate, sometimes also forked and simple, rarely a few glandular, 0.1–1.6 mm. long, the margin irregularly crenate-serrate, serrations 0.7–7.0 mm. wide,

0.2–2.6 mm. high, 4–12 pairs of primary veins, usually 2 are basal.

Inflorescences usually leaf-opposed, sometimes also axillary, terminal or 90° from the leaf, 1–7 cm. long, the flowers in umbels, sometimes subcapitate, the peduncle (0–)0.1–4.0 cm. long, rarely with a primary branch 0.3–1.1 cm. long, the pedicel 1–7 mm. long; bracts 0.5–6.5 mm. long, 0.1–1.2 mm. wide, similar in shape and pubescence to the stipules.

Calyx 3.7–10.2 mm. long, 2.1–7.0 mm. wide, often tomentulose and canescent, sometimes ciliate and hirsute, hairs stellate, usually also forked or simple, 0.1–2.0 mm. long, the teeth 2.0–7.8 mm. long, 0.6–2.3 mm. wide, the sinus usually acute, sometimes narrowly rounded; petals purple, purple distally and yellow orange proximally, rose, red, violet, blue, white, or yellow, 6.0–15.5 (–17) mm. long, 1.5–5.2 (–5.7) mm. wide, usually obovate or oblanceolate, cuneate or spatulate, attached to the staminal tube for 1–5 mm., the claw 0.6–4.0 mm. long, often with scattered glandular hairs 0.05 mm. long.

Anther 0.7–2.0 mm. long, 0.4–1.0 mm. wide, oblong, slightly emarginate at both ends; staminodes rarely present, 0.1–0.2 mm. long.

Longistylous form. Stamens (2.6–) 3.5–7.0 (–9.0) mm. long, the filaments free for 0.7–3.0 mm.; pistil 4.3–10.9 (–12) mm. long, the styles free for 2–6.7 mm., united for 0.5–4.0 mm., papillose for 0.5–1.5 mm. at the apex.

Brevistylous form. Stamen 5.7–11.3 mm. long, the filaments free for 2.5–7.5 mm.; pistil 3.7–6.9 (–8.0) mm. long, the styles free for 1.4–4.0 mm., rarely free to the ovary, united for 0.5–3.0 mm., papillose for 0.3–1.0 mm. at the apex.

Fruit large, 5–10.5 (–12) mm. long, 3.8–17.0 (–22) mm. wide, pentapterous, usually pyramidal, rarely ovoid, usually rostrate and with acute, acuminate, or rounded lateral angles, the sulci between the carpels deep, extending (one-fourth to) one-third to half way to the center of the fruit, sometimes the base narrowing into a stipe 0.5–1.5 mm. long, tomentulose or hirsute-tomentulose, sometimes canescent, or subglabrous, hairs stellate, sometimes also forked, rarely also simple, 0.1–1.3 mm. long; dehiscence loculicidal all along the dorsal and ventral sutures, eventually also septicial, rarely tardily dehiscent; seeds 1.7–3.0 mm. long, 1.1–2.0 mm. wide, trigonal, brown, 1 or 2 per cell.

Flowering and fruiting period usually long, sometimes throughout the year.

LECTOTYPE: *Melochia pyramidata* L.

DISTRIBUTION: Texas and Florida to Argentina, West Indies, one species adventive in tropic and subtropic regions throughout the world, usually in open disturbed, usually dry, sometimes wet, areas, at 0–2,500 meters elevation.

40. *Melochia hermannioides* St.-Hil. Fl. Bras. Mer. 1:163, pl. 32. 1825.

Melochia parvifolia H.B.K. f. *roseiflora* Schum. & Hassl. pro parte. (Hassler no. 6402) Bull. Herb. Boiss. II, 4:70. 1903.

Melochia lacinulata Schum. & Hassl. Bull. Herb. Boiss. II, 4:69. 1903.

Melochia hermannioides St.-Hil. var. *lacinulata* (Schum. & Hassl.) Hassl. Repert. Sp. Nov. Fedde 8:122. 1910.

Melochia hermannioides St.-Hil. var. *lacinulata* (Schum. & Hassl.) Hassl. f. *heterophylla* and f. *typica* Hassl. Repert. Sp. Nov. Fedde 8:122. 1910.

?*Melochia hermannioides* St.-Hil. var. *lanceolata* Hassl. Repert. Sp. Nov. Fedde 8:122. 1910.

A procumbent or decumbent trailing subshrub or perennial herb 0.1–0.5 meter long with several (5–8) slender stems from the base, the root $2\frac{1}{2}$ to 3 times thicker than the stem, the young stems and petioles hirsute-tomentose with short stellate hairs and simple curved hairs 0.1–0.3 mm. long and forked, and straight simple hairs 1.0–1.6 mm. long, internodes 0.5–2.8 cm. long; stipules 2.2–6.5 mm. long, 0.3–1.0 mm. wide, lanceolate to linear, mostly ciliate, hairs simple, 0.2–1.2 mm. long; petiole 0.2–1.7 cm. long.

Lamina 0.9–2.1 cm. long, 0.6–1.4 cm. wide, ovate, sometimes also obovate or nearly orbicular, the base rounded to cuneate, the apex rounded, the upper surface with rather sparse simple, and sometimes also forked and stellate appressed hairs 0.2–1.5 mm. long, the lower surface similarly pubescent, stellate hairs sometimes predominant, hairs 0.2–1.2 mm. long, the margin crenate or crenate-serrate, crenations 1.0–2.6 mm. wide, 0.5–1.9 mm. high, the base entire, 4–6 pairs of primary veins, 1 or 2 are basal.

Inflorescences terminal, rarely also leaf-opposed, 1–3.2 cm. long, the ultimate divisions umbellate, 5–8 flowers per umbel, the peduncle 0–2.2 cm. long, rather slender, the pedicel 1–3 mm. long; bracts 2.0–6.0 mm. long, 0.2–0.6 mm. wide, linear to lanceolate-linear, mostly ciliate, hairs simple, 0.5–1.2 mm. long.

Calyx 5.5–8.2 mm. long, 3.1–4.8 mm. wide, hirsute and ciliate, hairs mostly simple, sometimes also forked and stellate, 0.2–1.5 mm. long, the teeth 4.2–5.6 mm. long, 1.2–2.0 mm. wide, deltoid-acuminate, the sinus acute; petals rose, blue, reddish violet, purple, or violet, rarely white, 8.4–12.8 mm. long, 2.0–4.9 mm. wide, oblanceolate-obovate-cuneate, attached to the stamens for 2.0–3.5 mm., the claw 1–3 mm. long.

Longistylous form. Stamens 5.7–6.0 mm. long, the filaments free for 1.4–2.0 mm., the anther 1.2–1.6 mm. long, 0.6–0.8 mm. wide, oblong, slightly emarginate at both ends; pistil 8.6–9.4 mm. long, the styles filiform, free for 4.2–5.1 mm., united for 1.6–2 mm., papillose for 1–1.5 mm., the ovary narrowly elliptic-ovoid, the ovary and styles up to 1 mm. of the apex covered with stellate, forked, and simple hairs 0.1–1.3 mm. long.

Brevistylous form. Stamens 7.5–8.7 mm. long, the filaments free for 5.0–5.5 mm., the anther 1.3–1.6 mm. long, 0.7–0.8 mm. wide; pistil 4.2–5.2 mm. long, the styles free for 1.5–1.8 mm., filiform, papillose for 0.5–0.8 mm., the ovary narrowly ovoid, pentagonal, hairs on the ovary and styles forked and stellate, 0.3–1.4 mm. long, stipe none.

Fruit 5.0–7.0 mm. long, of which the rostrum is 1.0–2.0 mm. long, 5.0–6.0 mm. wide, pentapterous, pyramidal, the lateral angle of the wings rounded to subacute, points above the middle of the fruit, the sulci extending a fourth to half way to the center of the fruit, pubescence stellate, forked, and simple, hairs 0.1–1.2 mm. long, the longer ones forked and simple, stipe none; dehiscence tardily loculicidal along the dorsal suture and somewhat septicidal; seeds not quite ripe, 2.4–2.9 mm. long, 1.4–1.7 mm. wide, trigonal, obovate, brownish.

Flowering and fruiting specimens collected from September to March.

TYPE LOCALITY: Province of Misiones, Argentina, in herbaceous fields. Type collected by St.-Hilaire, Cat. C₂ no. 2643; isotype cited below.

DISTRIBUTION: Bolivia to Argentina in dry clay campo, sandy herbaceous fields, on hills, at 150–2,500 meters elevation.

BOLIVIA: TARIJA: Padcaya, *Fiebrig* 2536 (L, S, US).

PARAGUAY: Cordillera de Villa-Rica, *Hassler* 8738 (K). Vicinity of Caaguazú, *Hassler* 8899 (K, S). Near Arroyo Primero (Apa), *Hassler* 8450 (S, type of *M. lacinulata* Schum. & Hassl.). Loma nördlich der Cordillera de Altos, *Fiebrig* 935 (K, L, US). Capilla Duarte near Villa-Rica, *Balansa* 2657 (K). Trinidad near Asuncion, *Rojas* 1789 (S). Est. Armonia, *Anisits* 1875 (S). Paraguari, *Grosse* A3575 (S), A3845 (S). Hiaty, *Jorgensen* 3915 (S, US). Near Tobaty, *Hassler* 6402 (S). ? Itapé, *Jorgensen* 4477 in part (S). Centurion, between Rio Apa and Rio Aquidaban, *Fiebrig* 4207 (L).

ARGENTINA: JUJUY: HUMAHUACA: La Soledad, *Venturi* 8784 (US). SALTA: *Wall* 12 (S). Salta City, N. Caseros, *Sparre* 1184 (S). FORMOSA: Colonia Clorinda, *Venturi* 9150 (US). CÓRDOBA: San Roque, *Hunziker* dupl. 7067 (S). CORRIENTES: MBURUCUYÁ: Est. Sta. Maria, *Pedersen* 510 (S, US). SANTO TOMÉ: Gob. Virasoro, *Ibarrola* 1289 (S). MTE. CASEROS: Mocoretá, *Ibarrola* 2394 (S). MERCEDES: Justino Solaricercainas, *Ybarrola* 2633 (UC). MISIONES: *St.-Hilaire* Cat. C₂, no. 2643 (P, isotype, also US neg. 5668). Posadas, Bonpland, *Ekman* 185 (S).

This species is characterized by its relatively small leaves with relatively large crenations, and by its small capsules. It is similar to *M. parvifolia* H.B.K., but the latter is an erect shrub 0.5–3 meters high with somewhat canescent young stems, and the serrations of the leaves are about a third to half as high as those of *M. hermannioides*. It is also similar to *M. anomala* Griseb., but the latter generally has larger, more densely hairy leaves and shorter peduncles (0–0.3 cm.).

Schumann (47) placed this species in the section *Mougeotia*, and in his key to the species he claimed that the inflorescence is axillary. However, the fruit is pyramidal and the inflorescence is in part leaf-opposed as in the section *Pyramis*; in the section *Mougeotia*, the fruit is subglobose and the inflorescence is axillary rather than leaf-opposed.

Hassler (23) described two varieties of *M. hermannioides*: The type of variety *lanceolata* Hassl. is Fiebrig 4207, collected at Centurion, Paraguay; the type of variety *lacunculata* (Schum. & Hassl.) Hassl. is Hassler 8450, collected near Arroyo Primero (Apa), and cited above. The variety *lanceolata* differs from the type of the species in having lanceolate leaves. I have not seen the type of this variety and withhold judgment as to whether it is distinct. I do not consider the type of the other variety to differ appreciably from the isotype of the species.

41. *Melochia parvifolia* H. B. K. Nov. Gen. & Sp. 5:325. 1823.

An erect or spreading, branched herb to shrub 0.5–3.0 meters high, the young stems and petioles somewhat canescent, hirsute-tomentulose-villous, hairs stellate, 0.2–1.0 mm. long, internodes 1.0–7.5 cm. long; stipules 2–4 mm. long, 0.4–0.9 mm. wide, deltoid-acuminate, lanceolate or nearly linear, hirsute to tomentulose, ciliate, hairs stellate, forked, and simple, 0.1–1.0 mm. long; petiole 0.1–1.3 cm. long.

Lamina relatively small, 0.6–4.5 cm. long, 0.3–2.8 cm. wide, obovate to elliptic, rarely ovate, the base cuneate or rounded, the apex rounded, the upper surface green, glabrous, subglabrous or tomentulose, hairs simple, forked, and stellate, usually 0.1 (rarely a few to 0.8) mm. long, mostly between the veins, the lower surface green, hirsute to tomentulose, hairs mostly on the veins, stellate and forked, 0.1–0.6 mm. long, puberulous between the veins, hairs 0.1 mm. long, the margin irregularly crenate-serrate, serrations 0.7–3.0 mm. wide, 0.2–1.0 mm. high, 4–7 pairs of primary veins, usually one is basal.

Inflorescences leaf-opposed, 1.3–3.8 cm. long, rarely also terminal, clusters at the upper 2–8 nodes, 3–20 flowers per cluster, umbellate-subcapitate, the peduncle 0.1–1.7 cm. long, 0.6–1.0 mm. wide, rarely branched, the pedicel 1–4 mm. long; bracts 1–4 mm. long, 0.2–0.5 mm. wide, deltoid-acuminate, lanceolate or linear, hirsute to tomentulose, ciliate, hairs simple and stellate, 0.2–0.8 mm. long.

Calyx 5.0–9.5 mm. long, 3.7–5.6 mm. wide, hirsute to tomentulose, ciliate, hairs forked, simple, and stellate, 0.1–1.0 mm. long, the teeth 3.3–5.0 mm. long, 1.2–1.8 mm. wide, deltoid- to ovate-acuminate, the sinus acute to narrowly rounded; petals usually white, sometimes yellow or rose, rarely pale lilac, 7–11.5 mm. long, 2.5–4.8 mm. wide, obovate- to oblanceolate-spatulate or oblanceolate-cuneate, sometimes

with scattered glandular hairs 0.05 mm. long, attached to the staminal tube for 2–3 mm., the claw 1–3 mm. long.

Longistylous form. Stamens 4–5.8 mm. long, the filaments free for 1–2.5 mm., the anther 1.1–1.5 mm. long, 0.5–0.7 mm. wide, oblong, slightly emarginate at both ends, more so at the base; pistil 7.5–9.5 mm. long, the styles free for 3.4–4.5 mm., united for 1.5–3.5 mm., papillose for 1 mm. at the apex, the ovary ellipsoid to elliptic-ovoid, slightly pentagonal, the ovary and styles tomentulose, hairs stellate and forked, 0.1–0.5 mm. long, the stipe 0–0.5 mm. long.

Brevistylous form. Stamens 8–9.5 mm. long, the filaments free for 5–6.8 mm., the anther 1.1–1.7 mm. long, 0.6–0.7 mm. wide, shape the same as that above; pistil 5–5.7 mm. long, the styles free for 1.6–2.2 mm., united for 1.0–1.7 mm., papillose for 0.5–1.0 mm. at the apex, the ovary ellipsoid, occasionally of 6 carpels, hirsute or sericeous-tomentulose, the styles hirsute to their separation, hairs stellate, 0.2–0.8 mm. long, stipe none.

Fruit 5–7 mm. long of which 1–2 mm. is rostrum, 4.2–7.2 mm. wide, pentapterous, pyramidal, the sulci extending one-third of way to the center of the fruit, the angles of the wings near the middle of the fruit, short, acute to rounded, hirsute-tomentulose, hairs simple, forked, and stellate, 0.2–0.8 mm. long, stipe none; dehiscence loculicidal along the dorsal and ventral sutures; seeds 2–2.7 mm. long, 1.2–1.7 mm. wide, trigonal, obliquely obovate, brown to black, one per cell.

Flowering and fruiting specimens collected throughout the year.

Key to Varieties of *M. parvifolia*

1. Lamina subglabrous, hairs mostly simple, base usually cuneate.
 - 41a. *M. parvifolia* var. *parvifolia*
 - 1 Lamina hairier, sometimes lower surface tomentulose, hairs mostly stellate and forked, base more frequently rounded than in the typical variety.
 - 41b. *M. parvifolia* var. *fasciculata*
- 41a. *Melochia parvifolia* H. B. K. var. *parvifolia*
 ? *Melochia parviflora* Loud. Hort. Brit. 269. 1830.
Melochia scordiifolia Turcz. Bull. Soc. Nat. Mosc. 31(1):207. 1858.
Melochia parvifolia α *normalis* O. Ktze. Rev. Gen. 3(2):25. 1898.
Melochia parvifolia β *Esperanzae* O. Ktze. Rev. Gen. 3(2):25. 1898.
Melochia parvifolia H.B.K. var. *genuina* Hassl. Repert. Sp. Nov. Fedde 8:120. 1910.
Melochia parvifolia H.B.K. var. *genuina* Hassl. f. *induta* Hassl. Repert. Sp. Nov. Fedde 8:120. 1910.
Melochia obovata Urb. Symb. Ant. 9:233. 1924.

The typical variety is sparsely hairy; the leaves are small, the lamina generally not exceeding 2.5 cm. in length and 1.3 cm. in width, and the base is usually cuneate.

TYPE LOCALITY: The type was collected by Humboldt in an arid region near Caracas, Venezuela.

DISTRIBUTION: Cuba and northern South America to Argentina, most commonly in savanna, also in campo and in cultivated and fallow land, in dry or moist places, in sandy or serpentine soil, and among granite rocks, at 0–1,400 meters elevation, mostly at lower elevations.

CUBA: ORIENTE: Santiago de Cuba, Siboney, *Bro. Clemente* 7005 (US). Santiago de Cuba, Vista Alegre, *Acuña & Morton* 3896 (US). Near Santiago de Cuba, *Ekman* 7694 (S, type of *Melochia obovata* Urb., also US neg. 5605), 8894 (S, isotype *M. obovata* Urb.). Siboney, *Morton* 3957 (US). Near El Cobre, *Bro. Clemente* 6285 (US); *Bro. León* 16773 (US).

BRITISH GUIANA: RUPUNUNI: Ireng River, 45 mi. N. of Lethem, *Irwin* 833 (US).

VENEZUELA: ?Cerro del Galipan, *Eggers* 13192 (L.) Lower Orinoco, Sacupana, *Rusby & Squires* 36 (MICH, R, S, US). Orinoco Delta, Cano del Uricoa-San Antonio, *Bond et al.* 134 (US). Las Trincheras, *Warming* 267 or 266 (US). Cumanacoa, *Mocquerys* 764 (US). "Venezuela, etc.," *Funck & Schlim* 564 (LE, and US neg. 5268, isotype of *Melochia scordiifolia* Turcz.). GUÁRICO: La Rubiera near Calabozo, *Grisol* 38 (US). Cordoncito, *Gines* 4121 (US). MIRANDA: Los Chorros, *Eggers* 13092 (US). Rio Chico, *Jahn* 1223 (US). Higueroite, *Gines* 4585 (US). FEDERAL DISTRICT: Caracas, *Humboldt*, F neg. 9807 of the type (US). Near Caracas, Middle Cotiza, *Pittier* 7213 (US). Around Caracas, San Lázara, *Pittier* 9746 (US). Around Caracas, *Pittier* 6171 (US). Sabana de Conejo Blanco, El Valle, *Fernández* 120 (US). ARAGUA: La Trinidad de Maracay, *Pittier* 5796 (US), 5820 (US). Maracay, *Vogl* 337 (S). Near colony of Tovar, *Fendler* 112 (GH). CARABOBO: Puerto Cabello, *Suringar* Mar. 1885 (L). ?CARABOBO: Puerto Cabello, *Kuntze* 1719 (US). COJEDÉS: Culebra Lagoon near S. Carlos, *Pittier* 11705 (US). APURE: Llanos del Alto-Apure, Hato Metapalo, *Jahn* 205 (US). Puerto Páez, *Valez* 2698 (US). Rio Meta, La Ochovera, *Cuatrecasas* 4183 (US). BOLÍVAR: Ciudad Bolívar, *Holt & Gehriger* 114 (US), 140 (US). Ciudad Bolívar and vicinity on the Orinoco, *L. H. & E. Z. Bailey* 1626 (US). Between Ciudad Bolívar and Rio Pao, *Killip* 37214 (US). Morichal Sta. Isabel, *Cardona* 699 in part (US). El Palmar, *L. Williams* 12869 (US).

COLOMBIA: ATLÁNTICO: Barranquilla and vicinity, *Fosberg* 21424 (US); *Bro. Elias* 109 (US), 178 (US), 274 (US), 995 (US), 1324 (US); *Dugand* 5437 (US), 5437 B (US), 5437 C (US). Usiacuri, *Dugand & Garcia Barriga* 2313 (US). Between Palmar de Varela and Poncedera on the banks of the Rio Magdalena, *Dugand & Garcia Barriga* 2541 (US). Between Sabanalarga and Campeche, *Dugand & Jaramillo* 2762 (US). Vicinity of Galapa and Baranoa, *Dugand & Jaramillo* 3269 (US). VICHADA: Puerto Carreño on the Rio Orinoco, *Cuatrecasas* 4067 (US).

BRAZIL: Western part, *Tamberlik* (W). RIO BRANCO: *Ule* 7971 (L, US). São Jorje, Rio Flexa, *Fröes* 23129 (US). SURUMU: Serra do Mel, *Ule* 8226 (L). AMAZONAS: S. Marcos, *Luetzelburg* 20509 in part (R), 20510 in part (R). GOIÁS: Porto Real to Santa Anna, *Burchell* 8856 (L), 9083 (L). MATO GROSSO: Cuiabá, ? *Riedel* 793 (K); *Malme* s.n. (S). Coxipó da Ponte, Cuiabá, *Hoehne* 3024 (R, US), 3025 (R). Porto Esperidião, *Hoehne* 775 (R). Corumbá, *Hoehne* 4839 (R), 4875 (R).

PARAGUAY: Rio Paraguay, ? Toncière, *Sandeman* 4873 (K). Alto-Paraguay, Chaco 21° S. lat., *Fiebrig* 1215 (S). Near Concepcion, *Hassler* 7399 (S). Road to "Yerbales" montium "Sierra de Maracayú," *Hassler* 4989 (S, W).

ARGENTINA: TUCUMÁN: MONTEROS: Kilometro 1220, *Herrera* 161 in part (S).

This species is close to *Melochia hermannioides* St.-Hil., but the latter is procumbent or decumbent and small, whereas *M. parvifolia* is generally erect and can be a tall shrub. The leaves of *M. hermannioides* are broader, rounder, and have larger teeth, and the flowers are rose, blue, purple or violet rather than generally white. The inflorescences of *M. hermannioides* are more frequently terminal and less frequently leaf-opposed. The species is also close to *Melochia morongii* Britt., but the latter has longer and narrower leaves which are hairier on the lower surface, and the apex is acutely pointed rather than rounded; the peduncles of *M. morongii* are longer. It is also related to *Melochia anomala* Griseb., but the leaves of the latter are generally larger, generally ovate rather than obovate, the serrations are larger, and the base rounded rather than often cuneate. The flowers are usually rose, blue, purple or violet rather than usually white.

41b. *Melochia parvifolia* H.B.K. var. *fasciculata* (Benth.) Hassl. Repert. Sp. Nov. Fedde 8:121 1910.

Melochia fasciculata Benth. in Hook. Journ. Bot. 4:127. 1841.

Melochia parvifolia H.B.K. f. *albiflora* Schum. & Hassl. Bull. Herb. Boiss. II, 4:70. 1903.

Melochia parvifolia H.B.K. var. *fasciculata* (Benth.) Hassl. f. *microphylla* Hassl. Repert. Sp. Nov. Fedde 8:121. 1910.

Melochia parvifolia H.B.K. var. *fasciculata* (Benth.) Hassl. f. *microphylla* Hassl. subf. *transiens* Hassl. Repert. Sp. Nov. Fedde 8:121. 1910.

Melochia parvifolia H.B.K. var. *fasciculata* (Benth.) Hassl. f. *typica* Hassl. Repert. Sp. Nov. Fedde 8:121. 1910.

This variety has hairier leaves, particularly on the lower surface, and the hairs are generally stellate and forked rather than simple. The lamina is often larger and the base is rounded rather than cuneate.

TYPE LOCALITY: The syntypes were collected by Schomburgk, no. 738, at Pirara, British Guiana, by Gardner, no. 2068 (?2060) in Piauí, Brazil, and by Blanchet, no. 2750, at Utinga, Belém, Pará, Brazil. Schomburgk no. 738 is cited below.

DISTRIBUTION: British Guiana, northern Brazil, and Paraguay in dry savannas, on rather humid cultivated areas, at about 200 meters elevation.

BRITISH GUIANA: Pirara, *Schomburgk* 738 (L, US, syntype of *Melochia fasciculata* Benth.), also F neg. 35379 ex P of *Schomburgk* 738 (US).

BRAZIL: AMAZONAS: Serra das Guaribas, *Luetzelburg* 21950 (R). Passarão, Rio Araricuera, *Luetzelburg* 20573 in part (R).

PARAGUAY: Colonia Risso near Rio Apa, *Malme* 1048 (S, US). Fuerte Olimpo, *Anisits* 2107 (S).

42. *Melochia morongii* Britt. Ann. New York Acad. Sci. 7:62. 1890.

Melochia Morongii Britt. var. *denudata* Fries, Svensk. Vet. Akad. Handl. 42(12):9. 1908.

Melochia parvifolia H.B.K. var. *Morongii* (Britt.) Hassl. Repert. Sp. Nov. Fedde 8:121. 1910.

Melochia parvifolia H.B.K. var. *Morongii* (Britt.) Hassl. f. *genuina* Hassl. Repert. Sp. Nov. Fedde 8:121. 1910.

Melochia parvifolia H.B.K. var. *Morongii* (Britt.) Hassl. f. *genuina* Hassl. subf. *denudata* (R. E. Fries) Hassl. Repert. Sp. Nov. Fedde 8:121. 1910.

Melochia parvifolia H.B.K. var. *Morongii* (Britt.) Hassl. f. *intermedia* Hassl. Repert. Sp. Nov. Fedde 8:121. 1910.

Melochia parvifolia H.B.K. var. *Morongii* (Britt.) Hassl. f. *tomentosa* Hassl. Repert. Sp. Nov. Fedde 8:122. 1910.

A branched, erect subshrub 0.3–0.6 meter high with 2–5 stems from the base, the root 0.8 cm. wide, 2–5 times as thick as the base of the stems, the young stems and petioles canescent, tomentose, hairs slender, stellate, 0.5–1.3 mm. long, internodes 2–6 cm. long; stipules 3.0–6.8 mm. long, 0.3–0.5 mm. wide, deltoid-acuminate, linear or lanceolate, mostly ciliate, hairs simple, 0.3–1.2 mm. long, a few forked and stellate, 0.2 mm. long; petiole 0.5–2.0 cm. long.

Lamina tomentulose, sometimes glabrescent, 2.0–7.5 cm. long, 0.8–3.0 cm. wide, ovate to lanceolate, the base rounded, the apex acute to rounded, the upper surface greenish or canescent, tomentulose, hairs simple, appressed, forked, and stellate, 0.1–1.0 mm. long, the lower surface canescent, tomentulose, hairs stellate, 0.3–0.7 mm. long, woolly to the touch, the margin irregularly crenate-serrate, serrations 1–5 mm. wide, 0.3–1.2 mm. high, 5–10 pairs of primary veins, 1 or 2 are basal.

Inflorescences leaf-opposed, 2.5–7.0 cm. long, sometimes also axillary, 1–1.5 cm. long, at 2–4 nodes, and terminal, extending 3–3.6 cm. beyond the first leaf, in subcapitate umbels, 5–12 flowers per umbel, the peduncle usually fairly long, 0.7–4.0 cm. long, 0.6–1.4 mm. wide, sometimes with a branch 1 cm. long, the pedicel 2–5 mm. long; bracts 1.5–5.0 mm. long, 0.1–0.3 mm. wide, linear, ciliate and tomentulose, hairs simple, forked, and stellate, 0.2–1.1 mm. long.

Calyx 6.7–10.2 mm. long, 4–5 mm. wide, densely tomentulose, hairs stellate and forked, 0.1–1.0 mm. long, the teeth 4.5–7.8 mm. long, 1.3–1.7 mm. wide, lanceolate- to deltoid-acuminate, the sinus acute to slightly rounded; petals blue, purple, lilac, or dirty white, 9.5–11.5 mm. long, 2.0–3.8 mm. wide, obovate-ob lanceolate or obovate-oblong, attached to the stamens for 1–3.3 mm., the claw 1–3 mm. long, sometimes glandular hairs 0.05 mm. long scattered over both surfaces.

Longistylous form. Stamens 5.5 mm. long, the filaments free for 2.0–2.3 mm., the anther 1.3–1.4 mm. long, 0.7 mm. wide, oblong, slightly emarginate at both ends; pistil 10.5 mm. long, the styles free for 4.5–6.5 mm., united for 1.5–4.0 mm., filiform, papillose for 1.5 mm. at the apex, the ovary and styles tomentulose, hairs stellate, 0.2–0.5 mm. long, the ovary ovoid, stipe none.

Brevistylous form. Stamens 8.1–10.5 mm. long, the filaments free for 6.0–7.5 mm., the anther 1.3–1.8 mm. long, 0.5–0.8 mm. wide, shape the same as that above, staminodes sometimes present, 0.1–0.2 mm. long; pistil 5.0–6.5 mm. long, the styles free for 1.5–2.5 mm., united for 1–2 mm., filiform, papillose for 0.7–1.0 mm. at the apex, the ovary elliptic-ovoid, united parts of the styles and upper part of the ovary hirsute-tomentulose, hairs stellate and forked, 0.2–1.0 mm. long.

Fruit 6–7 mm. long, of which the rostrum is 1.5–2.0 mm. long, 4.0–5.8 mm. wide, pentapterous, pyramidal, the wings short, points near the middle of the fruit, angle acute to rounded, the sulci extending a fourth to half way to the center of the fruit, tomentulose, hairs stellate, 0.1–0.6 mm. long, the stipe of glandular tissue 0–0.3 mm. long; dehiscence loculicidal all along the dorsal suture; seeds 2.4–2.6 mm. long, 1.5–1.7 mm. wide, brown, one per cell.

Flowering and fruiting specimens collected from October to February.

TYPE LOCALITY: The type was collected by Morong, no. 201a, at Asunción, Paraguay, and is cited below.

DISTRIBUTION: Southwestern Brazil, Paraguay, and Misiones, Argentina, in grassy fields, in a valley, on cultivated land, and on calcareous campo, at 220–225 meters elevation.

BRAZIL: MINAS GERAIS: Ituiutaba, *Macedo* 1034 (US). Goiás: Jataí, Balsam, *Macedo* 1504 (US).

PARAGUAY: *Anisits* 2731 (S). Est. Santa Maria, *Anisits* 2529 (S, type of *Melochia morongii* Britt. var. *denudata* R. E. Fries, also U.S. neg. 5613). Est. Tagatiya, *Anisits* 2640 (S). Asunción, *Morong* 201a (NY, type; US, isotype). Along road between Caacupé and Tobaty, *Archer & Rojas* 4864 (US). Rio Apa, *Hassler* 7744 (S, W). Centurion, between Rio Apa and Rio Aquidaban, *Fiebrig* 4620 (L). CANTERA: Colonia Alborada, *Montes* 3254 (US). GRAN CHACO: On the western bank of the River Paraguay, *Hassler* 2406 (K), 2406a (K).

ARGENTINA: MISIONES: CANDELARIA: Loreto, *Montes* 24B (US); *Ekman* 178 (US).

Fries (15) made the variety *denudata* on the basis of the glabrescent nature of the leaves of some specimens. There is considerable variation in the vestiture of the leaves, but I consider the transition from one type to another to be too gradual to warrant making a variety based on vestiture alone. Hassler (23) considered *M. morongii* to be a variety of *M. parvifolia* H.B.K., and he described three forms in the

variety. The leaves of *M. morongii* are generally ovate to lanceolate, those of *M. parvifolia* are usually obovate to elliptic. The leaves are usually larger and usually hairier than those of *M. parvifolia*. The peduncle is usually longer than that of *M. parvifolia*. *Melochia parvifolia* is a taller plant and its flowers are usually white rather than usually colored.

The species is also related to *M. anomala* Griseb., but the inflorescences and peduncle are shorter in the latter species, and the serrations of the leaves are usually larger.

43. *Melochia anomala* Griseb. Abh. Wiss. Goett. 19:93. 1874.

PLATE 7

A more or less erect shrub 0.5–1 meter high with several (4) stems from the base, the root thickened, 0.5–1.0 cm. wide, twice the diameter of the stem, the young stems and petioles usually lightly tomentose-hirsute, somewhat canescent, hairs simple, forked, and stellate, 0.3–1.4 mm. long, internodes 1–5.5 cm. long; stipules 3.5–6.0 mm. long, 0.2–0.9 mm. wide, deltoid-acuminate, lanceolate, or nearly linear, ciliate, also a few simple hairs, rarely also forked on the abaxial surface, 0.3–1.2 mm. long; petiole 0.2–2.5 cm. long.

Lamina 1–6 cm. long, 0.8–4.0 cm. wide, ovate, ovate-lanceolate, lanceolate, or oblong, the base rounded, the apex rounded to acute, the upper surface green, covered with appressed simple hairs, rarely also forked and stellate, 0.2–1.3 mm. long, the lower surface lightly tomentose, slightly canescent, hairs usually simple, forked, and stellate, 0.3–1.2 mm. long, the margin irregularly crenate-serrate almost to the base, serrations 1–3.8 mm. wide, 0.4–2.5 mm. high, 6–7 (–10) pairs of primary veins, 2 are basal.

Inflorescences leaf-opposed at 3–6 upper nodes, in subcapitate umbels 1–1.3 (–3.0) cm. long, 3–7 (–12) flowers per umbel, the peduncle 0–0.5 (–2.3) cm. long, the pedicel 1–2 mm. long; bracts 3–5.5 mm. long, 0.2–0.5 mm. wide, linear to lanceolate, mostly ciliate, few hairs on the abaxial surface, hairs simple, 0.2–1.3 mm. long.

Calyx 7–7.5 mm. long, 5.6–6.0 mm. wide, tomentose-canescant, also ciliate, hairs simple, forked, and stellate, 0.1–1.3 mm. long, the teeth 5–6 mm. long, 1.2–1.8 mm. wide, deltoid- to lanceolate-acuminate, the sinus narrowly rounded; petals violet, purple, rose, blue, rarely whitish, 9.8–10.5 mm. long, (1.7–) 3.5–3.9 mm. wide, usually obovate, with scattered glandular hairs 0.05 mm. long, attached to the staminal tube for 2–3 mm., the claw 1–2.5 mm. long.

Longistylous form. Stamens 5.4–5.7 mm. long, the filaments free for 1.6–2.5 mm., the anther 1.3–1.6 mm. long, 0.6–1.0 mm. wide, oblong, slightly emarginate at both ends; pistil 7.8 mm. long, the styles filiform, free for 3.4–3.7 mm., united for 2 mm., papillose for 0.8–1.0 mm., the ovary ovoid, mostly upper part with forked and

stellate hairs 0.3–1.0 mm. long, and stellate hairs 0.2 mm. long nearly to the tips of the styles.

Brevistylous form not seen.

Fruit (5–) 6.5–8.0 mm. long, of which the rostrum is 2.0–2.5 mm., (5.5–) 6.2–7.0 (–9.0) mm. wide, pentapterous, pyramidal, the angle of wing acute, about the middle of the fruit, the sulci extending one-third the way to the center of the fruit, tomentulose, hairs stellate, 0.1–0.5 mm. long, a few forked, up to 0.7 mm. long, stipe none; dehiscence loculicidal along the dorsal suture; seeds (not ripe) 2.5 mm. long, 1.5 mm. wide, obovate, trigonal, brownish, one per cell.

Flowering specimens collected from October to April; fruiting ones, from October to May.

TYPE LOCALITY: On hills exposed to the sun near Malagueño, Córdoba, Argentina. Type collected by Lorentz, no. 503, cited below.

DISTRIBUTION: Bolivia and Argentina on slopes of hills in red soil, campo, uncultivated, dry, hard land, at 100–1,200 meters elevation.

BOLIVIA: SANTA CRUZ: *Weddell* 3588 (P). Cabezas (Cordillera), *Peredo* 39 (UC), 260 (UC). A. IBAÑEZ: La Guardia, *Krapovickas* 9038 (LIL). TARIJA: *Fries* 1135 (S).

ARGENTINA: SALTA: ANTILLAS: Cerro Negro, *Venturi* 10292 (A, S, US). ORÁN: Tartagal, *Schreiter* 3893 (S). Abra Grande, *Venturi* 5519 (GH, S, US). La Cantera, *Pierotti* 205 (UC). La Calera, *Pierotti* 197 (UC). At foot of hill E. of Salta, *Bartlett* 19722 (US). "Monte" at Experiment Station, Coronel Moldes, *Bartlett* 19668 (US). Capital, San Lorenzo, *Venturi* 5085 (A, US). Joaquin V. González, *Aguilar* 257 (UC). TUCUMÁN: BURROYACO: El Puestito, *Venturi* 7529 (S, US). El Timbó, *Venturi* 2430 (US). RIO CHICO: La Cocha, *Bailetti* 9 (S). CAPITAL: Rio Sali, *Venturi* 2756 (A, US). ?Mataderos, *Venturi* 2190 in part (US). TRANCAS: Tapia, *Venturi* 2360 (A, US). Road to S. Pedro de Colalao, *Venturi* 4219 (US). CRUZ ALTA: Campo Alegre, *Venturi* 2012 (US). Las Cajas, *Venturi* 2108 (US). SANTIAGO DEL ESTERO: C. PELLEGRINI: Carro del Remate, *Venturi* 5972 (GH, US). CHACO: Border of Rio Las Garzas, *E. R. Wagner* s.n. (P). NAPALFÍ: Pampa del Infierno, *Buratovich* 525 (W). CÓRDOBA: *Kuntze* Dec. 1891 (NY). F neg. 9596 ex. B of *Lorentz* 110 (US). Malegueño, foothills of Córdoba, *Lorentz* 503 (GOET, type, also US neg. 5239). Pueblo Güemes, *Ruiz de Huidobri* 413 (UC). PUNILLA: San Roque, *Hunziker* dupl. 5997 (S).

This species is closely related to *M. hermannioides* St.-Hil., but *M. anomala* has larger leaves and usually shorter peduncles. The entire plant is hairier, particularly the leaf and calyx. It is also related to *M. parvifolia* H.B.K., but it has larger, hairier leaves with larger serrations.

44. *Melochia werdermannii* A. Goldberg, sp. nov.

PLATE 8

Suffrutex, utrinque valde tomentosus molle incanus, pilis stellatis, 0.3–1.0 mm. longis praeditus; petiolis 1–1.7 cm. longis; laminis foliorum 4.5–7.0 cm. longis, 2.2–4.9 cm. latis, ovatis vel aliquatenis rotundatis; inflorescentiis oppositifoliis, cymoso-umbellatis, umbellis 5–15 floris, pedunculis brevis et crassis, 0.2–0.8 cm. longis, 1.2–1.5

mm. latis, pedicellis brevis, 1.5–2.5 mm. longis; calycibus 7–9.2 mm. longis; fructibus perangustatis, 6–7 mm. longis, 3.8–4.8 mm. latis, pentapteris, pyramidatis, angustatis ad basin, alis perangustatis, acuminibus lateralibus rotundatis vel subacutis, sessilibus; dorsaliter plene loculicide vix septicide dehiscentibus.

An erect, usually branched suffrutex, the young stems and petioles densely tomentose, canescent, hairs stellate, 0.5–1.0 mm. long, internodes 2–6 cm. long; stipules 4–6.5 mm. long, 0.5–0.8 mm. wide, lanceolate, densely tomentose, hairs stellate, 0.2–0.5 mm. long; petiole 1–1.7 cm. long.

Lamina 4.5–7.0 cm. long, 2.2–4.9 cm. wide, lanceolate-ovate to ovate, sometimes also suboblong, the base rounded, the apex acute to somewhat rounded, both surfaces densely tomentose, canescent, hairs stellate, 0.3–0.5 mm. long, velvety to the touch, the margin irregularly crenate-serrate, serrations 1–6 mm. wide, 0.3–1.6 mm. high, 10–12 pairs of primary veins, 2 are basal.

Inflorescences 1–2 cm. long, leaf-opposed, at 5–9 nodes, umbellate, 5–15 flowers per umbel, the peduncle short and relatively thick, 0.2–0.8 cm. long, 1.2–1.5 mm. wide, the pedicel 1.5–2.5 mm. long; bracts 2–5.3 mm. long, 0.2–0.6 mm. wide, linear to lanceolate, tomentose, hairs stellate, few forked and simple, 0.2–1.8 mm. long.

Calyx 7–9.2 mm. long, 4.3–5.5 mm. wide, densely tomentose, canescent, hairs stellate, 0.2–0.7 mm. long, the teeth 4.7–5.7 mm. long, 1.7–2.3 mm. wide, deltoid- to ovate-acuminate, or sublanceolate, the midrib often prominent, the sinus acute to narrowly rounded; petals 7.5–10.8 mm. long, 1.5–3.4 mm. wide, obovate-ob lanceolate, attached to the staminal tube for 2.5–3.0 mm., the claw 1.5–3.0 mm. long, with scattered glandular hairs 0.05 mm. long, faint indication of purple or rose in the dried condition.

Longistylous form. Stamens 4.7–5.8 mm. long, the filaments free for 1.7 mm., the anther 1.5 mm. long, 0.8 mm. wide, oblong, slightly emarginate at both ends; pistil 7.2 mm. long, the styles free for 3.2 mm.

Brevistylous form. Stamens 7–10 mm. long, the filaments free for 4.0–6.5 mm., the anther 1.6–1.8 mm. long, 0.6–0.9 mm. wide, shape same as that above; pistil 5.2–5.7 mm. long, the styles filiform, free for 1.5–1.8 mm., united for 0.5–1.5 mm., stigmatic for 0.3–0.7 mm., the ovary ovoid, considerably narrowed at the base, tomentulose, hairs stellate, 0.2–0.3 mm. long.

Fruit narrow, 6–7 mm. long, 3.8–4.8 mm. wide, narrowed toward the base, the rostrum 1.2–2.0 mm. long, pentapterous, pyramidal, the wings very narrow, outer angle of the wing slightly below the middle of the fruit, rounded to subacute, the sulci between the carpels

extending a fifth to a third of way to the center of the fruit, tomentulose, hairs stellate, 0.2–0.3 mm. long, stipe none; dehiscence loculicidal all along the dorsal suture, sometimes tardily so, very slightly septicial; seeds 2.4–2.9 mm. long, 1.4–1.6 mm. wide, obovate, trigonal, brown, 1 per cell.

Flowering and fruiting specimens collected in February and October, few fruits present in the latter month.

TYPE LOCALITY: Misiones Guarayos-Santa Cruz de la Sierra, Santa Cruz, Bolivia. The type was collected by Werdermann, no. 2606, and is cited below.

DISTRIBUTION: Santa Cruz, Bolivia, at 250–300 meters elevation.

BOLIVIA: SANTA CRUZ: Misiones Guarayos-Santa Cruz de la Sierra, Werdermann 2606 (S, type, also US neg. 5607). **CHIQUITOS:** Roboré, Krapovickas 9190 (LIL).

This species differs from the other densely stellate-tomentulose, canescent species of this section in having the following combination of characters: Very narrow fruits, short, thick peduncles, and a relatively large lamina, velvety to the touch. It is most closely related to *M. anomala*.

45. *Melochia illicioides* Schum. in Mart. Fl. Bras. 12(3):31. 1886.

Melochia decandra "Willd." ex Schum. in Mart. Fl. Bras. 12(3):31. 1886, in synonymy.

A simple or branched erect suffrutex up to 1 meter high, the young stems tomentulose-canescant, hairs stellate, 0.1–0.2 mm. long, internodes 1–8 cm. long; stipules caducous, 1.7 mm. long, 1 mm. wide, deltoid-acute, tomentulose, hairs stellate, 0.1 mm. long; petiole 0.4–3.3 cm. long.

Lamina 2–5.2 cm. long, 1.2–3.6 cm. wide, lanceolate to lanceolate-ovate, the base subcordate, the apex acute, the upper surface greenish-canescant, tomentulose, hairs stellate, 0.1 mm. long, the lower surface canescant, tomentulose, hairs stellate, 0.1–0.2 mm. long, both surfaces velvety to the touch, the margin irregularly crenate-serrate, serrations 1.2–6.0 mm. wide, 0.5–1.6 mm. high, 8 pairs of primary veins, 2 are basal.

Inflorescences at the upper 3–7 nodes, apparently axillary and leaf-opposed at the same node, or one cluster at a node, 1.5–3.0 cm. long, apparently sometimes also terminal, extending 1.7 cm. beyond the first leaf, umbellate, 3–6 flowers per umbel, the peduncle 0.4–1.5 (–2.5, Schum.) cm. long, sometimes with a primary branch 0.5–1.1 cm. long and a secondary branch 0.5 cm. long, the pedicel 1.7–4.0 mm. long; bracts 1–1.7 mm. long, 0.2–0.5 mm. wide, lanceolate to nearly linear, tomentulose, hairs stellate, 0.1 mm. long.

Calyx 5.2 mm. long, 4.2 mm. wide, tomentulose-canescens, hairs stellate, 0.1–0.2 mm. long, also a few glandular granules and glandular hairs 0.1–0.2 mm. long, the teeth 3–3.5 mm. high, 1.5 mm. wide, deltoid-acuminate, the sinus acute to slightly rounded; petals white, 9–9.7 mm. long, 2 mm. wide, oblanceolate, the claw 3–4 mm. long, united to the staminal tube for 2.7 mm.

Longistylous form. Stamens 5.5 mm. long, the filaments free for 1.5 mm., the anther 1.1 mm. long, 0.7 mm. wide, oblong, emarginate at both ends; pistil 9 mm. long, the styles filiform, free for 5.5 mm., united for 1 mm., papillose for 0.8 mm. at the apex, the ovary pentagonal-ovoid, tomentulose, hairs stellate, 0.1–0.2 mm. long, the styles with scattered hairs up to the stigmas.

Brevistylous form (according to Schumann). Stamens 8 mm. long, the filaments filiform, free for 6 mm., the anther 1.5 mm. long, deeply divided, divergent above; pistil 4 mm. long, the ovary setose at the apex, the styles flat and free (in one specimen 6), the apex clavate, slightly thickened, glabrous.

Fruit relatively large, 1–1.2 cm. long, 1.9–2.2 cm. wide, chartaceous, pentapterous, pyramidal, truncate at the apex or with a short rostrum 1 mm. long, the outer angle of wings basal, rounded and mucronate for 0.2 mm., or acute, the sulci between the carpels extending half way to the center of the fruit, stipe none, but the base of the capsule stipelike for 0.5 mm., sometimes 6–7 carpels; dehiscence loculicidal along the dorsal and ventral sutures; seeds (Schumann) 2.5 mm. long, compressed, black, glabrous, chalaza large, cinereous-fuscous.

TYPE LOCALITY: Bahia State, Brazil, near Barra da Vareda. Type collected by Prinz zu Wied-Neuwied, number 2.

DISTRIBUTION: Bahia, Brazil, and Honda, Colombia (Schumann), in forest and along roads.

BRAZIL: F neg. 9604 ex B (US). BAHIA: Maritiba, *Blanchet* 3472 (NY).

This species can be distinguished from other species by its relatively large capsules that are chartaceous rather than somewhat indurate and truncate or very shortly rostrate rather than long rostrate. It is perhaps most closely related to *Melochia betonicifolia* St.-Hil.

The collection of the specimen photographed as F 9604 ex B is attributed to Poeppig, no. 2519, but Schumann (47) cited Poeppig 2519 as *M. littoralis* (Poepp. & Endl.) Schum. The photograph fits the description of *M. illicioides* Schum., and the specimen was identified as such by Schumann. Since there is a number 2 pasted on the specimen sheet, the specimen may have been collected by Prinz zu Wied-Neuwied, number 2, which is the only Brazilian collection of this species mentioned by Schumann (47).

46. *Melochia betonicifolia* St.-Hil. Fl. Bras. Mer. 1:165. 1825.

Melochia nepetoides St.-Hil. Fl. Bras. Mer. 1:165. 1825.

Melochia cordiformis St.-Hil. Fl. Bras. Mer. 1:166. 1825.

A branched, erect suffrutex to frutex, 0.45–4.0 meters high, the young stems and petioles tan-canescens, tomentulose, hairs stellate, 0.1–1.0 mm. long, internodes 0.3–5.0 cm. long; stipules 1.7–8.0 mm. long, 0.4–3.7 mm. wide, deltoid-acuminate or deltoid-acute or lanceolate, tomentulose on the abaxial surface, also ciliate, hairs simple, forked, and stellate, 0.1–1.2 mm. long; petiole 0.5–4.4 cm. long.

Lamina 2.5–8.0 cm. long, 1.2–5.8 cm. wide, ovate to lanceolate, the base rounded to cordate, the apex acute, the upper surface green, hirsute-tomentulose, hairs stellate, forked, and simple, 0.1–0.5 (–0.8) mm. long, the lower surface greenish or slightly to considerably canescens, tomentulose, hairs stellate, 0.1–0.6 mm. long, velvety or rough to the touch, the margin irregularly crenate-serrate, serrations 1.1–7.0 mm. wide, 0.5–2.6 mm. high, (5–) 7–10 pairs of primary veins, 2 (1–3) are basal.

Inflorescences 1.3–4.7 cm. long, usually axillary at the upper 2–5 nodes, rarely also terminal and leaf-opposed, sometimes on short axillary branches, the clusters in subcapitate umbels of 5–20 flowers, the peduncles (0.2–) 0.8–2.9 cm. long, 1–1.2 mm. wide, rarely with a branch 0.2 cm. long, the pedicel 1–3.7 mm. long; bracts 1–4.5 mm. long, 0.2–1.2 mm. wide, deltoid-acuminate or deltoid-acute to lanceolate and linear, hirsute-tomentulose and ciliate, hairs simple, forked, and stellate, 0.1–0.8 mm. long.

Calyx 6–8.3 mm. long, 4.5–6.0 mm. wide, canescens, densely tomentulose, hairs stellate and sometimes also forked, 0.1–0.3 (–1.0) mm. long, the teeth 3.3–5.3 mm. long, 1.5–2.4 mm. wide, deltoid to ovate, acuminate or acute, the sinus acute to rounded; petals white, yellow or purple, 7.5–12.5 mm. long, 2–4.5 mm. wide, oblanceolate- or obovate-cuneate, attached to the staminal tube for 1–4.5 mm., the claw 2–3 mm. long.

Longistylous form. Stamens 5.5–7.1 mm. long, the filaments free for 0.7–1.5 mm., the anther 1.1–1.4 mm. long, 0.5–0.7 mm. wide, oblong, slightly emarginate at both ends; pistil 8.4–10.4 mm. long, the styles filiform, free for 4.3–6.7 mm., united for 1–2 mm., papillose for 0.7–1 mm. at the apex, the ovary ellipsoid-ovoid, the styles and ovary hirsute-tomentulose, hairs stellate, forked and simple, 0.1–0.6 mm. long, sometimes 7 carpels present, the stipe 0.1 mm. long.

Brevistylous form. Stamens 6.5–10.2 mm. long, the filaments free for 2.5–6.0 mm., the anther 0.8–1.4 mm. long, 0.6–0.8 mm. wide; pistil 5–5.2 mm. long, the styles free for 2–4 mm., united for 1–2.8 mm., slightly clavate and stigmatic for 0.5–0.7 mm., the styles and ovary tomentulose, hairs stellate, 0.2–1.0 mm. long.

Fruit sometimes with 8 carpels, 6.7–8.5 mm. long, 2.5 mm. being rostrum, 11.5–17 mm. wide, pyramidal, pentapterous, the points of wings acuminate, tomentulose, hairs stellate, 0.2–1.0 mm. long, the capsule narrowed at the base for 1 mm., the stipe 0.5 mm. long; dehiscence loculicidal along the dorsal and ventral sutures; seeds 2.5–2.7 mm. long, 1.6–1.8 mm. wide, brown.

Flowering specimens collected from December to February, April to June, and in August and September; fruiting ones, in February, April, August, and September.

TYPE LOCALITY: The type was collected by St.-Hilaire near the praediolum Bom Jardim, not far from the praesidio called S. Miguel de Jiquitinhonha in Minas Gerais, Brazil, commonly in caatinga woods where the leaves are shed every year. The isotype is cited below.

DISTRIBUTION: Northern and eastern Brazil in caatinga woods in which the leaves are shed during the hot and dry season, at low elevations (50 meters).

BRAZIL: CEARÁ: Four km. S. of Mecejana, *Cutler* 8393 (US). Fortaleza, Aldeota, *Ducke* 2377 (US). PERNAMBUCO: Paqueta, *Pickel* 1504 (US). BAHIA: Maracás, *Ule* 6967 (K, L). S. Thome, *Blanchet* 3791 (P). ?BAHIA: Coração, *Blanchet* 3306 (NY, P). MINAS GERAIS: S. Miguel da Jequitinhonha, *St.-Hilaire* cat. B₁ 1561 (P, isotype), also F neg. 35377 ex P (US). Near S. Domingos, *St.-Hilaire* cat. B₁ 1579 (P, type of *Melochia cordiformis* St.-Hil., also F neg. 35378 ex P [US]). Rivulet Sucuriú, *St.-Hilaire* 1405 (P, isotype of *Melochia nepetoides* St.-Hil., also F neg. 35384 ex P (US)). Arassuahy near Rio Manso, *Glaziou* 13557 (P), in part (R). RIO DE JANEIRO: Environs of Rio de Janeiro, *Glaziou* 13557 (K). Serra da Estrella, *Glaziou* 12459 (R).

This species is similar to *M. tomentosa* L., but generally more robust; the inflorescences generally contain more flowers, often white or yellow; the pedicels are usually shorter. It is also related to *M. caracasana* Jacq.; the inflorescence is usually leaf-opposed in *M. caracasana*, but usually axillary in *M. betonicifolia*. The capsules are generally wider in *M. betonicifolia* than in *M. caracasana*.

M. betonicifolia, *M. nepetoides*, and *M. cordiformis* were published at the same time. In combining them, in accordance with the International Code of Botanical Nomenclature (33), I select *M. betonicifolia* as the correct name.

47. *Melochia caracasana* Jacq. Coll. 2:369. 1788.

Melochia macrophylla H.B.K. Nov. Gen. & Sp. 5:324. 1823.

Mougeotia caracasana (Jacq.) H.B.K. Nov. Gen. & Sp. 5:329. 1823.

Riedleia Caracasana (Jacq.) DC. Prodr. 1:492. 1824.

Visenia caracasana (Jacq.) Spreng. Syst. 3:30. 1826.

An erect, branched shrub, sometimes herb, 0.45–5.0 meters high, the young stems sordid canescent, densely tomentose, hairs stellate, 0.3–1.0 mm. long, internodes 1–9 cm. long; stipules 2–7 mm. long,

1.2–2.0 mm. wide, deltoid-acute to deltoid-acuminate, tomentose and ciliate, hairs simple and forked, 0.2–1.0 mm. long; petiole 0.5–5.1 cm. long.

Lamina 1.4–12.7 cm. long, 0.8–7.7 cm. wide, lanceolate-ovate to ovate, the base rounded to cordate, the apex usually acute, the upper surface green, sparsely to densely puberulous, hairs stellate, forked and simple, 0.4 (0.2–0.9) mm. long, the lower surface yellowish-tan-canescens, tomentose, hairs stellate, 0.3–0.8 mm. long, both surfaces woolly to the touch, the margin irregularly crenate to crenate-serrate, crenations or serrations 2–5 mm. wide, 0.7–2.0 mm. high, 5–10 pairs of primary veins, 2 are basal.

Inflorescences 1–3 cm. long, leaf-opposed, axillary, or both, at the upper 2–6 nodes, apparently sometimes also terminal, the clusters in rather dense subcapitate umbels of 3–20 flowers, the flowers fragrant, the peduncle thick, 0.4–2 cm. long, 0.8–1.4 mm. wide, sometimes with a branch 0.3–0.5 cm. long, the pedicel 1–4 mm. long; bracts 1.8–6.0 mm. long, 0.2–1.0 mm. wide, deltoid-acute to deltoid-acuminate, or linear, tomentose.

Calyx 5–8 mm. long, 3.5–6.0 mm. wide, sordid canescent and tomentulose, hairs stellate, 0.3 (–2.0) mm. long, the teeth 2.5–6.0 mm. long, 0.8–2.0 mm. wide, deltoid-acute to deltoid-acuminate, sometimes with rounded sides, the sinus usually acute; petals white to yellow and brownish, 6–10 mm. long, 1.5–2.6 mm. wide, oblanceolate to obovate, spatulate, attached to the staminal tube for 1.5–1.8 mm., the claw 1 mm. long.

Longistylous form. Stamens 5.0–6.5 mm. long, the filaments free for 1–3 mm., the anther 1.4–1.7 mm. long, 0.5–1.0 mm. wide, oblong, emarginate at both ends; pistil 7.2–10 mm. long, the styles filiform, free for 4.5–6.0 mm., united for 1.6 mm., papillose and slightly clavate for 0.5–1.0 mm. at the apex, the ovary ovoid to ellipsoid, slightly pentagonal, hirsute at the apex, hairs stellate, forked and simple, 0.2–0.7 mm. long, the stipe 0–0.8 mm. long.

Brevistylous form. Stamens 7–8.5 mm. long, the filaments free for 4–5.5 mm., the anther 0.8–1.6 mm. long, 0.4–0.7 mm. wide, ellipsoid, ovoid, or oblong and emarginate at both ends; pistil 4–6.5 mm. long, the styles 1.5–2 mm. long, free to the ovary.

Fruit 7–10 mm. long, 2 mm. is rostrum, 6–11 mm. wide, pyramidal, pentapterous, the points of wings usually basal, usually recurved and acute to acuminate, rarely blunt, usually canescent, densely pubescent, hairs stellate, up to 0.5 mm. long, the stipe 0–1 mm. long; dehiscence loculicidal along the dorsal suture; seeds 2.2–2.7 mm. long, 1.1–1.5 mm. wide, trigonous, brown, sometimes striate.

Flowering and fruiting specimens collected in May, June, and August to December.

TYPE LOCALITY: The type was collected by Jacquin near Caracas, Venezuela, and is cited below.

DISTRIBUTION: Northern Venezuela, Colombia and Brazil, in thickets, on open, dry, rocky hillside, in ravines, or in savannas, at 0–1,700 meters elevation.

VENEZUELA: SUCRE: F neg. 35383 ex P of type of *Melochia macrophylla* H.B.K. (US). **MIRANDA:** Petare and vicinity, near Caracas, *Pittier* 7146 (US). **FEDERAL DISTRICT:** Caracas, *Jacquin* (W, type); *van Landsberge* 253 (S); *Pittier* 6149 (US). El Valle, *Fernández* 154 (US). On road to La Guaira from Caracas, between Catia and Las Trincheras, *E. Pittier* 12 (US). Lower Cotiza, *Pittier* 7178 (US). Turmerito, Ingomar, *Killip* 37728 (US). El Paraiso, Caracas, *Lasser* 744 (US). Between Caracas and La Guaira, *Mr. & Mrs. J. N. Rose* 21820 (US). On the old road from Caracas to La Guaira, *Pittier* 9545 (US). La Guaira, *André* 109 (NY). ?**FEDERAL DISTRICT:** Valle, *van Landsberge* Nov. 1847 (S). El Valle and Laguna de Espino, *Eggers* 13130 (L, US). **ARAGUA:** Maracay, *Vogel* 340 (S). Colonia Tovar, *Fendler* 109 (P, US). **CARABOBO:** Hacienda Taborda, near El Palito, on the road from Valencia to Puerto Cabello, *Pittier* 7666 (US). Puerto Cabello, Valle Seco, *Engstedt* 3 (S). El Palito, Valencia, *Warming* 264 (US). **LARA:** Near Barquisimeto, *Saer* 26 (US). **MÉRIDA:** *Mocquerys* 1234 (US).

COLOMBIA: MAGDALENA: Santa Marta, *Dawe* 500 (US). **SANTANDER:** Río Suratá valley, near Bucaramanga, *Killip & Smith* 16226 (US).

BRAZIL: CEARÁ: *Allemão & de Cysneiros* 134 (R, US).

This species is similar to *M. tomentosa* L., but generally larger and more robust; the inflorescences generally contain more flowers, white or yellow rather than purple; the peduncles are thicker; the pedicels are usually shorter; the leaves have longer hairs. It is also similar to *M. betonicifolia* St.-Hil., but the inflorescence is most commonly axillary in *M. betonicifolia* and usually leaf-opposed in *M. caracasana*. The leaves of *M. caracasana* are usually hairier than those of *M. betonicifolia* and the hairs are yellowish rather than white.

It is illustrated by Jacquin (32).

48. *Melochia lanata* St.-Hil. Fl. Bras. Mer. 1:167. 1825.

Melochia lanata St.-Hil. var. *inclusa* St.-Hil. Fl. Bras. Mer. 1:167. 1825.

An erect, branched suffrutex, at least 0.4 meter high, the young stems and petioles densely lanate, canescent, hairs stellate and apparently forked and simple, 0.2–1.6 mm. long, internodes 2–7 cm. long; stipules 4.1–7.0 mm. long, 0.2–0.5 mm. wide, lanceolate to sub-linear, mostly ciliate, some hairs on the abaxial surface, most simple, some forked, 0.4–2.0 mm. long; petiole 0.5–1.5 cm. long.

Lamina 2–5.5 cm. long, 1–3.4 cm. wide, ovate, ovate-lanceolate, lanceolate, oval or elliptic-oblong, the base rounded, the apex rounded or acute, the upper surface sericeous-tomentose, lanate, hairs yellowish-tan-canescant, simple, appressed, 0.5–2.0 mm. long, the lower surface densely lanate, yellowish- to tan-canescant, hairs stellate, forked, and simple, 0.7–1.6 mm. long, the margin irregularly and mostly shallowly

crenate-serrate, serrations 0.8–3.9 mm. wide, 0.3–1.3 mm. high, 7–9 pairs of primary veins, 2 are basal.

Inflorescences 2–5 cm. long, leaf-opposed, 90° from the leaf, or axillary, 3–15 flowers in dense subcapitate, umbellate clusters at 3–6 upper leaf nodes, 1 or 2 clusters per peduncle, the peduncle 0–3 cm. long, 1.2 mm. wide, the pedicel 2–4 mm. long; bracts 2.5–6.5 mm. long, 0.2–0.3 mm. wide, sublinear to linear, lanate-tomentose and ciliate, hairs mostly simple, few forked, 0.3–1.8 mm. long.

Calyx 6.8–9.2 mm. long, 4.7–5.2 mm. wide, lanate-tomentose on the outside, hairs stellate, forked and simple, 0.2–1.5 mm. long, the teeth 3.8–5.8 mm. long, 2–2.2 mm. wide, ovate- to deltoid-acuminate, the sinus acute; petals 8.6–14 mm. long, 2.2–2.5 mm. wide, oblanceolate, with scattered glandular hairs 0.05 mm. long, attached to the staminal tube for 3.5–3.7 mm., the claw 1.5–2.5 mm. long.

Longistylous form not seen.

Brevistylous form. Stamens 7.7–10.8 mm. long, the filaments free for 5–6.5 mm., the anther 1.2–1.7 mm. long, 0.6–0.8 mm. wide, oblong, slightly emarginate at both ends; pistil 5.2–5.5 mm. long, the styles filiform, stigmatic for 0.8 mm., free for 2–2.2 mm., united for 1–1.2 mm., the ovary ovoid to ellipsoid, the upper half of the ovary and base of the styles tomentose-sericeous, hairs forked and stellate, 0.2–1.3 mm. long, stipe none.

Fruit not seen.

Flowering specimens collected from September to November.

TYPE LOCALITY: Sertão near Olho d'Agua, Minas Gerais, Brazil, isotype cited below.

DISTRIBUTION: In herbaceous fields in the desert part of Minas Gerais, Brazil.

BRAZIL: MINAS GERAIS: Near Olho d'Agua, *St.-Hilaire* (P, isotype, also US neg. 5661); F neg. 35382 ex P of type or isotype. Rico Pares?, *Vincent* 818 (L).

The position of the inflorescence, often leaf-opposed, and the relatively long attachment of the petals to the staminal tube indicate that this species belongs to the section *Pyramis*. *M. lanata* var. *inclusa* St.-Hil. appears to be the longistylous form of the species. The species appears to be closest to *M. caracasana* Jacq., but differs considerably from it in vestiture.

49. *Melochia tomentosa* L. Syst. ed. 10, 1140. 1759.

Usually a shrub or subshrub, rarely an herb, 0.3–4.0 meters high, slender, erect or spreading, usually branched, sometimes several branches from the base, perennial, sometimes flowering the first year, the root sometimes thicker than the base of the stem, the bark of the stem blackish or purplish, the young stems and petioles tomentulose,

usually canescent, hairs stellate, 0.1–0.2 mm. long, internodes 0.8–5.5 cm. long; stipules sometimes deciduous, 2–9 mm. long, 0.4–1.5 mm. wide, deltoid-acuminate or deltoid-acute to nearly linear, densely tomentulose, sometimes also ciliate, hairs stellate, sometimes also simple and forked, 0.1–0.3 (–0.7) mm. long; petiole 0.3–2.0 (–3.0) cm. long.

Lamina (1.2–) 2–6 (–10) cm. long, 0.7–4.0 (–5.0) cm. wide, ovate to lanceolate, rarely suborbicular, the base rounded, subcordate, rarely also subtruncate or subcuneate, the apex acute to rounded, both surfaces usually tomentulose, sometimes hirtellous, usually canescent, sometimes only the lower, or neither surface canescent, hairs stellate, 0.1–0.5 mm. long, the margin irregularly crenate or crenate-serrate, crenations or serrations 0.7–5.0 mm. wide, 0.3–2.0 mm. high, (5–) 6–9 (–11) pairs of primary veins, usually 2 are basal, the veins impressed above, prominent beneath.

Inflorescences usually axillary, 1.5–5.0 cm. long, sometimes also leaf-opposed, 2–3 cm. long, or terminal, extending 3–3.2 cm. beyond the first leaf, umbellate, 2–10 (–20) flowers per umbel, at (1–) 3–9 upper nodes, sometimes at 2–3 naked nodes, the peduncle 0.3–2.5 (–5.0) cm. long, 0.5–0.6 mm. wide, rarely with a branch 0.5 cm. long, rarely two in an axil, the pedicel 2–5.7 mm. long; bracts 1–6.1 mm. long, 0.1–0.7 mm. wide, shape and pubescence like those of the stipules.

Calyx green, rarely dull red distally, 4.9–8.6 mm. long, 3.2–7.0 mm. wide, densely tomentulose, canescent, hairs stellate, sometimes also glandular, 0.1–0.3 mm. long, the teeth 2.8–5.8 mm. long, 0.7–2.2 mm. wide, deltoid or ovate, acute or acuminate, the sinus acute to rounded; petals purple, pink, violet, blue, sometimes paler proximally, rarely red or white, 8–13.5 (–17) mm. long, 2.0–3.8 (–6.4) mm. wide, oblanceolate- to obovate-cuneate and spatulate, attached to the stamens for 2.8–5.4 mm., the claw 1.7–3.0 mm. long, sometimes united for 2 mm.

Longistylous form. Stamens 4–6.5 (–9.0) mm. long, the filaments free for 1.8–2.7 mm., the anther 1.1–1.2 mm. long, 0.6–0.8 mm. wide, oblong, emarginate at both ends; pistil 7–10.9 (–12) mm. long, the styles free for 3.2–6.0 mm., united for 3 mm., papillose and slightly clavate for 0.7–1.5 mm. at the apex, the ovary and usually the base of the styles tomentulose, hairs stellate, 0.1–0.4 mm. long, the ovary ellipsoid to ovoid, the stipe 0–1 mm. long.

Brevistylous form. Stamens 7–12.2 mm. long, the filaments free for 2.5–6.3 mm., the anther 0.9–1.5 mm. long, 0.5–0.9 mm. wide; pistil 4.5–5.5 (–8.0) mm. long, the styles free for 1.5–2.6 mm., united for 1.5–3.0 mm., papillose for 0.4–1.0 mm. at the apex, the ovary

and base of styles densely tomentulose, hairs stellate, 0.1–0.6 mm. long, the ovary ellipsoid, the stipe 0–2 mm. long.

Fruit 6.5–10.5 mm. long, 6.6–10.5 mm. wide, long-rostrate, the rostrum 1.3–5.0 mm. long, pyramidal, sometimes suboblong, pentapterous, the lateral points of wings at or below the middle of the fruit, rather short, acute or rounded, the sulci extending a third to half way to the center of the fruit, the base of the fruit narrowed into a stipe 1–1.5 mm. long, tomentulose, hairs stellate, forked, 0.1–0.6 mm. long; dehiscence loculicidal all along the dorsal and ventral sutures, eventually also septicial; seeds 2–3 mm. long, 1.1–2.0 mm. wide, obovate, red-, purple-, chocolate-, or light-brown, sometimes longitudinally striate, sometimes canescent at the ends and along the raphe, 1 or 2 per cell.

Flowering and fruiting specimens collected throughout the year.

Key to Varieties of *M. tomentosa*

1. Lamina green on both surfaces, hispidulous; petals often large, sometimes 15–17 mm. long; plant very slender; inflorescences at few nodes.

49d. *M. tomentosa* var. *speciosa*

1. Lamina canescent and tomentulose at least on the lower surface; petals up to 13.5 mm. long; plant usually robust; inflorescences often at many nodes.

2. Upper surface of lamina green, lower canescent, serrations relatively few and broad 49c. *M. tomentosa* var. *turpiniana*

2. Upper and lower surfaces of lamina canescent, serrations relatively numerous and narrow.

3. Leaves medium-sized, lamina typically 2–6 cm. long, 0.7–4.0 cm. wide, petiole often more than 1 cm. long.

49a. *M. tomentosa* var. *tomentosa*

3. Leaves small, lamina typically 1–3 cm. long, up to 2 cm. wide, petiole less than 1 cm. long; stems much more branched and canescent for a shorter distance from the apex than in the typical variety.

49b. *M. tomentosa* var. *frutescens*

49a. *Melochia tomentosa* L. var. *tomentosa*

Melochia crenata Bert. ex. Spreng. Syst. 3:29. 1826; not Vahl 1794.

Melochia portoricensis Spreng. Syst. 3:29. 1826.

Melochia plicata Presl, Rel. Haenk. 2:145. 1835.

Melochia hypoleuca Miq. Linnaea 22:468. 1849.

Ridleia hypoleuca (Miq.) Walp. Ann. 2:166. 1852.

Melochia tomentosa L. var. *typica* Schum. in Mart. Fl. Bras. 12(3):34. 1886.

?*Melochia tomentosa* L. var. *Bahiensis* Schum. in Mart. Fl. Bras. 12(3):34. 1886.

Melochia arida Rose, Contr. U.S. Nat. Herb. 8:321. 1905.

Melochia tomentosa (L.) Britt. Brooklyn Bot. Gard. Mem. 1:69. 1918.

Sida rajoides M. E. Jones, Extracts from Contr. West. Bot. 18:58. 1933.

The leaves of the typical variety are tomentose and canescent on both surfaces. The lamina is typically 2–6 cm. long and 0.7–4.0 cm. wide.

TYPE LOCALITY: Jamaica. There are two specimens of *M. tomentosa* in the Linnaean herbarium. One appears to be *M. tomentosa* var. *tomentosa* and the other *M. tomentosa* var. *frutescens*. Localities of collections are not given.

DISTRIBUTION: Southern Florida, southern Texas to Nicaragua, West Indies, Venezuela, Colombia, Surinam, and northeastern Brazil to Bahia, usually in dry, open places, on rocky limestone hills, in coastal thorn thickets, savanna, pineland, along the roadside, in granite sand, in loam, on volcanic slopes, at 0–1,250 meters elevation, usually below 500 meters.

UNITED STATES: FLORIDA: DADE: Buena Vista, *Small* 7268 (S, US). TEXAS: HIDALGO: Mission, *Shiller* 644 (US).

MEXICO: S. Augustin, *Liebmann* 11880 (US). LOWER CALIFORNIA: Cerralvo, *Rose* 16889 (US). Loreto, above Primera Agua, *Jones* 27167 (US), 27170 (US). Aguaje de San Esteban 25 mi. N. of San Ignacio, *Nelson & Goldman* 7205 (US). About 5–10 mi. W. of San Ignacio, *Wiggins* 5443 (MICH, US); *Thomas* 8330 (US). About 26–27 km. NW. of San Ignacio, *Carter et al.* 1967 (US), 2519 (US). Forty mi. E. of San Ignacio, *Shreve* 7056 (MICH). From Agua Colorado to Cerro Colorado, *Nelson & Goldman* 7321 (US). Carmen Island, *E. Palmer* 823 in 1890 (US). Isla Partida, *Collins et al.* 150 (US). North of Comondu, *Wiggins* 5476 (MICH, US). Forty mi. NE. of Pozo Alemán, *Wiggins* 7817 (US). Northeast of Pozo Alemán, *Shreve* 6984 (MICH). Two mi. E. of Pozo Alemán, *Epling & Robinson* s.n. (MICH). About 28 mi. S. of Pozo Alemán, *Wiggins* 7876 (US). San Jose de Magdalena, *Wiggins* 11381 (US). Magdalena Island, *Brandege* s.n. (US); *Orcutt* 46 (US). San Nicholas Bay, *Johnston* 3734 (US). Puerto Escondido, *Johnston* 3853 (US). Cerralvo Island, Gordas Point, *Johnston* 4033 (US). La Paz and vicinity, *Collins et al.* 56 (US), 60 (US); *E. Palmer* 121 in 1890 (US); *Hammerly* 208 (US); *Shreve* 7201 (MICH). Between La Paz and Santo Domingo, *Thomas* 8452 (US). Between Santonio and Puerto de Bahia de los Muertos, *Wiggins* 5637 (MICH, US). Todos Santos, *Jones* 24108 (MICH). San José del Cabo and vicinity, *Brandege* s.n. (US); *Thomas* 7761 (US); *Purpus* 318 in part (US); *Carter et al.* 2194 (US); *Dawson* 1191 (MICH). Cape San Lucas, *Rose* 16360 (US); *Xantus* 13 (US). SONORA: Guaymas, *Rose et al.* 15015 (GH, US); *Rose* 1205 (US, type of *Melochia arida* Rose); *Drouet & Richards* 4029 (MICH); *Gentry* 4714 (MICH). Bahia San Carlos, *Dawson* 1062 (MICH). TAMAULIPAS: *Viereck* 641 (US). Matamoros, *Runyon* 423 (US). Buena Vista Hda., *Wootton* s.n. (US). San Miguel La Tamaulipeca, *Bartlett* 10585 (MICH), 10679 (MICH, US). El Limon, *Kenoyer & Crum* 3637 (MICH). Victoria, *Leavenworth* 240 (GH). SINALOA: Vicinity of Culiacan, *Ortega* 6691 (US). Altata, *Gentry*, 5437 (MICH). DURANGO: *Rose* 2272 (US). ZACATECAS: San Juan Capistrano, *Rose* 2413 (US). SAN LUIS POTOSÍ: Las Palmas, *Rose & Hough* 4880 (US). Valles, *Kenoyer* s.n. (MICH). NAYARIT: TRES MARIAS ISLANDS: Maria Madre Island, *Nelson* 4205 (US); Tepic, Cañon de Jesus Maria, *Goldsmith* 145 (GH). VERA CRUZ: Zacuapan, Barranca de Santa Maria, *Purpus* 2357 (US); *Rozynski* 608 (R). Baños del Carrizal, *Purpus* 6134 (US). PUEBLA: San Luis Tultitlanapa near Caxaca, Rio de Santa Lucia, *Purpus* 2612 (US). MICHOACÁN: APATZINGAN: Tiquiluca, *Hinton* 12121 (US). COLIMA: *E. Palmer* 956 in 1891 (MICH, US). GUERRERO: Acapulco and vicinity, *Bailey* 514 (MICH); *Haenke* (PR 174399a, b, c, type of *Melochia plicata* Presl, also US neg. 5550, W, isotype); *E. Palmer* 258 in 1894–95 (MICH, US). OAXACA: Near Tomellin, *Rose et al.* 10083 (US).

Tomellin Canyon, *J. N. & J. S. Rose* 11330 (US). Estacion Almoloyas, Cañon de Tomellin, *Conzatti* 1685 (US), 2034 (MICH). Playa de Coyula, *Reko* 3664 (US). "Cancatlan" (?Cuicatlán), *Rusby* 64 (US). Vicinity of San Juan Guichicovi, *Nelson* 2716 (US). Ixtepec, *Fisher* 35467 (US). San Geronimo, *Mell* 2111 (US), 2147 (MICH). Cuicatlán, *Gonzalez* 978 (US). Estacion de Quiotepec, *Conzatti* 4588 (US). Salina Cruz and vicinity, *King* 209 (MICH); *Deam* s.n. (MICH). Tehuantepec and vicinity, *Matuda* 923 (MICH); *King* 862 (MICH), 441 (MICH), 346 (MICH). About 5.5 km. NE. of Juchitán, *King* 364 (MICH). CAMPECHE: Konchen, *Lundell* 1388 (MICH). YUCATÁN: Balantun, *Gaumer* 23267 (US). Chichankanab, *Gaumer* 1799 (US). Mérida, *Collins* 13 (US); *Souza Novelo* 259 (US). Progreso, *Steere* 3029 (MICH). Muna, *Steere* 2136 (MICH). QUINTANA ROO: Coba on bank of aguada W. of Lake Coba, *C. L. & A. A. Lundell* 7670 (MICH, US).

HONDURAS: CORTES: Rio Lindo, *Edwards* P-698 (US).

NICARAGUA: MANAGUA: Managua and vicinity, *Garnier* 1168 (MICH, US); *Chaves* 72 (US). GRANADA: Granada, *Baker* 213 (MICH).

BAHAMAS: Eleuthera, Harbor Island, *E. G. Britton* 6387 (US). NEW PROVIDENCE: Near Nassau, *Curtiss* 12 (L, US). ANDROS: Coppice, Smith Hill, Long Bay Cays, *Small & Carter* 8666 (US). EXUMA CHAIN: Great Guana Cay, *Britton & Millspaugh* 2877 (US).

CUBA: CAMAGÜEY: Vicinity of Pueblo Romano Cayo Romano, *Shafer* 2437 (US). Six mi. from NE. end of Cayo Coco, *Shafer* 2728 (US). Paloma, Cayo Sabinal, *Shafer* 816 (US). Cayo Guajaba, *Shafer* 640 (US). ORIENTE: Northward of Raimon, Nipe Bay, *Shafer* 1784 (US). Santiago and vicinity, *Taylor* 17 (US). *Lopez Figueiras* 189 (US). Siboney, *Morton* 3970 (US). Yateritas, Via Azul, *Bro. Alain & Morton* 4949 (US). Manigua costera, en el Socucho, Playa de Puerto Padre, *López F* 2906 (US).

HAITI: Port-au-Prince and vicinity, *Leonard* 2816 (US); *Bailey* Haiti 132 (US), Haiti 283 (US). TORTUE ISLAND: Vicinity of La Vallée, *E. C. & G. M. Leonard* 11647 (MICH, US), 15406 (US). GONAVE ISLAND: Pte. à Raquette, *Eyerdam* 223 (US). Vicinity of Étroite and Anse Galette, *Leonard* 3112 (US), 3351 (US). Gonaïves and vicinity, *Nash & Taylor* 1546 (US); *Buch* 283 (L, S); *Leonard* 10061 (US). Vicinity of St. Raphael, *Leonard* 7692 (US). Vicinity of Jean Rabel, *E. C. & G. M. Leonard* 13829 (US). Vicinity of Mole St. Nicholas, *E. C. & G. M. Leonard* 13210 (US). Vicinity of Cabaret, *E. C. & G. M. Leonard* 12016 (US). Vicinity of Fond Parisien, Etang Saumatre, *Leonard* 4117 (US), 4132 (US). Vicinity of St. Marc, *Leonard* 2876 (US).

DOMINICAN REPUBLIC: *C. Wright et al.* 45 (US), 108 (US). Azua, *Rose et al.* 4024 (US). SANTIAGO: Guayacanal, *Jiménez* 2263 (US). MONTE CRISTI: Guayubin, *Abbott* 941 (US). BARAHONA: *Fuertes* 382 (US).

JAMAICA: Kingston and vicinity, *Killip* 11 (US); *Maxon & Killip* 1385 (US), 308 (US). Near Falmouth, *W. Harris* 7222 (US). Near Alligator Pond, *W. Harris* 7230 (US). Watsons Hill, *W. Harris* 6315 (US). Long Mountain Road, *Fawcett* 7313 (US). East slope of Hellshire Hills, *Proctor* 7502 (US). Port Henderson, *J. A. Harris & Lawrence* C1537 (US). GRAND CAYMAN ISLAND: *Proctor* 15054 (IJ).

PUERTO RICO: Cayo Muertos, *Britton et al.* 4971 (US). San Ildefonso, *Goll et al.* 701 (US). Coamo, *Sintenis* 3150 (US).

LESSER ANTILLES: U.S. VIRGIN ISLANDS: ST. CROIX: Bassin, *Ricksecker* 127 (US). ST. JOHN: Near Lamosure, *Britton & Shafer* 644 (US). MARTINIQUE: *Duss* 1360 (US). *H. & M. Stehlé* 6861 in part (US). *Sieber* 321 (L). Case Pilote, *Hahn* 248 (GH, L, US), 240 (R). GRENADA: St. George, *Broadway* in 1896 (US).

DUTCH WEST INDIES: CURAÇAO: Various localities, *Suringar*, Jan. 1885 (L). Near Willemstad, *Britton & Shafer* 2913 (US). BONAIRE: *Suringar* Feb. 20-23, 1885 (L). Rineon, *Boldingh* 7010 (L). ARUBA: Koolwijk, *Suringar* Jan.-Feb. 1885 (L).

TRINIDAD: Patos Island, *Broadway* 2716 (S).

VENEZUELA: Valley of Puerto La Cruz, Hacienda Panarigua, *Pittier* 9199 (US). NUEVA ESPARTA: MARGARITA ISLAND: El Valle, *Miller & J. O. Johnson* 44 (US). SUCRE: Vicinity of Cristóbal Colón, *Broadway* 133 (US). FEDERAL DISTRICT: Around Caracas, *Pittier* 6170 (US). Lower Cotiza, near Caracas, *Pittier* 7257 (US). Vicinity of Cabo Blanco, *Pittier* 10274 (US). La Guaira, *Curran & Harman* 846 (US), 876 (US). Catia de la Mar, *Tamayo* 399 (US); *Vogl* 617 (S). ARAGUA: Colonia Tovar, *Fendler* 107 (US). CARABOBO: El Palito, on road from Valencia to Puerto Cabello, *Pittier* 7668 (US). FALCÓN: Paraguaná, Pueblo Nuevo, *Tamayo* 1033 (US). MÉRIDA: Breckenio Hacienda 23 mi. SE. of Mérida, *Reed* 547 (US). Vallée du Rio Chama, en aval d'Egido, *Humbert* 26537 (P, US). BOLÍVAR: Ciudad Bolívar, *Holt & Gehriger* 85 (US), 100 (US); *L. H. & E. Z. Bailey* 1508 (US).

COLOMBIA: MAGDALENA: Santa Marta, *Curran* s.n. (US). Near Fonseca, *Haught* 4311 (US). Cerrejón, *Haught* 6639 (US). ATLÁNTICO: Barranquilla, *Bro. Elias* 134 (US). BOLÍVAR: Vicinity of Cartegena, *Bro. Heriberto* 9 (US). NORTE DE SANTANDER: Vicinity of Cúcuta, *Killip & Smith* 20981 (US); *Molina & Barkley* 18 N. S. 011 (US).

BRAZIL: PIAUÍ: Sete Lagoas, *Lützelburg* 1476 (RB). CEARÁ: Motuquinha, *Löfgren* 460 (R, S). PARAÍBA: *de Moraes* 804 (US). PERNAMBUCO: Petrolandia, *Kuhlmann* s.n. (RB). Alagôa de Baixo, *Monteiro* 238 b (R). Caruarú (Carapotoz), *Pickel* 3511 (US). ALAGOAS: *Gardner* 1258 (S, US). BAHIA: Jacobina, *Schreiner* s.n. (R). Joazeiro, *Löfgren* 961 (RB). Joazeiro, Horto Florestal, *Zehntner* 148 (R). Frageiro, Rio S. Francisco, *Zehntner* 768 (M). Queimadas, *Rose & Russell* 19836 (US).

This species is related to *Melochia pyramidata* L. The fruit of the latter is not as hairy, and is frequently purple blotched. Also, the fruit of *M. tomentosa* has a longer rostrum and the lateral angle of the wings is acute or rounded, but is acute or acuminate in *M. pyramidata*. *Melochia tomentosa* is usually a taller and hairier plant than *M. pyramidata*. The leaves of *M. pyramidata* are usually subglabrous and usually have some simple hairs on the upper surface, those of *M. tomentosa* are usually tomentose and canescent and do not have simple hairs. The inflorescences of *M. pyramidata* are usually leaf-opposed, those of *M. tomentosa* are usually axillary.

The flowers open in the morning and close in the afternoon (Runyon), and are very fragrant (*M. arida* Rose) (Rose).

The varieties of *M. tomentosa* grade into one another.

49b. *Melochia tomentosa* L. var. *frutescens* (Jacq.) DC. Prodr. 1:490. 1824.

Melochia frutescens Jacq. Obs. Bot. 2:22, pl. 44. 1767.

Moluchia frutescens (Jacq.) Medic. Malv. 10. 1787.

The leaves of this variety are smaller than those of the typical variety. The petiole is less than 1 cm. long, and the lamina is typi-

cally 1–3 cm. long and less than 1 cm. to 2 cm. wide. The stem branches more than that of the typical variety.

TYPE LOCALITY: Saint Martin, West Indies.

Distribution: Mexico, West Indies, Venezuela, and Colombia.

MEXICO: LOWER CALIFORNIA: San Francisquito Bay, *Rose* 16733 (US); *Johnston* 3568 (US). Espiritu Santo Island, the Isthmus, *Johnston* 3962 (US). NAYARIT: TRES MARIAS ISLANDS: Maria Madre Island, *Mallby* 57 (US); *Solis* 12 (US). OAXACA: Puerto Angel, *Morton & Makrinius* 2641 in part (US). Teotitlán del Camino, *Seler* 809 (US).

BAHAMAS: ELEUTHERA: Rock Sound, *Krebs* s.n. (S). ?Siklins Island, *Eggers* s.n. (S). ANDROS: Mangrove Bay, *Brace* 4907 (US).

TURKS and CAICOS: *Proctor* 8780 (IJ), 9177 (IJ).

CUBA: *C. Wright* 40 (S, US). CAMAGÜEY: Pastelillo, Cayo Sabinal, *Ekman* 15413 (S), 15536 (S). ORIENTE: Santiago de Cuba W. of Playa Siboney, *Ekman* 7748 (S), 8730 (S). Guantánamo at Caimanera, *Ekman*, 2866 (S). Guantánamo Bay, *Britton* 1948 (US). Vicinity of El Cobre, *Pollard & W. Palmer* 384 (US). Berraco, vicinity of Daiquiri, *Britton & Cowell* 12672 (US); *Maxon* 4028 (US).

HAITI: Port de Paix, *Ekman* 3837 (S). Vicinity of St. Michel de l'Atalaye, *Leonard* 7327 (US), 7335 (S, US). Vicinity of Ennery, *Leonard* 10025 (US). Gonaïves and vicinity, *Leonard* 10067 (US). Vicinity of Cabaret, *E. C. & G. M. Leonard* 11874 (US), 11936 (US).

DOMINICAN REPUBLIC: Near Manuel de Ocoa, *Türckheim* 3690 (L, S, US). Monción, *Valeur* 158 (S, US). Gurabito, *Eggers* 1991 (US). MONTE CRISTI: Near Rio Yaque del Norte, *R. A. & E. S. Howard* 9608 (US), 9619 (US). BARAHONA: Trujín, *Abbott* 1726 (US). La Salina, *R. A. & E. S. Howard* 8364 (US). Beata Island, *Howard* 12498 (S, US); *Jiménez* 3772 (US).

JAMAICA: Kingston, *Orcutt* 4956 (S).

PUERTO RICO: *Stahl* 1027 (L, S). *Wylder* 26 (S). Cabo Rojo, Las Salinas, Otero M-33 (MICH); *Sintenis* 628 (L, S, US). Morrillos de Cabo Rojo, *Britton et al.* 4715 (US). Ponce and vicinity, *Underwood & Griggs* 698 (US); *Heller* 482 (US), 6064 (L, US). Coamo Springs, *Underwood & Griggs* 562 (US). Guanica, *Sintenis* 3499 (US). Brigadier Point to Puerto Negro, *Shafer* 2921 (US). ?La Paguera, *Sargent* 155 (US). ?Tajarto, *Sintenis* 1602 (US).

LESSER ANTILLES: U.S. VIRGIN ISLANDS: ST. CROIX: *Benker* s.n. (S). Salt pond, *Raunkiaer* s.n. (S). *Hansen* 109 (L). Frederiksted, *Rose et al.* 3525 (US), 3226 (US). ST. THOMAS: *Oersted* collected 1845–48 (MICH, S, US). *Schomburgk* 42 (W). *Eggers* 49 (US), 96 (MICH), 194 (S), 262 (L). *Wylder* s.n. (L). Water Island, *Britton et al.* 108 (US). ST. JOHN: *Breutel* s.n. (L). BRITISH VIRGIN ISLANDS: Tortola, *Fishlock* 43 (US). ST. MARTIN: *Suringar* May 1, 1885 (L). ST. BARTHÉLEMY: *Forsström* s.n. (S), *Euphrasén* s.n. (S), *von Goes* s.n. (S). St. Jean, *Stehlé* 911 (US). ST. EUSTATIUS: *Suringar* Apr. 8, 1885 (L). ST. KITTS: Canada Estate, *Britton & Cowell* 740 (US). ANTIGUA: Slopes and summit of Boggy Peak, Shekerley Mts., *A. C. Smith* 10421 (S, US). Near English Harbor, *Rose et al.* 3357 (US). Lyons, *Box* 997 dupl. (US). MONT-SERRAT: *Shafer* 418 (US). GUADELOUPE: *Duss* 480 (US), 2901 (US). GRENA-DINES: West coast of Mustique, *A. C. Smith* 10163 (S, US).

CURAÇAO: *Killip & Smith* 21056 (US). *Curran & Haman* 26 (US).

TRINIDAD: Patos Island, *Britton et al.* 526 (US).

VENEZUELA: Northern Venezuela, *Curran & Haman* 876 (US). NUEVA ESPARTA: Robledar, *Gines* 3191 (US), 3871 (US). El Valle, *Gines* 4126 (US). R. Matasiete, *Gines* 2759 (US), 3195 (US). Salamanca, *Gines* 3647 (US). Cer-

rado, *Gines* 3768 (US). SUCRE: Valley of Bordonos SW. of Cumaná, *Steyermark* 62891 (US). LARA: Barquisimeto, *Tamayo* 2616 (US). Carora, *Jahn* 184 (US). TRUJILLO: La Concepcion, *Reed* 1011 (US). MERIDA: El Molino, just above Lagunillas, *Steyermark* 56222 (US). BOLIVAR: Along Río Caroní, near Puerto Ordaz, *Steyermark* 94224 (US).

COLOMBIA: MAGDALENA: Near Codazzi, about 90 km. NE. of Chiriguana, *Haught* 2306 (MICH, US), 3734 (US).

49c. *Melochia tomentosa* L. var. *turpiniana* (H.B.K.) Schum. in Mart. Fl. Bras. 12(3):34. 1886.

Melochia Turpiniana H.B.K. Nov. Gen. & Sp. 5:323, pl. 482. 1823.

The leaves of this variety are about the size of those of the typical variety, but differ in that the upper surface is green rather than canescent and the serrations are broader and fewer.

TYPE LOCALITY: ?Colombia. The type was collected by Humboldt and Bonpland who were not certain of the locality.

DISTRIBUTION: Mexico, West Indies, Venezuela, and Colombia.

MEXICO: Mexico und Umgebung, *Wawra* 394 (W). JALISCO: Tequila, *Herréron* Nov. 1902 (S). Corcovado Canyon, NE. of Autlán, toward Guadalajara, *R. L. & C. R. Wilbur* 2378 (MICH, US). MICHOACÁN: Zitacuaro-Tuzantla, *Hinton* 13064 (US). Between San Juan de los Plátanos and Amatlán, *McVaugh*, 17956 (MICH, US). COLIMA: Manzanillo and vicinity, *Ferris* 6150 (US). OAXACA: Tomellin Canyon, *Pringle* 4631 (MICH, S, US). About 4-5 km. E. of Juchitán, *King* 1631 (US). YUCATÁN: *Gaumer* 487 (MICH, S, US). QUINTANA ROO: Cozumel Island, *Gaumer* 88 (K).

HAITI: Port-au-Prince and vicinity, *Ekman* H. 9342 (S, US); *Rose* 22096 (GH, US); *Holdridge* 1005 (MICH, US).

DOMINICAN REPUBLIC: Santo Domingo, Valle del Cibao, *Ekman* H. 15983 (S).

JAMAICA: *Swartz* s.n. (S). *D. D. Wright* s.n. (S).

LESSER ANTILLES: MARTINIQUE: Near Casa Pilote, *Hahn* 240 (S). GRENADINES: Bequia, *Eggers* 7058 (US). Cannovan I., *Beard* 1409 (S, US).

VENEZUELA: ANZOÁTEGUI: Puerto La Cruz, Guaraguao, *Pittier* 14909 (US). CARABOBO: Puerto Cabello, *Linden* 1549 (W). LARA: Near Barquisimeto, *Saer* 233 (US).

COLOMBIA: *Wagner* 32 (US). ?COLOMBIA: *Humboldt & Bonpland*, F neg. 35386 ex P of type of *Melochia Turpiniana* H.B.K. (US). MAGDALENA: Around Rio Frío, between the Ciénaga de Santa Maria and the foothills, *Pittier* 1601 (US). Santa Marta, *H. H. Smith* 474 (L, S, US). ATLÁNTICO: Barranquilla and vicinity, *Bro. Elias* 186a (US); *Torregroza et al.* 18 At 505 (US); *Dugand* 3254 (US); *Bro. Paul* C-2 (US). Near Puerto Colombia, *Kalláh et al.* 19 At 033 (US); *Bro. Elias* 24 (US), 824 (US). BOLÍVAR: Cartagena and vicinity, *Billberg* 33 (S); *Engstedt* 45 (S); *Dahlin* s.n. (S); *Killip & Smith* 14017 (US), 10462 (US).

49d. *Melochia tomentosa* L. var. *speciosa* (S. Wats.) A. Goldberg, comb. et stat. nov.

Melochia speciosa S. Wats. Proc. Amer. Acad. 24:42. 1889.

Melochia pterocarpa J. Ar. in Mém. Inst. Sci. Madag., ser. B, 7:68. 1956.

The leaves of this variety are small and differ from those of the other varieties in being green on both surfaces and hispidulous rather

than tomentulose. The plant is very slender, has inflorescences at few nodes, and the flowers are larger than average for the species.

The zygomorphy of the corolla and androecium reported by Arènes for his *M. pterocarpa* may have been due to differential shrinkage in drying or to an anomalous condition. I dissected flowers from the type specimen and found petal sizes intermediate between the extremes reported by Arènes. The range in length of petals from one corolla was 13.3–14.4 mm. The calyx teeth of *M. tomentosa* may vary slightly in size in a single calyx.

TYPE LOCALITY: The type was collected by *E. Palmer*, no. 650, at Guaymas, Sonora, Mexico, and is cited below.

DISTRIBUTION: Endemic to Western Mexico, adventive in Madagascar.

MEXICO: SONORA: Guaymas, *E. Palmer* 148 in 1887 (MICH, US), 266 in 1897 (S, US), 650 in 1887 (US, type of *Melochia speciosa* S. Wats.). Three mi. W. of Jori, *Pennell* 19458 (US). **SINALOA:** Vicinity of Culiacan, *Brandege* s.n. (US). Vicinity of Topolobampo, *E. Palmer* 205 in 1897 (MICH, US); *Rose et al.* 13275 (US). Cerros del Fuerte, 18–24 mi. N. of Loc Mochis, *Gentry* 14288 (US). **ZACATECAS:** San Juan Capistrano, *Rose* 3551 (US). **JALISCO:** Near Huejuquilla, *Rose* 3558 (US). **MICHOACÁN:** Zitacuaro-Tuzantla, *Hinton* 13064 (MICH, US).

MADAGASCAR: *Scott Elliot* 650 (P), type of *M. pterocarpa* J. Ar.

50. *Melochia crenata* Vahl, Symb. 3:86, pl. 68. 1794.

Riedleia crenata (Vahl) DC. Prodr. 1:491. 1824.

Visenia crenata (Vahl) Spreng. Syst. 3:30. 1826.

Melochia diffusa Bert. ex Spreng. Syst. 3:30. 1826.

A sparingly branched prostrate subshrub or herb with shoots to 1 meter long, the young stems and petioles densely tomentose, somewhat canescent, hairs stellate, 0.3–1.3 mm. long, internodes 2.3–8.3 cm. long; stipules 2.5–3.7 mm. long, 0.8–2.0 mm. wide, ovate to lanceolate, acute, mostly ciliate, hairs simple, 0.3–1.0 mm. long, shorter stellate hairs 0.3–0.5 mm. long on the abaxial surface; petiole 0.7–2.0 cm. long.

Lamina 1.4–3.5 cm. long, 1.1–2.6 cm. wide, oval to broadly ovate, the base rounded, rarely slightly cuneate, the apex rounded, one side sometimes slightly larger than the other, both surfaces densely tomentose, somewhat canescent, velvety to the touch, hairs stellate, 0.1–0.4 mm. long, the margin irregularly crenate-serrate, serrations 1.3–3.5 mm. wide, 0.5–1.1 mm. high, 6–7 pairs of primary veins, 2 basal.

Inflorescences 2.0–3.7 cm. long, 90° from the leaf to leaf-opposed, at 2–9 nodes, the peduncle 0.7–2.1 cm. long, 1 or 2 at a node, terminated by a 2–5-flowered umbel, the pedicel 4.0–7.0 mm. long; bracts 1.0–4.5 mm. long, 0.4–0.8 mm. wide, lanceolate or deltoid- to ovate-acute, mostly ciliate, hairs simple, forked, and stellate, 0.3–1.0 mm. long.

Calyx 5.2–6.2 mm. long, 4.2–5.2 mm. wide, densely tomentose, hairs stellate, 0.3–1.0 mm. long, the teeth 3.0–3.6 mm. long, 1.5–1.9

mm. wide, deltoid-acute to deltoid-acuminate, the sinus acute; petals purple, magenta to rather pale red, 11.2–15.5 mm. long, 3.6–5.2 mm. wide, obovate-cuneate, sometimes with scattered, mostly ciliate, glandular hairs 0.05 mm. long, attached to the stamens for 2.5–3.3 mm., the claw 1 mm. long.

Longistylous form. According to Fawcett & Rendle (13), stamens 7–8 mm. long, the filaments free for 2.5–3.0 mm.; pistil about 11 mm. long, the styles united shortly (1.5–2 mm.) at the base, the ovary and styles somewhat hirsute with branched hairs.

Brevistylous form. Stamens 10.4–11.3 mm. long, the filaments flattened, 0.3 mm. broad, free for 5.5–6.5 mm., with scattered glandular hairs 0.05 mm. long, the anther 1.3–2.0 mm. long, 0.6–0.8 mm. wide, oblong, slightly emarginate at both ends; pistil 4.5–6.9 mm. long, the styles free for 2.1–3.0 mm., united for 0.5–1.0 mm., filiform, papillose for 0.7–0.8 mm., the ovary narrowly ovoid, the united part of styles and ovary hirsute-tomentose, hairs 0.5 mm. long.

Fruit 10.0–10.5 mm. long, of which the rostrum is 1.5–2.0 mm. long, 6.7–8.7 mm. wide, pentapterous-ovate, narrowed at the base to a stripe 0.5–1.0 mm. long, the outer angles of wings rounded, hardly evident, below the middle of the capsule, the sulci between the carpels extending a third to half way to the center of the fruit, densely tomentose, hairs stellate, 0.2–0.5 mm. long; dehiscence loculicidal along the dorsal suture; seeds not quite ripe, 2.9–3.0 mm. long, 1.7–2.0 mm. wide, brown, usually 2 per cell.

Flowering specimens collected in July, September, and October; fruiting ones, in July and October.

TYPE LOCALITY: Near Santa Marta, Colombia. Type collected by von Rohr.

DISTRIBUTION: Colombia and Jamaica in sandy soil near sea level.

?JAMAICA: ?*W. Wright* (W).

COLOMBIA: GOAJIRA: *Dawe* 532 (US). MAGDALENA: Santa Marta, *H. H. Smith* 473 (K, P, S, US), 475 (A). F neg. 21602 of type ex C (US). ?Santa Marta, *Balbis* (S). Riohacha, *Haught* 4409 (US).

The species can be distinguished from other members of the section by its fruits, which are not pyramidal and have rounded rather than acute or acuminate wings. Its trailing habit, leaves rounded at the apex, and long pedicels are also aids in identification. It is perhaps most closely related to *M. tomentosa* L.

The collection of the specimen photographed as F 21602 ex C is attributed to Ryan, but the type was collected by von Rohr.

This species is cited as occurring in Peru by Macbride (39). To my knowledge, it does not occur there.

51. *Melochia pyramidata* L. Sp. Pl. 674. 1753.

A slender erect or spreading annual or perennial herb to shrub, 0.08–2.0 meters high, usually branched, sometimes several branches from the base of the stem, the root sometimes thickened and 0.5–1.3 cm. wide, the young stems hirsute-tomentulose, hairs in a longitudinal line or surrounding the stem, simple, sometimes also stellate and forked, 0.2–0.5 mm. long, internodes (0.2–) 2–10 cm. long; stipules 1.5–5.3 mm. long, 0.2–1.0 mm. wide, deltoid-acuminate or lanceolate, rarely linear, hirsute-tomentulose and ciliate, hairs simple, forked, and stellate, 0.2–0.8 mm. long; petiole (0.1–) 0.4–2.0 (–4.7) cm. long, hirsute-tomentulose on the upper surface or all the way around.

Lamina (0.7–) 2–6 (–10.5) cm. long, (0.3–) 0.6–3.0 (–7.7) cm. wide, the upper leaves tending to be lanceolate, the lower ovate, rarely oblong, the base rounded, sometimes cordate or attenuate, the apex acute, acuminate or rounded, the basal leaves usually smaller, sometimes nearly orbicular, the upper surface green, subglabrous or hirsute, hairs simple, appressed, sometimes also forked and stellate, 0.1–1.0 mm. long, the lower surface green, with few hairs on the veins, sometimes slightly yellowish-canescens, or tomentulose, hairs stellate, sometimes also forked, simple, and glandular, 0.1–0.4 (–0.7) mm. long, the margin irregularly crenate-serrate, serrations 0.8–4.4 mm. wide, 0.2–2.0 mm. high, 5–11 pairs of primary veins, 1 or 2 (–3) are basal.

Inflorescences generally leaf-opposed, sometimes 90° from the leaf, rarely also axillary or terminal, 1.3–5.2 cm. long, at (1–) 3–8 upper nodes, umbellate, (1–) 3–8 (–15) flowers per umbel, the peduncle slender, (0–) 0.2–1.6 (–3.3) cm. long, 0.4 mm. wide, rarely branched, the pedicel 1–5 (–6) mm. long; bracts 0.5–3.0 mm. long, 0.2–0.7 mm. wide, deltoid-acuminate, lanceolate or linear, ciliate and hirsute-tomentulose, hairs simple, forked, and stellate, 0.1–0.5 mm. long.

Calyx 3.7–6.2 mm. long, 2.1–4.0 mm. wide, ciliate and hirsute-tomentulose, hairs stellate, and forked, 0.1–0.5 mm. long, the teeth 2–4.9 mm. long, 0.6–1.5 mm. wide, usually deltoid-acuminate, sometimes deltoid-acute, the sinus acute to narrowly rounded; petals usually purple, pink, violet, blue, sometimes yellow proximally, rarely red, white or yellow, (3–) 7–11.5 mm. long, (1.5–) 2.4–3.0 mm. wide, obovate-ob lanceolate-spatulate, attached to the staminal tube for 1–3 mm., the claw 0.6–2.5 mm. long, sometimes glandular hairs 0.05 mm. long on the petals.

Longistylous form. Stamens (2.6–) 3.5–6.3 mm. long, the filaments free for 0.7–2.0 mm., the anther 0.7–1.2 mm. long, 0.4–0.6 mm. wide, oblong, emarginate at both ends; pistil 4.3–9.0 mm. long, the styles free for 2–4.8 mm., united for 0.5–2.1 mm., filiform, papillose for 0.6–1.0 mm. at the apex, the ovary ellipsoid, the styles and ovary

hirsute-tomentulose, hairs stellate, 0.1–0.4 mm. long, the stipe 0–0.2 mm. long.

Brevistylous form. Stamens 5.7–7.5 mm. long, the filaments free for 3–4 mm., the anther 1–1.2 mm. long, 0.5–0.6 mm. wide, shape same as that above; pistil 3.7–5.0 mm. long, the styles free for 1.4–2.0 mm., the ovary ellipsoid to oblong-ellipsoid, subglabrous to hirsute-tomentulose, hairs 0.1–0.2 mm. long.

Fruit often with purple blotches, 5–9.5 mm. long, (5–) 6.5–14 mm. wide, the rostrum short, 0–2.1 mm. long, the base narrowed into a stipe 0.2–1.0 mm. long, occasionally 6 or 7 carpels present, pyramidal, pentapterous, the points of wings acute or acuminate, at the middle or toward the base of the fruit, the sulci between the carpels extending half way to the center of the fruit, the base stipitate for 0.2–1.0 mm., subglabrous, hirsute or tomentulose, hairs only stellate or also simple and forked, 0.1–0.5 mm. long; dehiscence loculicidal all along the dorsal and ventral sutures; seeds 1.7–2.6 mm. long, 1.1–1.7 mm. wide, trigonal, brown, 1 or 2 per cell.

Flowering and fruiting specimens collected throughout the year in the West Indies and for 8 months in the colder regions near the extremes of the range.

Key to Varieties of *M. pyramidata*

1. Lamina subglabrous, hairs on upper surface often simple. **51a. *M. pyramidata* var. *pyramidata***
 1. Lamina usually tomentulose beneath, hairs on upper surface more commonly stellate **51b. *M. pyramidata* var. *hieronymi***

51a. *Melochia pyramidata* L. var. *pyramidata*

- Melochia domingensis* Jacq. Select. Stirp. Amer. 194. 1763.
Moluchia fruticosa Medic. Malv. 10. 1787.
Moluchia herbacea Medic. Malv. 10. 1787.
Moluchia domingensis (Medic.) Steud. Nom. II, 2:155. 1841.
Sida Sabeana Buckley, Proc. Acad. Phila. for 1861, 449. 1862.
 ?*Melochia pyramidata* L. var. *normalis* O. Ktze. Rev. Gen. Pl. 3(2):25. 1898.
Moluchia pyramidata (L.) Britt. Brooklyn Bot. Gard. Mem. 1:69. 1918.

The leaves of the typical variety are subglabrous.

TYPE LOCALITY: Brazil. The type is in the Linnaean herbarium.

DISTRIBUTION: Southern and western Texas to Costa Rica, West Indies, northern South America to northern Argentina, adventive in tropical and subtropical areas in various parts of the world, usually in open disturbed places, often along the roadside, margin of cultivated fields, and in waste places, in various types of wet or dry soil, at 0–1,560 meters elevation, usually below 1,000.

UNITED STATES: TEXAS: Guadalupe River, *Lindheimer* 356 (US, W). Western Texas to El Paso, *C. Wright* 1334 (US). Mexican Boundary Survey, *Parry et al.* s.n. (US). COMAL: Comanche Spring, New Braunfels, *Lindheimer* 687

(US, W). Bracken, *Groth* 110 (US). BEXAR: 25 mi. N. of San Antonio, *Schulz* 554 (US). COLORADO: Eagle Lake, *E. J. Palmer* 6601 (US); *Barkley et al.* 46449 (S, W). GALVESTON: San Leon, *Fisher* 5083 (US). UVALDE: Uvalde, *E. J. Palmer* 12295 (US). KINNEY: Near Rio Grande River, *Correll* 14901 (US). BRAZORIA: Brazos River, *Bush* 271 (US). Columbia, *Bush* 1346 (US). MATAGORDA: Bay City, *Fisher* 180 (US). *E. J. Palmer* 9625 (S, US). Near Colorado River W. of Bay City *Rogers* 6599 (W). Palacios, gulf coast, *Tharp* 178 (MICH). MAVERICK: Eagle Pass, *Havard* s.n. (US). CALHOUN: Guadalupe River bottoms, 15 mi. SW. of Port Lavaca, *Cory* 51145 (US). KLEBERG: Kingsville, *Bogusch* S-130 (US). WEBB: Laredo, *J. N. & J. S. Rose* 11019 (US). Laredo, Rio Grande River, *E. Palmer* 117 in 1879-80 (MICH, US). HIDALGO: Mission, *Shiller* 843 (US). Tabasco, *Clover* 218 (MICH). Six mi. S. of Alamo, *Clover* 879 (MICH). Rio Grande Valley, *M. L. Walker* 41 (S, W). WILLACY: E. of San Perlita, *C. L. & A. A. Lundell* 8782 (MICH). CAMERON: Brownsville, *Hanson* 300 (US); *Rose & Russell* 24245 (US); *Runyon* 554 (US); *Tharp* 1179 (US). Las Palmas Plantation, about 4 mi. SW. of Brownsville, *Correll* 14862 (US). Arroyo Colorado, Olmito road, *Clover* 1261 (MICH).

MEXICO: *Sartorius* s.n. (US). Mirador, *Sartorius* s.n. (US). SONORA: Vicinity of Alamos, *Rose et al.* 12912 (US); *Gentry* 4770 (MICH, US). On road to Guaymas 16 mi. S. of Hermosillo, *Wiggins & Rollins* 205 (MICH). COAHUILA: Sabinas, *Nelson* 6816 (US). About 23 mi. S. of Sabinas, *Shreve* 8418 (MICH, US). Palm Canyon, *Marsh Jr.* 972 (GH). Muzquiz, Santa Anna Canyon, *Marsh Jr.* 444 (GH). Monclova, *White* 1726 (MICH). NUEVO LEON: Rio Santa Catarina, Monterrey, *Bro. Arsène* 6304 (US). About 28 mi. S. of Nuevo Laredo on road to Monterrey, *T. C. & E. M. Frye* 2340 (US). Valley, Monterrey, *Pringle* 1939 (MICH, S, US, W). Forty mi. S. of Laredo, *Schery* 7 (MICH). Mts. near Monterrey, Diente Canyon, *C. H. & M. T. Mueller* 303 (W). TAM-AULIPAS: San Lucas, *Viereck* 737 (US), 876 (US). Victoria and vicinity, *E. Palmer* 68 in 1907 (US); *Fisher* 3355 (US). Vicinity of El Mulato near Tanque, *Bartlett* 10996 (MICH, US), 10994 (MICH). Vicinity of Marmolejo, *Bartlett* 10945 (MICH). Buena Vista Hda., *Wootton* s.n. (US). Ten mi. E. of Ciudad Mante, *Kenoyer & Crum* 3665 (MICH). Huisachal, *Stanford et al.* June 29, 1949 (US). SINALOA: Mazatlan and vicinity, *Rose et al.* 13676 (US); *Lamb* 354 (US); *Brandegge*, Oct. 8, 1893 (UC). Culiacan, *Rose et al.* 14856 (US); *Brandegge*, Sept. 19, 1904 (UC). Vicinity of Villa Union, *Rose et al.* 13929 (US). Vicinity of Topolobampo, *Rose et al.* 13274 (US). Imala, *Gentry* 4944 (MICH). SAN LUIS POTOSÍ: Tamasopo, *Fisher* 3735 (US). Tancanhuitz, *Nelson* 4394 (US). NAYARIT: Vicinity of Acaponeta, Tepic, *Rose* 3114 (US); *Rose et al.* 14221 (US). JALISCO: Near Chapala, *Rose & Painter* 7671 (US). Tequila, *E. Palmer* 371 in 1886 (MICH, US). Corcovado Canyon, 11 mi. NE. of Autlán, *R. L. & C. R. Wilbur* 2376 (MICH, US). Five mi. E. of Autlán, *R. L. & C. R. Wilbur* 2234 (MICH, US). QUERÉTARO: *Bro. Aguiel* 10446 (US). HIDALGO: Huejutla, *C. & E. Seler* 620 (US). VERA CRUZ: Mirador, *Wawra* 968 (W). Soledad, *Wawra* 544 (W). Barranca de Zacuapan, *Purpus* 2057 (US). SAN ANDRÉS TUXTLA: Between Los Mangos and San Juan de Azúcar, *Dressler & Jones* 206 (US). MORELOS: Yautepec, *Rose et al.* 5345 (US), 6560 (US). Cuantla and vicinity, *Pringle* 9405 (US); *Lyonnet* 673 in part (US). Xochiltepec, *Lyonnet* 2159 (US). MEXICO: *Wawra* 393 (W). TEMASCALTEPEC: Rincón del Carmen, *Hinton* 1742 (US). Tenayac, *Hinton* 4018 (US). MICHOACÁN: One mi. W. of Coahuayana, 20 mi. SE. of Tecoman, *Turner* 1973 (MICH). South shore of Lake Chapala, *Schery* 173 (MICH). ZITACUARO: Zitacuaro-Tuzantla, *Hinton* 13073 (MICH, US). HUETAMO: Tacupa, *Hinton* 5622 (US). COLIMA: Colima, *E. Palmer* 165 in 1897 (MICH, S, US). Manzanillo, *E. Palmer* 912 in 1890

(MICH, US). REVILLAGIGEDO ISLANDS: Clarion Island, *Howell* 8372 (US); *Mason* 1560 (MICH, US); *Anthony* 408 (US). Socorro Island, *Barkelw* 247 (US). GUERRERO: Agua de Correa, *Langlassé* 403 (US). Acapulco and vicinity, *E. Palmer* 193 in 1894-95 (US). Cañon de la Mano Negra, near Iguala, *Rose et al.* 9329 (US). OAXACA: Oaxaca and vicinity, *Conzatti* 1601 (US); *Rose & Hough* 4646 (US). Between Mitla and Oaxaca, *J. N. & N. S. Rose* 11285 (US). Half a km. E. of and 4 km. NNE. of Tehuantepec, *King* 320 (MICH). Puerto Angel, *Morton & Makrinius* 2641 in part (US). TUXTEPEC: Chiltepec and vicinity, *Martinez-Calderon* 265 (US). TABASCO: Reforma, Belancan, *Matuda* 3189 (MICH). CAMPECHE: Tuxpeña, *Lundell* 966 (MICH, US). YUCATÁN: San Anselmo, *Gaumer* 2208 (MICH, S, US, W). Uxmal, *Steere* 2016 (MICH). Chichen Itzá, *Steere* 1394 (MICH). Yot Tzonot, *Gaumer* 1332 (MICH).

GUATEMALA: Agua Blanca, *Tejada* 104 (US). HUEHUETENANGO: Chorulá, *C. & E. Seler* 2867 (US). ALTA VERAPAZ: Chamiquin, *von Türckheim* 560 (US, W). IZABAL: Quiriguá, *Standley* 23796 (US). ZACAPA: Gualan, *Kellerman* 5617 (US). SANTA ROSA: La Vega, *Heyde & Lux* 6079 (US).

BRITISH HONDURAS: Lower Belize River, *Record* s.n. (US). Corozal District, *Gentle* 313 (MICH), 282 (MICH), 344 (MICH). Corozal, *Lundell* 4797 (MICH). Santa Rita, *Gentle* 579 (MICH).

HONDURAS: Mosquito coast, *Wullschlägel* 56 (W). Guaymas, *Standley* 55454 (US). GRACIAS: *Hjalmasson* s.n. (S). SANTA BÁRBARA: San Pedro Sula, *Thieme* 5154 (US). MORAZÁN: Zamorano, *Molina R* 371 (US).

SALVADOR: *Renson* 12 (US). Finca San Nicolas, *Choussy* 88 (US). AHUACHAPÁN: *Padilla* 410 (US). Vicinity of Ahuachapán, *Standley* 19946 (US). SANTA ANA: *Calderón* 395 (US). SONSONATE: Santa Emilia, *Standley* 22065 (US). Armenia, *Standley* 23436 (US). LA LIBERTAD: Vicinity of Ateos, *Standley* 23380 (US). SAN SALVADOR: *Calderón* 19 (US). *Velasco* 8923 (US). Vicinity of San Salvador, *Standley* 19417 (US), 20571 (S, US). San Martin and vicinity, *Calderón* 436 (US); *Standley* 22537 (US). SAN MIGUEL: Laguna de Olomega, *Standley* 20999 (US). Hacienda Potrero Santo, S. side of Lake Olomega, *Tucker* 849 (US).

NICARAGUA: CHINANDEGA: *Baker* 581 (US). CHONTALES: *Friedrichsthal* 711 (W).

COSTA RICA: Nicoya, *Cook & Doyle* 664 (US).

BAHAMAS: NEW PROVIDENCE: *Britton & Brace* 594 (US). Near Nassau, *Curtiss* 21 (L, US). Lake Killarney, *E. G. Britton* 3285 (US).

CUBA: *Jamain* s.n. collected 1863 (W). *de la Sagra* 111 (W). *C. Wright* 3509 (US). PINAR DEL RÍO: Near Guanajay, *W. Palmer & Riley* 668 (US). HABANA: *Baker & Wilson* 363 (US). Vedado, *Ekman* 21 (S). MATANZAS: Yumury Valley, *Rugel* 41 (L). LAS VILLAS: Vicinity of Soledad, *Howard* 5013 (MICH, US); *Morton* 4261 (US). District Cienfuegos, *Combs* 273 (US). Limones, Soledad, Cienfuegos, *Jack* 6250 (S). Banao Mts., *Bro. León* 21940 (US). ORIENTE: Santiago de Cuba and vicinity, *E. Palmer* 375 in 1902 (US), *Ekman* 8037 (S). Vicinity of San Luis, *Pollard & W. Palmer* 331 (US). Bayate, Central Miranda, *Ekman* 5681 (S), 9662 (S). Central highway, Santa Rita, Jiguaní, *Bro. Clemente* 6073 (US).

HAITI: Vicinity of Port-au-Prince, *Leonard* 2854 (US). Vicinity of St. Marc, *Leonard* 2962 (US), 2966 (US). Vicinity of Fond Parisien, Etang Saumatre, *Leonard* 4188 (US). Vicinity of Jean Rabel, *E. C. & G. M. Leonard* 13041 (US). Miragoane, *Eyerdam* 22 (US), 170a (US), 489 (US). Massif des Matheux, Mirebalais, *Ekman* H2291 (S, US). Massif de la Selle, Petionville, *Ekman* H8113 (S, US). DU NORD: Vicinity of St. Michel de l'Atalaye, *Leonard* 7310 (US), 7352 (US). DE L'ARTIBONITE: Vicinity of Ennery, *Leonard* 8910 (US).

TORTUE ISLAND: Basse Terre, *E. C. & G. M. Leonard* 12510 (US). La Vallée, *E. C. & G. M. Leonard* 15358 (US), 15520 (US). Palmiste, *Ekman* H5123 (S).
GONAVE ISLAND: Vicinity of Pikmi, *Leonard* 5130 (US).

DOMINICAN REPUBLIC: Santo Domingo, *Ritter* Jan. 1823 (W); *C. Wright et al.* 132 (US); *von Türckheim* 2502 (L, S, US); *Ekman* H12505 (S, US); *Allard* 13109 (US), 13375 (S, US), 13682 (US), 14028 (US). Santo Domingo, Azua, *Rose et al.* 4418 (US), 4003 (US). Near Constanza, *von Türckheim* 3251 (L, S, US, W). Puerto Plata, *Raunkiaer* 1103 (US), 1191 (US). Haina, *Faris* 21 (US), 30 (US), 80 (US), 156 (US). SANTIAGO: Santiago, *Raunkiaer* 903 (US). Novarrete, *Abbott* 1106 (US), 1109 (US). La Delgada, *Jiménez* 1002 (US). BARAHONA: Near Barahona, *Fuertes* 66 (L, S, US, W). SAN JUAN: Juan Santiago, *R. A. & E. S. Howard* 9222 (S, US). MONTE CRISTE: Moncion *Valeur* 183 (MICH, S, US), 849 (US).

JAMAICA: *Swartz* s.n. (S). *Cuming* 99 (W). ST. ELIZABETH: Pepper, *Harris* 9861 (US). LOWER CLARENDON: Inverness, *Harris* 12751 (US).

PUERTO RICO: *Wylder* 305 (L). Toa Alta, *Stahl* 603 b (L). Road from Guayama to Aguirre, *Underwood & Griggs* 388 (US), 412 in part (US). Aguirre, *Goll* 549 (US). Road from Coamo to Ponce, *Underwood & Griggs* 579 (MICH, US). Between Coamo and Aybonito, *Sintenis* 1971 (US). Coamo Springs, *Goll* 729 (US); *Heller* 6108 (L, US). Guaraguao, Ponce, *Goll* 818 (US). Magueyes, Ponce, *Goll* 777 (US). Along Rio Portuguese, Ponce, *Underwood & Griggs* 726 (US). Guanica, *Sargent* 30 (US); *Smyth* 5013 (US). Cabo-Rojo, *Sintenis* 801 (L, S, US). Between Peñuelas and Tallaboa, *Sintenis* 4817 (L). VIEQUES ISLAND: Santa Maria to Caballo Colorado, *Shafer* 2692 (US).

LESSER ANTILLES: U.S. VIRGIN ISLANDS: ST. CROIX: *West* s.n. (L). Bassin, *Ricksecker* 98 (US). Frederiksted, *Rose et al.* 3201 (US). Grange, *Oersted* s.n. (S); *Hansen* s.n. (S). Anna's Hope, *Thompson* 878 (S). BRITISH VIRGIN ISLANDS: TORTOLA: Bank, Sea Cow Bay, *Britton & Shafer* 925 (US). Experiment Station, *Fishlock* 12 (US), 163 (US). ST. BARTHÉLEMY: *von Goës* s.n. (S). *Forsström* s.n. (S). ST. EUSTATIUS: *Suringar* May 1885 (L). ST. KITTS: Near Sandy Point, *Britton & Cowell* 149 (US). ANTIGUA: Near Bellevue, *Boz* 932 dupl. (US). St. John's, *Ramsammy* 110 (US). MONTserrat: Plymouth, *Shafer* 1 (US); *Potter* 5553 (GH). GUADELOUPE: *Duss* 2671 (US). Pointe-à-Pitre, *Hammarlund* 32 (S). Jarry, *Questel* 598 (US). Gosier, *Questel* 2472 (US). MARIE GALANTE: *Questel* 1456 (US). DOMINICA: Wallhoure, *Eggers* 652 (L). ?ST. LUCIA: ?Grande Anse, *Eggers* 6460 (US). GRENADA: *Eggers* 6460 (US). St. George, *Broadway* s.n. (US). Victoria, *Suringar* s.n. (L).

VENEZUELA: Las Adjuntas and Rio Macarao, *Eggers* 13277 (L, US; these specimens lead toward *M. pyramidata* var. *hieronymi*). MIRANDA: Around Dos Caminos and Los Chorros, *Pittier* 5923 (US). FEDERAL DISTRICT: Caracas, San Bernardino, *Fernández* 194 (US). Lower Catuche wood above Caracas, *Pittier* 7026 (US). ARAGUA: Maracay, *Vogl* 336 (S).

COLOMBIA: Plages de la Magdalena, *Goudot*, collected 1844 (P). MAGDALENA: Santa Marta, *H. H. Smith* 472 (L, S, US). ATLÁNTICO: Barranquilla and vicinity, *Bro. Elias* 1343 (US, W). Usiacurí, Arroyo Cagón, *Dugand & Garcia Barriga* 2346 (US). Between Palmar de Varela and Pondera, *Dugand* 4509 (US). Puerto Colombia, *Pennell* 12025 (US); *Dugand* 5473 (US). BOLÍVAR: Cartagena and vicinity, *Billberg* 34 (S); *Killip & Smith* 14159 (US). Sincelejo, *Pennell* 4073 (US). Turbaco, *Bro. Heriberto* 494 (US). ?TOLIMA: Tocaima, *Arbelaez* 2092 (US). HUILA: Río Cabrera ca. 18 km. NE. of Villavieja, *S. G. Smith* 1197 (US). ANTIOQUIA: Occidente, *Peláez et al.* 581 (US). VALLE DEL CAUCA: Cuchilla, E. of Zarzal, *Pennell et al.* 8529 (US). Zaragoza, *Cuatrecasas* 22782 (US). CAUCA: Cali and vicinity, *Pittier* 619 (US). Cerrito in Cauca Valley, *Lehmann* 3866 (US).

ECUADOR: GUAYAS: Guayaquil and vicinity, *Asplund* 5113 (R, US); *Fagerlind & Wibom* 105 (S); *Mille* s.n. (MICH); *Haenke* s.n. (W). Oil camp between Guayaquil and Salinas, *Hitchcock* 19983 (US). Vicinity of Durán, *J. N. & G. Rose* 23615 (US).

PERU: SAN MARTÍN: Pucayacu 11 km. from Tarapoto, *Ferreyra* 7752 (US). LORETO: Maucallaeta, Río Paranapura, *Klug* 3927 (S, US).

BOLIVIA: SANTA CRUZ: Cabezas, *Peredo* 443 (UC). Cabezas Laguna del Turco, *Peredo* 146 (S).

BRAZIL: *Sellow* s.n. (US). MARANHÃO: Island of São Luiz, *Fröes* 11887 (US), 24080 (US). CEARÁ: *Allemão & Cysneiros* 133 (R, US). Fortaleza to Crato, *Duarte* 1383 (US). FORTALEZA: Floresta, *Drouet* 2324 (MICH, S, US). Maracanaú, *Fernandez* 30 (R); *Ducke* 2606 (US). Ipú, *Löfgren* 213 (S). Cedro, *Löfgren* 74 (S). PARAÍBA: *Xavier* s.n. (R). Arcia, *Vasconcellos* 271 (US). PERNAMBUCO: Olinda, *Bento* 40 (RB). São João dos Pombos, *Falcão et al.* 1015 (US). Tome, Recife, *Monteiro* 210 (R). BAHIA: Serra Jacobina, *Blanchet* 2677 (W). Sento Sé, *Campos Porto* 2470 (RB). MINAS GERAIS: *Glaziou* 13553 (P). Arassuahy near Rio Manso, *Glaziou* 13557 in part (R). ITUIUTABA: Funda, *Macedo* 2449 (US). GOIÁS: *Gardner* 3605 (W). Between Corallinho and Cazada Telha, *Pohl* 2801 (W). About 13-15 km. E. of Formosa, *Dawson* 15098 (US). DISTRITO FEDERAL: *Occhioni* 425 (US). MATO GROSSO: Corumbá, *Hoehne* 2983 (R), 3385 (R). Aquidauana, *Reiss* s.n. (GH). GUANABARA: Mundo Novo, Botafogo, *Kuhlmann* 74151 (RB). Corcovado, *Diomsio* (RB). Margin of Lake Rodrigo de Freitas, *Guerra* s.n. (US). RIO DE JANEIRO: Araruama near Cabo Frio, *Glaziou* 10326 (R). SÃO PAULO: *Sellow* 5288 in part (R). PARANÁ: S. Jeronimo da Serra, *Hatschbach* 3726 (US). Provedência Cruzeiro do Oeste, Serra Dourada, Rio Iraí, *Braga & Lange* 60 (US). RIO GRANDE DO SUL: S. Borja, *Rambo* (PACA 3048). Fazenda do Jarau near Quaraí, *Rambo* (PACA 27197).

URUGUAY: Fray Bentos, *Fruchard* Feb. 11, 1877 (P, US). CERRO LARGO: Río Negro y a: Palleros, *Rosengurtt* B2044 (US).

PARAGUAY: Upper part of River Apa, *Hassler* 8037 (S). BETWEEN RIO APA AND RIO AQUIDABAN: Centurión, *Fiebrig* 4009 (L); Caballero-cué, *Fiebrig* 4780 (L).

ARGENTINA: CORRIENTES: SAN MARTÍN: La Cruz boca rios Aguapey and Uruguay, *Ibarrola* 1792 (UC). Estacion Yapeyu-costa Uruguay, *Ibarrola* 1903 (S). MONTE CASEROS: Libertad, Costa, Arroyo Curuzú, *Ibarrola* 2491 (S). PASO DE LOS LIBRES: Arroyo Yatay, *Cristóbal et al.* 17 (UC). MISIONES: Candelaria, *G. J. Schwarz* 503 (US). Loreto, *Montes* 73 B (US). Posadas, *Vattuone & Bianchi* L. 92 (US). ENTRE RIOS: Concepcion del Uruguay, *Lorentz* Apr. 1876 (W).

MASCARENES: RÉUNION: St. Denis, *D'Alleizette* s.n. (L). MAURITIUS: *Commerson* 456 (L). *Bojer* s.n. (W). *Andersson* s.n. (S).

SUNDA ISLANDS: JAVA: PAROEROEA: Bantoer, *Backer* 36519 (L). Road from Bantoer (to) south coast, *Backer* 3876 (L). CELEBES: Boeton, *Kjellberg* 28 (L, S); *C. B. Robinson* 2494 (US). TIMOR: Collector not given (L).

MOLUCCAS: KISAR: E. of Wonreli, inland, *Bloembergen* 3867A (L). TANIMBAR: JAMDENA: Sifnana near Saumlaki, *Pleyte* 35 (L).

NEW GUINEA: PAPUA: CENTRAL DIV.: NAKEO: Baroka, *Brass* 3753 (US).

AUSTRALIA: NORTHERN TERRITORY: 25 mi. NNE of Mt. Sanford Outstation, *Perry* 2174 (US). QUEENSLAND: *Dietrich* s.n. (US). Near Morcstone Station, *Perry* 1010 (US).

This species is related to *Melochia tomentosa* L. The latter is usually a taller plant, with hairier leaves, often canescent on both surfaces.

The inflorescences of *M. tomentosa* are usually axillary, those of *M. pyramidata* are usually leaf-opposed. The fruit of *M. tomentosa* has a longer rostrum and is often supported by a longer stipe. The calyx of *M. tomentosa* is often longer (5–8.6 mm. vs. 3.7–6.2 mm. long).

The stem contains fine silky fibers (Fróes). The flowers open 8 a.m. and close 11 a.m. (Runyon).

51b. *Melochia pyramidata* L. var. *hieronymi* Schum. in Mart. Fl. Bras. 12(3):35. 1886.

Melochia pyramidata L. *Grisebachii* O. Ktze. Rev. Gen. Pl. 3(2):25. 1898.

Melochia pyramidata L. *flava* O. Ktze. Rev. Gen. Pl. 3(2):25. 1898.

Melochia pyramidata L. var. *Hieronymi* Schum. f. *follis luteo variegatis* and f. *transitoria*, both Schum. & Hassl. Bull. Herb. Boiss. II, 4:70. 1903.

Melochia tomentosa L. var. *matlogrossensis* R. E. Fries, Svensk. Vet. Akad. Handl. 42(12):10. 1908.

?*Melochia pyramidata* L. var. *paraguariensis* Hassl. f. *intermedia* Hassl. Buenos Aires Univ. Nat. Inst. Bot. y. Farm. Trab. 21:85. 1909.

?*Melochia pyramidata* L. var. *pseudotomentosa* Hassl. Repert. Nov. Sp. Fedde 8:122. 1910.

This variety is hairier than the typical variety. The upper surface of the leaf is hirsute and the lower surface is tomentulose. Often there are more flowers per umbel.

TYPE LOCALITY: Southern Brazil, Paraguay, and northern Argentina. Sellow 1751 (W) collected in Brazil, and cited below, is selected as lectotype.

DISTRIBUTION: Northern South America to northern Argentina.

VENEZUELA: FEDERAL DISTRICT: Caracas, *van Landsberge* 340 (S). Above Caracas, Middle Catuche wood, *Pittier* 9812 (US). Middle Cotiza, near Caracas, *Pittier* 7059 (GH, US). Road from country club to Rio Chacito, *Lasser* 656 (US).

COLOMBIA: NORTE DE SANTANDER: Valle del río Peralonso near Santiago, *Molina & Barkley* 18 N. S. 137 (US). SANTANDER: Near Quebrada Monte Grande 2 km. W. of Jordan, *Langenheim* 3095 (US). CUNDINAMARCA: Jerusalén, collector not given (US). TOLIMA: Valle del río Magdalena, Armero, *Cuatrecasas* 10486 (US), 10486-B (US). VALLE DEL CAUCA: Cali Loma, *Dryander* 2200 (US). Cuchilla, E. of Zarzal, *Pennell et al.* 8529 (GH). CAUCA: Cali and vicinity, *Figueroa P.* 906 (US). La Manuelita, near Palmira, E. side of Cauca Valley, *Pittier* 791 (US).

PERU: LORETO: Tarapoto, *Ule* 6529 (L). JUNÍN: La Merced, *Macbride* 5312 (GH, US). TARMA: Between La Merced and Quimiri, Chanchamayo, *Ferreya* 3693 (US).

BOLIVIA: SANTA CRUZ: SARA: Rio Surutú, *Steinbach* 7241 (K, S, US neg. 5420 ex K).

BRAZIL: Sellow 1751 (W, lectotype of the variety). PARÁIBA: Experimental Station de Alagoinha, *Deslandes* 4 (RB). GOIÁS: Fazendina in Via ad Caretao, *Pohl* 1738 (W). MATO GROSSO: Corumbá, *Malme* 3072 (S, type of *M. tomentosa* L. var. *matlogrossensis* R. E. Fries, also US neg. 5609); *Hoehne* 3010 (R, US), 3011 (R), 3012 (R); *Pereira et al.* 113 (RB). Cáceres, *Hoehne* 4335 (R). SÃO PAULO: Rio Piracicaba, *de Lima* s.n. (RB). Iporanga, margin of Rio Ribeira, *Hatschbach* 5190 (US). RIO GRANDE DO SUL: Fazenda Santa Cecilia near S. Gabriel, *Rambo* (PACA 25662), (PACA 25765).

PARAGUAY: Villa Rica, *Jorgensen* 3917 (S, US). Est. Armonia, *Anisits* 2000 (S). Cordillera de Altos, *Fiebrig* 370 (K, L). Asunción, ?*Diciers* 20 (K). Central Paraguay, *Morong* 588 (US). ALTO PARAGUAY: Chaco, 21° S. Lat., *Fiebrig* 1275 (S).

ARGENTINA: SALTA: Chicoana, *Zabala* 121 (GH, US). Capital, *Krapovickas* 1445 (S). Salta City, N. Caseros, *Wall & Sparre* 1187 (S). ANTILLAS: Cerro Negro, *Venturi* 10404 (S). GUACHIPAS: Alemania, *Venturi* 9914 (GH, S, US), 9971 (S, US). TUCUMÁN: Estacion agricola experimental, *Skottsberg* s.n. (S). Camino a San Andrés, *Cuezzo* 28 (S). Tusca and Taruca Pampa at La Cruz, *Lorentz & Hieronymus* 61 (US). CAPITAL: Mataderos ?, *Venturi* 2190 (A, S), 2190 in part (US). TRANCAS: Vipos, *Venturi* 5017 (GH, US). TAFI: Tipa, *Rocha* 3656 (US). Cuesta Pariquillo, *Venturi* 2621 (US). SANTIAGO DEL ESTERO: C. PELLEGRINI: Cerro del Remate, *Venturi* 5654 (US). CHACO: *Jorgensen* 2541 (US). Fontana, *Meyer* 2309 (GII). CORRIENTES: CONCEPCION: Loma Alta, *S. Ybarrola* 1116 (US). MISIONES: Posadas, Bonpland, *Ekman* 1975 (S). CANDIARIA: Puerto Santa Ana, *G. J. Schwarz* 612 (UC). Arroyo "Martin chico," *G. J. Schwarz* 568 (UC).

Section V. *Physodium* (Presl) A. Goldberg, stat. nov.

Physodium Presl, Rel. Haenk. 2:150. 1835.

Shrubs or small trees 2–10 meters high, the young stems and petioles tomentulose, hairs yellow brown, stellate, sometimes also glandular, 0.1–0.7 mm. long, internodes 1.0–5.5 cm. long; stipules 2.5–6.0 mm. long, 0.2–1.2 mm. wide, deltoid-acuminate, lanceolate or nearly linear, densely pubescent, hairs stellate, 0.1–0.6 mm. long; petiole 1–3.5 cm. long.

Lamina 3.5–14.8 cm. long, 2.6–11.5 cm. wide, ovate, one side usually larger than the other, the base rounded, truncate or cordate, sometimes oblique, the apex acute to acuminate, woolly or scabrous to the touch, the upper surface covered with stellate hairs 0.1–0.5 mm. long, sometimes also with resin-colored granules or pulverulent, the lower surface tomentulose, hairs stellate, 0.2–0.6 mm. long, young leaves densely covered with hairs, older leaves sometimes subglabrate, the margin irregularly crenate-serrate, serrations 1.5–7.5 mm. wide, 0.5–3.2 mm. high, 5–7 pairs of primary veins, 2 or 3 are basal.

Inflorescences terminal, extending 2–9 cm. beyond the first leaf, corymbiform, the ultimate divisions umbellate, 3–9 flowers per umbel, also axillary, 1.5–12.5 cm. long, in the axils of the upper 1–11 or more leaves, the peduncle 0.3–2.7 cm. long, with a primary branch 0.2–2.4 cm. long, a secondary one 0–1.3 cm. long, and a tertiary one 0–0.7 cm. long, the pedicel 2.5–13 mm. long at anthesis, becoming 5–19 mm. long in the fruiting stage, covered with stellate, and sometimes also glandular hairs 0.1–0.8 mm. long; bracts 1.5–6.2 (–11) mm. long, 0.2–0.7 (–1.6) mm. wide, lanceolate to nearly linear, densely covered with stellate, and sometimes also glandular hairs 0.1–0.6 mm. long.

Calyx rose, rose purple or yellow, densely pubescent, hairs stellate and sometimes also glandular, 0.1–0.8 mm. long, at anthesis 7–15 mm. long, 3.6–8.5 mm. wide, with teeth 1.7–4.5 mm. long, 1.5–3.5 mm. wide, accrescent, becoming 15–36 mm. long, 8–19 mm. wide, with teeth 3–12 mm. long, 3–10 mm. wide, the teeth deltoid-acute or deltoid-acuminate, the sinus acute, inflated calyx acutely pentagonal, reticulate-veined and with a midrib leading to each tooth and a vein to each sinus; sometimes with glandular tissue between the calyx and corolla for 0.5–1.2 mm. and 0.8–1.0 mm. high between the bases of the petals; petals red, pink, yellowish red, light blue, violet blue, violet or mauve, 8–17.4 mm. long, 2.0–9.5 mm. wide, oblanceolate, obdeltoid or obovate-oblong, spatulate, sometimes slightly emarginate at the apex, attached to the staminal tube for 2.5 mm., the claw 2.5–6.5 mm. long, somewhat thickened, with a few glandular hairs and sometimes also forked and stellate hairs, 0.1–0.7 mm. long on both surfaces; anther 1.4–2.6 mm. long, 0.6–1.2 mm. wide, oblong, slightly emarginate at both ends.

Longistylous form. Stamens 5.3–6.8 cm. long, with a few forked or stellate hairs 0.1–0.2 mm. long at the base of the staminal tube, the filaments free for 0.4–1.4 mm.; staminodes 0–0.2 mm. long; pistil 6.2–7.8 mm. long, the styles 3.5–6.0 mm. long, free to the ovary, papillose and slightly clavate at the apex for 0.7–1.0 mm., with forked, stellate, and simple hairs 0.2 mm. long, the ovary globose, pentagonal, covered with stellate or glandular hairs 0.1–0.2 mm. long, the stipe 1–4.3 mm. long.

Brevistylous form. Stamens 6.2–10.3 mm. long, sometimes with very few stellate hairs 0.1 mm. long at the base of the staminal tube, the filaments free for 1.5–5.0 mm.; staminodes 0–1.2 mm. long; pistil 3.2–6.5 mm. long, the styles free to the ovary, 0.8–5.3 mm. long, papillose for 0.3–1.0 mm. at the apex, the stipe 1–4.5 mm. long.

Fruit 5.3–7.7 mm. long, 6.7–8.8 mm. wide, globose, acutely pentagonal, slightly retuse at the apex, the sulci between the carpels rather deep, extending a third to half way to the center of the fruit, tomentulose, hairs stellate and sometimes also glandular and simple, 0.1–0.5 mm. long, the stipe 4.3–6.7 mm. long; dehiscence loculicidal all along the dorsal suture; seeds 2.8–3.9 mm. long, 1.6–2.5 mm. wide, obovate, trigonal or somewhat flattened, dark brown, 1 or 2 per cell.

Flowering specimens collected December–April, June, July, September, October; fruiting ones, December–July.

TYPE SPECIES: *Melochia corymbosa* (Presl) Meissn. ex Steud.

DISTRIBUTION: Sinaloa to Oaxaca, Mexico, in wet woods, on rocky, shady canyon slopes in the short-tree forest, on wooded, grassy hills, in shade along small streams, on hills covered with dry-season deciduous forest, at 250–1,650 meters elevation.

52. *Melochia adenodes* A. Goldberg, sp. nov.

Frutex vel arbor parva; laminis foliorum asymmetricice ovatis, basi rotundatis, truncatis vel cordatis, obliquis, apice acutis vel acuminatis, juvenilibus utrinque dense stellato-tomentosis; inflorescentiis terminalibus et axillaribus, corymbiformibus sed ramulis ultimis cymoso-umbellatis, pedicellis calicibusque pilis glandulosis valde vestitis; petalis 8–12 mm. longis, calycem per anthesin haud superantibus; staminodiis 0.2–1.2 mm. longis.

A shrub to small tree 2–10 meters high, bark ashy, the young stems and petioles densely covered with yellow-brown stellate hairs 0.1–0.3 mm. long, glandular hairs sometimes also present, internodes 1–4.3 cm. long; stipules soon deciduous, 2.6–3.4 mm. long, 0.5–0.6 mm. wide, lanceolate, densely covered with stellate hairs 0.1–0.3 mm. long; petiole 1–3.5 cm. long.

Lamina 4–14.8 cm. long, 2.6–11.5 cm. wide, ovate, one side of the leaf usually larger than the other, the base usually oblique, truncate, cordate or rounded, the apex acute to acuminate, young leaves densely covered with stellate hairs, 0.1–0.3 (–0.5) mm. long, sometimes also with resin-colored granules, or pulverulent on the upper surface, woolly to the touch, older leaves subglabrate, the margin irregularly crenate-serrate, serrations 1.7–7.0 mm. wide, 0.5–2.5 mm. high, 6 or 7 pairs of primary veins, 2 (–3) are basal.

Inflorescences 3–12.5 cm. long, in the axils of the upper 1–11 or more leaves, also terminal extending 3–9 cm. beyond the first leaf, corymbiform, the ultimate divisions umbellate, 3–6 flowers per umbel, the peduncle 0.6–2.8 cm. long, with a primary branch 0.2–2.4 cm. long, a secondary one 0–1.3 cm. long, and a tertiary one 0–0.7 cm. long, the pedicels 6–12 mm. long at anthesis, 10–19 mm. long in the fruiting stage, covered with glandular hairs 0.3–0.8 mm. long and stellate hairs 0.1–0.2 mm. long; bracts 1.5–3.7 mm. long, 0.2–0.5 mm. wide, lanceolate to nearly linear, acute, densely covered with stellate, and sometimes also glandular hairs 0.1–0.3 mm. long.

Calyx rose, rose purple or yellow, covered with glandular hairs 0.2–0.6 mm. long and fewer stellate hairs 0.1–0.2 mm. long, at anthesis 11.1–15 mm. long, 7.7–8.3 mm. wide, with teeth 2–4.5 mm. long, 2–3.5 mm. wide, accrescent, becoming 1.8–3.6 cm. long, 1.1–1.9 cm. wide, with teeth 5–12 mm. long, 6–10 mm. wide, the teeth deltoid-acute or deltoid-acuminate, the sinus acute, inflated calyx acutely pentagonal, reticulate-veined and with a midrib leading to each tooth and a vein to each sinus; internode between the calyx and the corolla 0.7–1.2 mm. long; petals pink, red, yellowish red, or pinkish orange, 8–12 mm. long, 2–2.7 mm. wide, oblanceolate or obovate-oblong, spatulate, attached to the staminal tube for 2.5 mm., the claw 2.5–6.5 mm. long, thickened, a few glandular hairs 0.1–0.2 mm. long, and

sometimes also fewer stellate hairs 0.1 mm. long, scattered over both surfaces of the petal.

Longistylous form. Stamens 6.8 mm. long, the filaments free for 1.3 mm., the anther 1.7–1.8 mm. long, 1.1 mm. wide, oblong, slightly emarginate at both ends; staminodes extending 0.2 mm. beyond the staminal tube; pistil 7.5–7.8 mm. long, the styles 6 mm. long, free to the ovary, papillose and slightly clavate for 1 mm. at the apex, scattered simple and forked hairs 0.2 mm. long all along the styles, the ovary globose, covered with glandular hairs 0.1 mm. long, the stipe 4.3 mm. long.

Brevistylous form. Stamens 6.2–10.3 mm. long, the filaments free for 1.5–5.0 mm., very few stellate hairs 0.1 mm. long at the base of the staminal tube, the anther 2–2.6 mm. long, 1–1.2 mm. wide, oblong, emarginate at both ends, more so at the base; staminodes extending 0.2–1.2 mm. above the staminal tube; pistil 3.2–6.5 mm. long, the styles 1.5–5.3 mm. long, free to the ovary, papillose and slightly clavate for 0.3–1.0 mm., the ovary globose, densely covered with glandular hairs, and sometimes also stellate hairs, less than 0.1 mm. long, the stipe 2.7–4.5 mm. long.

Fruit 6.3–7.7 mm. long, 7.5–8.0 mm. wide, globose, rather acutely pentagonal, slightly retuse at the apex, the sulci between the carpels fairly deep, extending half way to the center of the fruit, covered with stellate, glandular and simple hairs 0.1–0.3 mm. long, the stipe 6–6.7 mm. long; dehiscence loculicidal all along the dorsal suture; seeds 3–3.7 mm. long, 1.7–2.1 mm. wide, obovate, somewhat flattened, brown.

Flowering specimens collected from December to April (dry season); fruiting ones, from December to June.

Key to Varieties of *M. adenodes*

1. Calyx teeth acute, typically 5–6 mm. long in the fruiting stage.

52a. *M. adenodes* var. *adenodes*

1. Calyx teeth acuminate, typically 11–12 mm. long in the fruiting stage.

52b. *M. adenodes* var. *acuminata*

52a. *Melochia adenodes* A. Goldberg var. *adenodes*

The calyx is rose to rose purple, and the teeth are acute and typically 5–6 mm. long in the fruiting state. The petals are rose to red.

TYPE LOCALITY: The type was collected by G. B. Hinton, no. 16203, at Huizontla, Coalcoman, Michoacán, Mexico, and is cited below.

DISTRIBUTION: Jalisco to Oaxaca, Mexico, in woods, in shade along small streams, on wooded grassy hills, on hills covered with dry-season deciduous forest, at 200–1,500 meters elevation.

MEXICO: S. Carlos, *Liebmann* 5888? (US). JALISCO: San Sebastian and vicinity, *Nelson* 4120 (US); *Mexia* 1485-a (MICH, US). Santa Cruz de Vallarta, *Mexia* 1289 (US). Toward La Resolana 16 mi. SSW. of Autlán, *R. L. & C. R. Wilbur* 1451 (MICH, US). Southwest of Autlán, toward Manzanillo, *McVaugh* 10231 (MICH, US). Along road from Barra de Navidad to Tequezquitlán, Concepción, and Autlán, *McVaugh* 11870 (MICH, US). MICHOACÁN: COALCOMAN: *Hinton* 12957 (US). Huizontla, *Hinton* 16203 (US, type). Aquila, *Hinton* 15815 (MICH, US). COLIMA: Manzanillo, *E. Palmer* 1372 in 1891 (MICH, US). GUERRERO: El Naranjo, *Nelson* 6987 (US). OAXACA: San Bartolo Yauhtepec, *C. & E. Seler* 1653 (US). TEQUILA: vicinity of Tuchahengo?, *Conzatti* 4552 (US).

This species has been misinterpreted by Standley (52) and others as *Physodium corymbosum* Presl. I have seen the type of the latter species. The calyx and pedicels do not have glandular hairs, those of *M. adenodes* are covered with glandular hairs. In his description Presl did not mention staminodes and his illustration did not show any, nor did I see any in the withered flower parts of the type, which is in the fruiting stage. Staminodes are quite evident in *M. adenodes*.

52b. *Melochia adenodes* A. Goldberg var. *acuminata* (Rose) A. Goldberg, comb. nov.

Physodium corymbosum Presl var. *acuminata* Rose, Contr. U.S. Nat. Herb. 1:309. 1895.

The calyx may be red or yellow and the teeth are acuminate and typically 11–12 mm. long in the fruiting stage. The petals are red or yellowish red to pinkish orange.

TYPE LOCALITY: Jalisco, Mexico. The type, cited below, was collected by E. Palmer, no. 86, in 1886.

DISTRIBUTION: Sinaloa to Mexico, Mexico, on rocky, shady canyon slopes in the short-tree forest, and on hills, at 280–750 meters elevation.

MEXICO: SINALOA: *Ortega* 5104 (US). Mazatlán, *Ortega* 5608 (US). Cerro Prieto, Pueblo de Coyotitan, *Montes & Salazar* 120 (US). Near Bacubirito, *W. Palmer* 1249 (US). BADIARGUATO: Arroyo de Carrisal, *Gentry* 5800 (MICH). Cerro Colorado, *Gentry* 5483 (MICH). DURANGO: Sianori, *Ortega* 5396 (US). JALISCO: Barranca of Guadalajara, *Pringle* 5882 (US); *E. Palmer* 86 in 1886 (MICH, US, type). Between La Venta de Nochitiltie and Barranquitas along Tepic-Guadalajara highway, *McVaugh* 12045 (MICH, US). MEXICO: TEMASCALTEPEC: Palmar, *Hinton* 7294 (US). MICHOACÁN: Monte de Loreto near Inguarán, *Langlassé* 17 (US).

53. *Melochia rhodocalyx* C. Koch & Bouché, Index Sem. Hort. Berl. 14. 1854.

PLATE 9

Physodium dubium Hemsl. Diag. Pl. Nov. 1:4. 1878.

A shrub to small tree 2–6 meters high, the young stems and petioles woolly, densely covered with yellow-brown stellate hairs 0.3–0.7 mm. long, internodes 1.5–5.5 cm. long; stipules 2.5–6.0 mm. long, 0.2–1.2 mm. wide, deltoid-acuminate to nearly linear, rather densely covered with stellate hairs up to 0.6 mm. long; petiole 1–3.5 cm. long.

Lamina 3.5–12.5 cm. long, 3.2–10.0 cm. wide, ovate, often slightly

oblique, the base rounded, truncate or cordate, woolly to the touch, hairs stellate, 0.2–0.5 mm. long, usually not overlapping on the upper surface, usually overlapping on the lower surface, the margin irregularly crenate-serrate, serrations 1.5–7.5 mm. wide, 0.5–3.2 mm. high, 5–7 pairs of primary veins, 2 (–3) basal, second basal pair extending about half way up the lamina.

Inflorescences terminal, extending 2–6.5 cm. beyond the first leaf, and axillary, 2–4 cm. long, in the axils of the upper 1–2 leaves, corymbiform, the ultimate divisions umbellate, 3–9 flowers per umbel, the peduncle 0.3–2.7 cm. long, with a primary branch 0.3–2.0 cm. long, and a secondary one 0.3–1.2 cm. long, the pedicels 5–13 mm. long at anthesis, becoming 8–15 mm. long in the fruiting stage, covered with stellate hairs 0.5 mm. long; bracts 3.2–6.2 mm. long, 0.2–0.7 mm. wide, lanceolate to nearly linear, densely covered with stellate hairs up to 0.6 mm. long.

Calyx rose, densely covered with stellate hairs 0.2–0.5 mm. long, at anthesis 10–13.3 mm. long, 6.2–8.5 mm. wide, with teeth 2.2–3.7 mm. long, 2.3–3.0 mm. wide, accrescent, becoming 1.5–2.3 cm. long, 1–1.4 cm. wide, with teeth 5 mm. long, 3 mm. wide, the teeth deltoid-acute to deltoid-subacuminate, the sinus acute, inflated calyx acutely pentagonal, reticulate-veined and with a midrib leading to each tooth and a vein to each sinus; glandular tissue extending for 0.5 mm. between the calyx and corolla and 0.8–1.0 mm. high between the bases of the petals; petals light blue, red, mauve or violet, 16–17.4 mm. long, 5.6–9.5 mm. wide, obdeltoid-spatulate, slightly emarginate at the apex, the claw 2.5–4.0 mm. long, somewhat thickened, a few simple, forked, and stellate hairs 0.1–0.2 mm. long on the abaxial surface near the base, scattered glandular hairs 0.1 mm. long on the adaxial surface.

Longistylous form. Stamens 5.3–6.8 mm. long, the filaments free for 1.0–1.4 mm., a few forked hairs 0.2 mm. long at the base of the staminal tube, staminodes none, or rarely extending 0.1 mm. beyond the staminal tube, the anther 1.6–1.8 mm. long, 0.7–1.0 mm. wide, oblong, slightly emarginate at both ends, slightly more so at the base; pistil 6.2–6.7 mm. long, the styles 4.0–5.5 mm. long, free to the ovary, papillose and slightly clavate for 0.7–1.0 mm. at the apex, forked and stellate hairs 0.2 mm. long at the base of the styles, the ovary globose, pentagonal, covered with stellate hairs 0.1–0.2 mm. long, the stipe 2.8–3 mm. long.

Brevistylous form. Stamens 8.3–8.5 mm. long, the filaments free for 3.4–3.7 mm., the anther 1.6–1.9 mm. long, 0.7–0.8 mm. wide, oblong, slightly narrower at the apex, emarginate at both ends or only at the base, more so at the base, no hairs on the androecium, staminodes none, or rarely extending 0.1 mm. above the staminal

tube, dentiform; pistil 3.5 mm. long, the styles 0.8–1.0 mm. long, free to the ovary, the ovary densely covered with stellate hairs 0.2 mm. long, the stipe 2.5 mm. long.

Fruit 6.4–7.5 mm. long, 6.8–8.8 mm. wide, globose, rather acutely pentagonal, slightly retuse at the apex, the sulci between the carpels fairly deep, extending half way to the center of the fruit, covered with stellate hairs 0.1–0.4 mm. long, the stipe 5 mm. long; dehiscence loculicidal along the dorsal suture; seeds trigonal, or somewhat flattened, 2.8–3.9 mm. long, 1.6–2.5 mm. wide, brown.

Flowering specimens collected in June, July, September and October; fruiting ones, in June and July.

TYPE LOCALITY: The species was described in 1854 from specimens grown in the Berlin Botanical Garden. The native locality was unknown to the authors. A specimen, cited below, labeled *Melochia rhodocalyx* was received by the Riksmuseum, Stockholm, Sweden, from the Berlin Botanical Garden in the above year. It may be an isotype.

DISTRIBUTION: Mexico to Oaxaca, Mexico, in wet woods, on lava beds, at the edge of a stream, on clay soil, at 1,200–1,650 meters elevation.

Cultivated in the Berlin Botanical Garden *Andersson* s.n. (S, ?isotype, also US neg. 5610).

MEXICO: MORELOS: Near Cuernavaca, *Rose & Painter* 6949 (US); *Pringle* 6335 (MICH, S, US, W). Xochiltepec, *Lyonnet* 2164 (US); *Lyonnet & Elcoro* 1136 (US). Yautepec, *Rose et al.* 8548 (US). Xochicalco, *Kenoyer* July 18, 1938 (MICH). MEXICO: TEMASCALTEPEC: Acatitlán, *Hinton* 4338 (S, US). GUERRERO: Limon Mt., *Rusby* 18 (US). Campo Morado, Mina, *Hinton et al.* 14472 (US). El Ocote, probably near Chapultepec according to *McVaugh* (40), *Langlassé* 1046 (US). OAXACA: Jayacatlan, *L. C. Smith* 14 (US). Six miles above Domingullo, *Nelson* 1847 (US).

Hemsley (25) stated, "*Physodium* does not appear to differ generically from *Melochia*; but I have followed Bentham and Hooker in referring this plant to Presl's genus." Hemsley used *Andrieux* no. 507 (K), collected between Acatlán and Chila, Puebla, Mexico, as the type.

Schumann (48) considered *Physodium* Presl to be a synonym of *Melochia* L.

The petals of this species exceed the calyx in length at anthesis, those of *M. adenodes* A. Goldberg do not. The petals of *M. corymbosa* (Presl) Meissn. ex Steud. are considerably shorter than those of *M. rhodocalyx*.

54. *Melochia corymbosa* (Presl) Meissn. ex Steud. Nom. Bot. II, 2:123. 1841.
Physodium corymbosum Presl, Rel. Haenk. 2:150, pl. 72. 1835.

A sparsely branched frutex to small tree 4.5–6.0 meters high, the

young stems and petioles tomentulose, hairs yellowish brown, stellate, 0.2–0.6 mm. long, internodes 1.5–3.5 cm. long; stipules 4 mm. long, 0.7 mm. wide, deltoid-acuminate, densely pubescent, hairs stellate, 0.3 mm. long; petiole 1–2 cm. long.

Lamina 4.8–9.0 cm. long, 3.3–7.0 cm. wide, broadly ovate, oblique, the base rounded to subcordate, the apex acute to acuminate, scabrous or woolly to the touch, the upper surface greenish, covered with stellate hairs 0.2–0.5 mm. long, the lower surface lighter green, tomentulose, hairs stellate, 0.3–0.6 mm. long, the margin irregularly crenate-serrate, serrations 1–6 mm. wide, 0.5–2.3 mm. high, 5–7 pairs of primary veins, 2 or 3 are basal.

Inflorescences terminal, extending 2.5–5.5 cm. beyond the first leaf, corymbiform, the ultimate divisions umbellate, about 5 flowers per umbel, sometimes also axillary, 1.5 cm. long, the peduncle 1 cm. long with a primary branch 0.8–1.3 cm. long, a secondary one 0.4 cm. long, and sometimes a tertiary one 0.2 cm. long, the pedicel 2.5–3.5 mm. long, becoming 5–13 mm. long in the fruiting stage; bracts deciduous, 4.5 mm. long, 0.4 mm. wide, nearly linear, with stellate hairs 0.2–0.3 mm. long.

Calyx 7 mm. long, 3.6 mm. wide, the teeth 1.7–1.8 mm. long, 1.5 mm. wide, deltoid-acute, accrescent, becoming membranous, acutely pentagonal, 1.7–2.3 cm. long, 0.8–1.6 cm. wide, the teeth 3–5 mm. long, 5 mm. wide, densely pubescent, hairs stellate, 0.1–0.8 mm. long, the sinus acute; petals 9.7 mm. long, 2.1 mm. wide, oblanceolate, with scattered glandular hairs 0.1 mm. long on the axial surface and a line of stellate hairs 0.2–0.7 mm. long on the midrib, or a few simple hairs at the base, of the abaxial surface, the claw 2.5 mm. long.

Longistylous form. Stamens 5.7 mm. long, the filaments free for 0.4 mm., staminodes none, the anther 1.4 mm. long, 0.6 mm. wide; pistil developed to fruiting stage, the styles 3.5 mm. long, free to the ovary.

Brevistylous form. Stamens 7 mm. long, the filaments free for 3.5–4.0 mm., the anther 1.7–1.9 mm. long, 0.7–0.8 mm. wide; pistil 3.2 mm. long, the styles 1.3 mm. long, free to the ovary, papillose for 0.6 mm. at the apex, the ovary densely covered with stellate hairs 0.2 mm. long, the stipe 1 mm. long.

Fruit 5.3–7.2 mm. long, 6.7–9.0 (–10) mm. wide, globose, acutely pentagonal, the angles without points, the apex retuse, the sulci between the carpels extending a third to half way to the center of the fruit, tomentulose, hairs stellate, 0.3–0.5 mm. long, the stipe 4.3–6.0 mm. long; dehiscence loculicidal along the dorsal suture; seeds 3–3.7 mm. long, 1.6–2.4 mm. wide, dark brown, 1 or 2 per cell.

Flowering and fruiting specimens collected in July.

TYPE LOCALITY: The type, cited below, was collected by Haenke in western Mexico.

DISTRIBUTION: "Western Mexico" and Oaxaca, Mexico, at 750 meters elevation.

MEXICO: "Western Mexico," Haenke (PR 174400a, b, c, d, type and also US neg. 5554); ?Haenke (W). OAXACA: Tomellin Canyon, Pringle 4751 (S, US).

This species differs from *Melochia adenodes* A. Goldberg in the absence of glandular hairs on the calyx and pedicels, and in the absence of staminodes. It differs from *Melochia rhodocalyx* C. Koch & Bouché in having considerably smaller petals.

New Taxa, New Names, and New Combinations

Melochia L., section *Physodium* (Presl) A. Goldberg, comb. et stat. nov.

Melochia L., section *Pyramis* A. Goldberg, nom. nov.

Melochia adenodes A. Goldberg, sp. nov.

Melochia adenodes A. Goldberg var. *acuminata* (Rose) A. Goldberg, comb. nov.

Melochia chamaedrys St.-Hil. var. *decumbens* (R. E. Fries) A. Goldberg, comb. et stat. nov.

Melochia thymifolia (Presl) A. Goldberg, comb. nov.

Melochia tomentosa L. var. *speciosa* (S. Wats.) A. Goldberg, comb. et stat. nov.

Melochia villosa (Mill.) Fawc. & Rendle var. *regnellii* (Schum.) A. Goldberg, comb. nov.

Melochia villosa (Mill.) Fawc. & Rendle var. *tomentosa* (Schum.) A. Goldberg, comb. nov.

Melochia werdermannii A. Goldberg, sp. nov.

Excluded and Doubtful Taxa

Altheria Madagascariensis DC. Prodr. 1:493. 1824.

The description is inadequate for a determination.

Antiphylla serrata Rafin. New Fl. Amer. 4:16. 1836.

Antiphylla Rafin. is attributed to *Melochia* in Index Kewensis (30) and by Dalla Torre & Harms (7), but it probably belongs to the Capparidaceae or Cruciferae.

Melochia acutangula Span. in Linnæa 15:174. 1841.

The description is inadequate for a determination.

Melochia Berteriana Balb. ex DC. Prodr. 1:492. 1824, is a *Waltheria* according to Index Kewensis (30).

Melochia Borbonica Cav. Diss. 6:321. 1788.

The illustration is very reminiscent of *Melochia nodiflora*, but the description does not correspond to that species.

Melochia capitata, Index Kewensis (30), erroneously attributed to Boj. Hort. Maurit. 38. 1837.

Melochia corymbosa (DC.) Hemsl. Biol. Centr. Amer. Bot. 1:130. 1879 = *Riedleia corymbosa* [Moc. & Sessé] ex DC., which see.

Melochia depressa L. Sp. Pl. 674. 1753.

I have examined a microfiche photograph, taken by the International Documentation Centre, of a specimen in the Linnaean Herbarium so labeled by Solander. The specimen appears to belong to the Malvaceae.

Melochia hirsuta Turcz. Bull. Soc. Nat. Mosc. 36(1):570. 1863.

The description is inadequate for a determination.

Melochia hispida Hook. & Arn. Bot. Beech. Voy. 60. 1841.

The description is inadequate for a determination and the type cannot be located.

Melochia mollissima Desf. Tabl. ed. I, 148. 1804, nomen nudum; Pers. Syn. 2:218. 1807.

A small fragment ex P so labeled belongs to the Malvaceae. The description in Persoon is inadequate for a determination.

Melochia nipensis Britt. Mem. Torr. Bot. Cl. 16:81. 1920, is a *Waltheria*.

Melochia ovata Desf. Tabl. ed. II, 172. 1815 = *Melhania abyssinica* according to Index Kewensis (30).

Melochia peruviana Desr. in Lam. Encyc. 4:83. 1797, based on *Melochia depressa* L. in Cav. Diss. 6:320, pl. 173, fig. 1. 1788, appears to be close to *Melochia chamaedrys* St.-Hil., but unlike the latter, it has only one flower per leaf axil and the leaves are tomentose.

Melochia pulverulenta Miers, Proc. Roy. Hort. Soc. 4:185. 1865.

The description is inadequate for a determination.

Melochia rotundifolia Sessé & Moc. Pl. N. Hispan. 1:106. 1889, is a *Pterostemon*.

Melochia trigyna L. ex Jackson, Index Linn. Herb. 103. 1912, nomen nudum.

Melochia truncata Wall. Cat. No. 1196 K. 1929, is a *Sida* according to Index Kewensis (30).

Melochia truncata Willd. Sp. Pl. 3:601. 1801 = *Melochia corchorifolia* L. according to Index Kewensis (30), but the obcordate, cuncate lamina, monopetalous corolla, 10 stamens, and reticulate seeds of the description are not *M. corchorifolia* characters.

Melochia varronifolia Desf. Cat. Hort. Par. III, 252. 1829, nomen nudum.

Physocodon brachybotrys Turcz. Bull. Soc. Nat. Mosc. 31(1):213. 1858.

The description is inadequate for a determination.

Riddelia antiphylla Rafin. New Fl. Amer. 4:16. 1836, is attributed to *Melochia hirsuta* Cav. in Index Kewensis (30), but the fruit is too long to be that of a *Melochia* and the seeds differ in shape from those of *Melochia*.

Riedleia Berteriana DC. Prodr. 1:492. 1824, is a *Waltheria* according to Index Kewensis (30).

Riedleia Borbonica (Cav.) DC. Prodr. 1:491. 1824 = *Melochia Borbonica* Cav.

Riedleia capitata Boj. Hort. Maurit. 38. 1837, nomen nudum.

Riedleia corymbosa [Moc. & Sessé] ex DC. Prodr. 1:491. 1824.

The description is inadequate for a determination. The petals are stated to be twice the size of those of *Riedleia odorata* (L.f.) DC. Prodr. 1:491. 1824. Very few species of *Melochia* have petals that large.

Riedleia depressa (L.) DC. Prodr. 1:491. 1824 = *Melochia depressa* L.

Riedleia eriantha DC. Prodr. 1:492. 1824, belongs to the Malvaceae according to Schumann (47).

Riedleia odorata DC. Prodr. 1:491. 1824 = *Melochia odorata* L.f. and *Melochia umbellata* (Houtt.) Stapf.

Riedleia Peruviana (Desr. in Lam.) DC. Prodr. 1:491. 1824 = *Melochia peruviana* Desr. in Lam.

Riedleia setulosa Miq. Hov. & De Vriese Tijdschr. 10:80. 1843 probably is a *Sida*.

Riedleia truncata (Willd.) DC. Prodr. 1:491. 1824 = *Melochia corchorifolia* L. according to Index Kewensis (30), but De Candolle stated that the flower is solitary and pedunculate whereas *M. corchorifolia* has a capitate inflorescence.

Riedleja hyptoides Turcz. Bull. Soc. Nat. Mosc. 31(1):210. 1858.
The description is inadequate for a determination.

Riedleja pteronema Turcz. Bull. Soc. Nat. Mosc. 31(1):208. 1858.
The description is inadequate for a determination.

Riedleja ramosissima Turcz. Bull. Soc. Nat. Moscow 36(1):571. 1863.
The description is inadequate for a determination.

Riedleja siphonandra Turcz. Bull. Soc. Nat. Mosc. 31(1):208. 1858.
The description is inadequate for a determination.

Turnera paniculata Willd. in Schultes Syst. Veg. 6:678. 1820 = *Melochia graminifolia* St.-Hil., according to Schumann (47), but the description in Schultes is inadequate for a determination.

Visenia Berteriana (DC.) Spreng. Syst. 3:30. 1826, is a *Waltheria* according to Index Kewensis (30).

Visenia corymbosa (DC.) Spreng. Syst. 3:29. 1826 = *Riedleia corymbosa* [Moc. & Sessé] ex DC.

Visenia depressa (L.) Spreng. Syst. 3:30. 1826 = *Melochia depressa* L.

Visenia ferruginea Colla, Herb. Pedem. 1:432. 1833.

I have seen two specimens from the Colla Herbarium in a folder marked *Visenia ferruginea* with descriptions on the specimen sheets which could be interpreted as corresponding to the species description of *V. ferruginea*. One is a *Waltheria* and the other belongs to the Turneraceae.

Visenia madagascarensis Spreng. Syst. 3:30. 1826.
The description is inadequate for a determination.

Visenia scabra Colla, Herb. Pedem. 1:431. 1833.
The description is inadequate for a determination.

Visenia spicata Colla, Herb. Pedem. 1:431. 1833, belongs to the Malvaceae.

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3608

Melochia gardneri Sprague. Gardner 3608 (P, isotype).



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Second Botanical Garden Expedition to the Andes, 1928-29
Prof. Dr. H. G. Gentry, Director
No. 10908

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Second Botanical Garden Expedition to the Andes, 1928-29
Prof. Dr. H. G. Gentry, Director
No. 10908
Date: ...
Locality: ...
Collector: ...

Melochia leucantha Macbride. Stork & Horton 10908 (UC, type).



Melochia thymifolia Presl
Melochia thymifolia Presl
Melochia thymifolia Presl
Melochia thymifolia Presl

TYPUS

Melochia thymifolia (Presl) A. Goldberg. *Haenke* (PR 174403 a, lectotype)

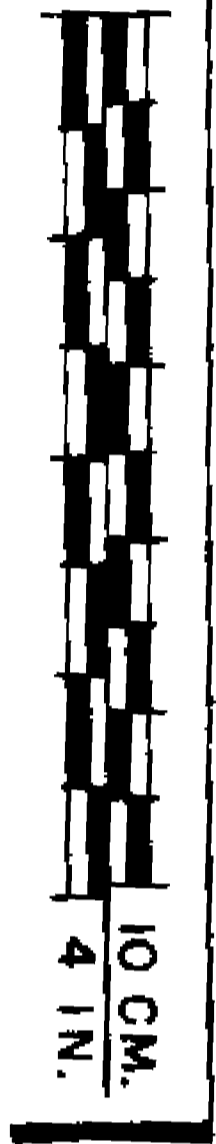
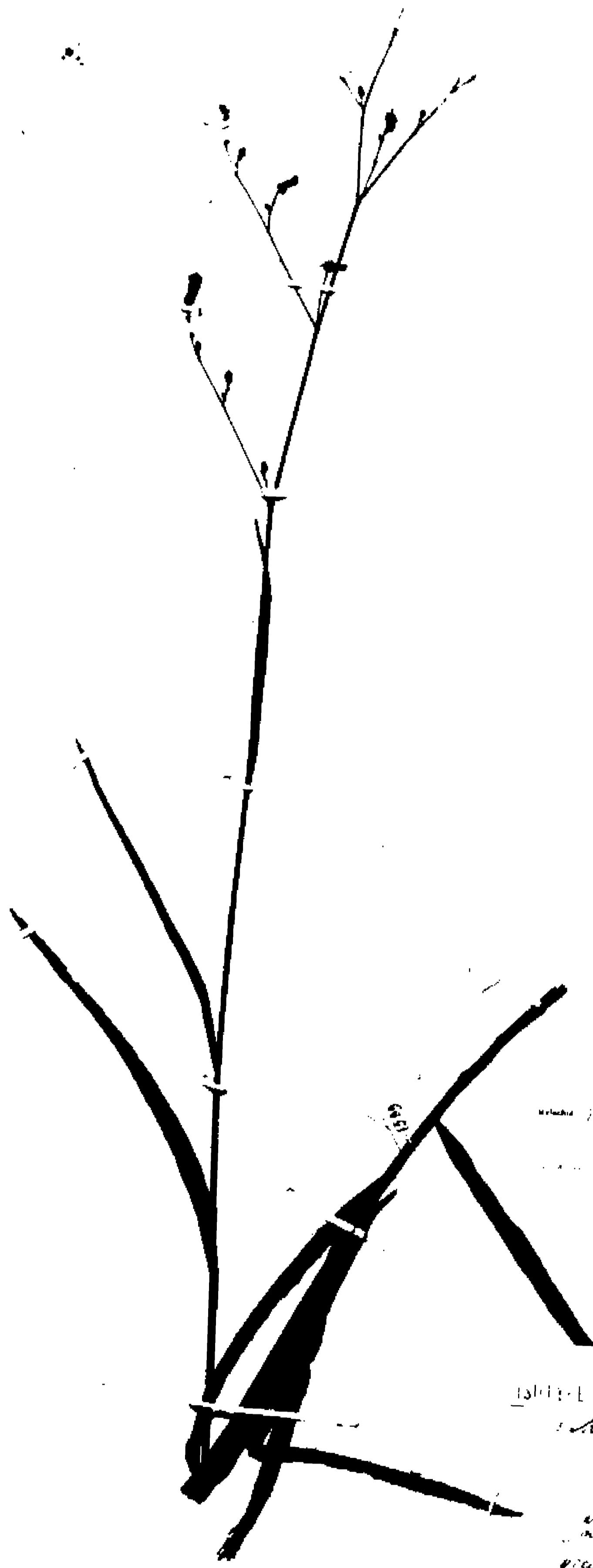


TYPUS

Melochia tomentella (Presl) Hemsl. Haenke (PR 174404 c, isotype).



Melochia villosa (Mill.) Fawc. & Rendle. Apical portion of flowering plant, approximately twice natural size.



Herb. Mus. Paris
 No. 1589
 21 1890



Herb. Mus. Paris
 No. 1589

Melochia graminifolia +

in parvitate...
 v. J. Bonnier, Illus. Bot.

Melochia graminifolia St.-Hil. St.-Hilaire 1589 (P, isotype).



Melochia anomala

503

Aug 1891
Lorentz 503
1891

Herb. Goettlingen
12
1891



Herb. Goettlingen

Melochia anomala Griseb. Lorentz 503 (GOETT, type).



Melochia werdermannii A. Goldberg, *nom. nov.*
type
 holotype: ...

Reise durch Ost-Bolivia Nr. 2006
 Dr. E. Werdermann

Melochia werdermannii A. Goldberg

Dept. Sta Cruz
 Misiones Guaraníes, Sta Cruz de la Sierra
 ca 2500-3000 m. alt.
 A. 1976

Melochia werdermannii A. Goldberg. *Werdermann 2006* (S-type).



Melochia rhodocalyx
Melochia rhodocalyx
Melochia rhodocalyx

Melochia rhodocalyx
Melochia rhodocalyx



Melochia rhodocalyx C. Koch & Bouché. *Andersson* s.n. (S, perhaps isotype).