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Glossostipula (Rubiaceae), a new genus from Mexico and Guatemala

DAVID H. LORENCE

RÉSUMÉ

LORENCE, D. H. (1986). *Glossostipula* (Rubiaceae), un genre nouveau du Mexique et du Guatemala. *Candollea* 41: 453-461. En anglais, résumé français.

Le genre *Glossostipula* (Rubiaceae: Gardenieae) est établi pour regrouper certains taxons atypiques jusqu'ici attribués aux genres *Genipa* et *Randia*. Deux espèces sont attribuées au nouveau genre: *G. blepharophylla* (Stanley) D. Lorence du Mexique occidental, et *G. concinna* (Stanley) D. Lorence réparti du Mexique occidental au Guatemala. Le genre est décrit et illustré, une carte de répartition fournie, les pollens illustrés et les relations du genre avec les genres voisins des Gardenieae sont discutées.

ABSTRACT

LORENCE, D. H. (1986). *Glossostipula* (Rubiaceae), a new genus from Mexico and Guatemala. *Candollea* 41: 453-461. In English, French abstract.

Glossostipula (Rubiaceae: Gardenieae) is established to accommodate several anomalous taxa previously referred to *Genipa* and *Randia*. Two species are assigned to the genus: *G. blepharophylla* (Stanley) D. Lorence from western Mexico, and *G. concinna* (Stanley) D. Lorence from western Mexico to Guatemala. The genus is described and illustrated, a distribution map is given, pollen photographs presented, and its relationship with allied genera in the Gardenieae are discussed.

Introduction

The world members of the tribe Gardenieae of the Rubiaceae have not been comprehensively reviewed since J. D. Hooker's treatment in *Genera Plantarum* (BENTHAM & HOOKER, 1873), although generic delimitations have been satisfactorily resolved for most of the tropical Asian members (TIRVENGADUM, 1978), and work is in progress for some of the African taxa (e.g., BRIDSON & ROBBRECHT, 1984). Certainly the tropical American members of the tribe have received virtually no attention as a whole, although some regional floristic treatments do exist (STANDLEY, 1921, 1926, 1934; STANDLEY & WILLIAMS, 1975; STEYERMARK, 1974; DWYER, 1980). In particular, considerable confusion exists as to the placement of species belonging to the complex of genera including *Casasia* A. Rich, *Genipa* L., and *Randia* Houtt. ex L. (LORENCE & DWYER, in press). These three genera have traditionally been separated on the basis of variable characters such as the presence of spines in *Randia* (not all species are armed), inflorescence structure (which varies markedly in dioecious members), on features that have been misinterpreted in herbarium collections such as floral sexuality, ovary structure and placentation (often not evident in dried material), or apparently trivial characters such as stigma shape (cf. STANDLEY, 1921; STANDLEY & WILLIAMS, 1975; STEYERMARK, 1974). On the other hand, characters provided by pollen and seed coat morphology have never been taken into account for the New World members, but are proving to be extremely useful in establishing generic delimitations.

During the course of revisionary and floristic studies in the Mexican and Central American members of the genus *Randia*, two species were encountered that could not be satisfactorily accommodated into that genus, i.e., *R. blepharophylla* Standley and *R. concinna* Standley (syn. *Genipa vulcanicola* Standley). Although STANDLEY (1926) published *R. blepharophylla* without comment as to its affinities, when he described *R. concinna* he stated that, "Only sections of the fruit are available for study. The true generic position of the tree will remain problematic until the flowers are collected. The large broad stipules are scarcely to be expected in the genus *Randia*, but at present no better generic disposition suggests itself" (STANDLEY, 1929). When later redescribing the same species as *Genipa vulcanicola*, STANDLEY (1937) stated, "A very distinct species, somewhat similar to *G. americana* L., which has acuminate stipules, leaves with more numerous nerves, and the calyx sericeous within, besides differing in various other characters".

Critical study has shown, however, that these two species are distinct from both *Randia* and *Genipa*. *Randia* was formerly considered to comprise a pantropical genus of from 200 to 300 species (e.g., STEYERMARK, 1974), but recent studies of the Paleotropical Gardenieae have shown it to be strictly Neotropical (e.g., FAGERLIND, 1934; TIRVENGADUM, 1978). *Randia* is characterized by the following combination of characters: pollen in permanent tetrads; ovary unilocular with two massive, intrusive parietal placentas; numerous ovules per placenta; stigma bilobed; fruit an indehiscent berry with a hard pericarp and sclerified endocarp; seeds surrounded by a dark brown or black placental pulp; seeds discoid with the exotesta cells having highly thickened, often papillose, radial walls. *Genipa* differs from *Randia* primarily in having tricolporate pollen in monads, but also has a unilocular ovary with two massive, intrusive parietal placentas, numerous ovules per placenta, a bilobed stigma, an indehiscent fruit with a sclerified endocarp, discoid seeds also surrounded by a placental pulp, and exostestal cells with highly thickened, smooth radial walls. The flowers, which are 5-merous in both genera, are strictly dioecious in *Genipa* and dioecious or rarely hermaphroditic in *Randia*.

The two anomalous species differ from both *Randia* and *Genipa* by their large, foliaceous stipules, 6-merous flowers, 4-lobed stigma, 4-locular ovary with axile placentation and few seeds per locule, fruits (also baccate and indehiscent) with an unsclerified endocarp, and seeds with thin-walled testa cells having only medially thickened smooth walls. As these species could not be accommodated into any other described genus of Gardenieae, a new genus is therefore proposed to accommodate them.

Systematic treatment

Glossostipula D. Lorence, **gen. nov.** (Fig. 1).

Type species: *G. concinna* (Standley) D. Lorence

Arbores vel frutices dioecii; stipulae intrapetiolares caducae linguiformes ovato-ellipticae integrae prope basin connatae. Inflorescentiae terminales, staminata thyrsoida 9-18-flora; flores staminales pedicellati vel sessilibus; cupula calycina obconica vel campanulata, 6 dentibus brevibus, denticulatis; corolla alba breviter hypocrateriformis, aestivatione contorta, 6 lobis ligulatis vel suborbicularibus margine eroso-ciliolato; tubo corollino extus glabro, intus glabro vel distaliter parce villosus; stamina 6 lobis corollae alterna sessilia exserta, antheris 4-ocularibus introrsis; stylus hirtellus, stigma 4-lobum. Flores pistillati solitarii terminale; hypanthium subglobosum; ovarium 4-loculare, placentatione axiali, utroque loculo 6-8 ovulis. Fructus solitarius terminalis globosus baccatus 4-ocularis, loculo seminibus 4-7 verticalibus; semina ellipsoideo-reniformia, testa fusca striato-sulcata.

Dioecious trees or shrubs with sympodial branching, sparsely to densely pubescent with simple, multicellular acicular trichomes, the cells uniseriate, the twigs with thin, peeling bark; stipules intrapetiolar, deciduous, large and linguiform, ovate or elliptic, green when fresh, venose, the veins subflabellate, forking and anastomosing, the bases connate, the margin entire, scarious, internally with brown digitate colleters basally, leaving a ring of colleters and trichomes along the stipule scar. Leaves simple, subcoriaceous to coriaceous, petiolate or sessile, glabrous or pubescent abaxially, those of a pair equal; lamina ovate, elliptic or obovate, the venation camptodromous to weakly festooned brochidodromous. Inflorescence terminal, glabrous or pubescent. Staminate in-

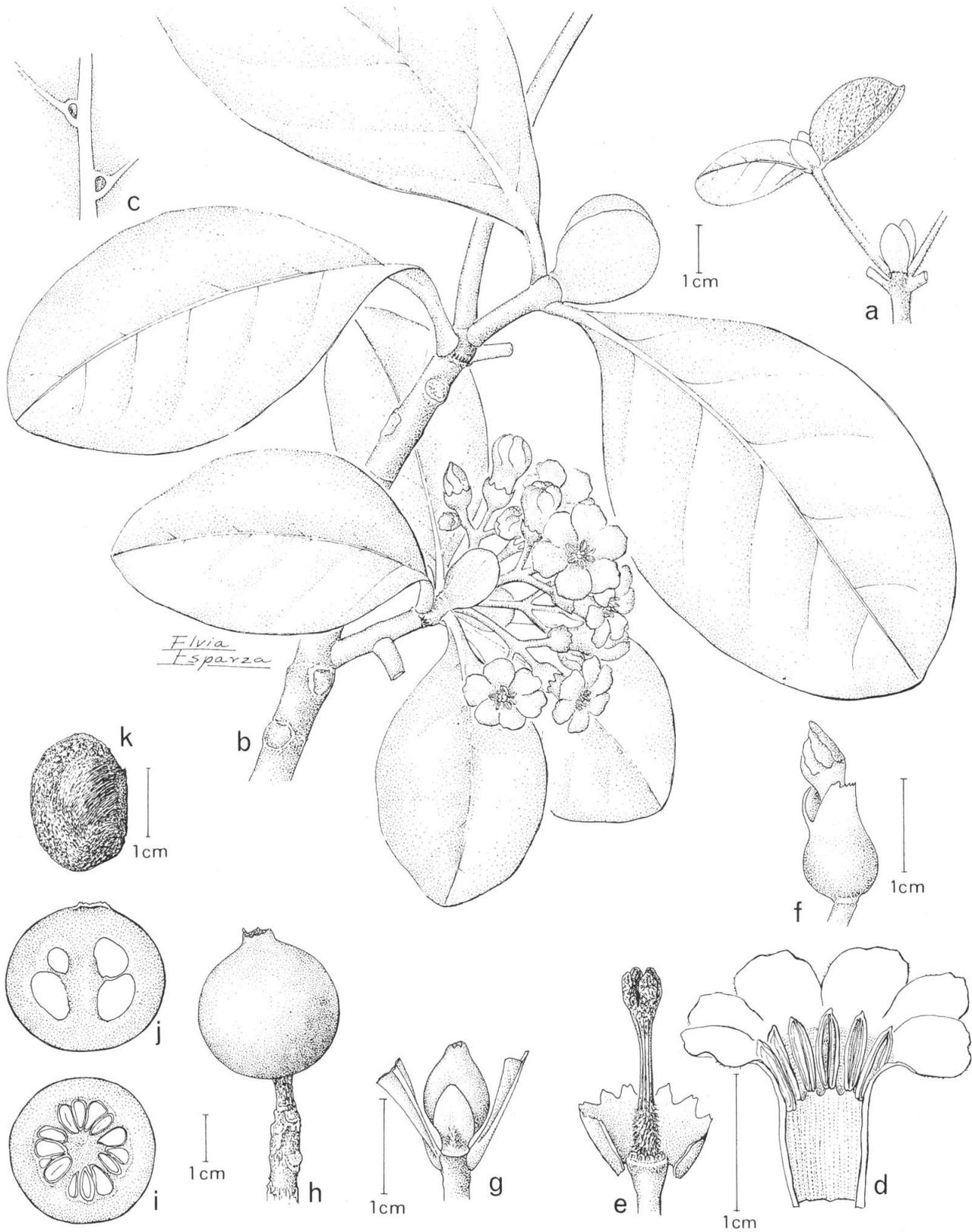


Fig. 1. — *Glossostipula blepharophylla* and *G. concinna*.

a, *G. blepharophylla*, twiglet with stipules and young leaves; **b-k**, *G. concinna*; **b**, flowering branch of staminate plant; **c**, detail of abaxial leaf surface showing domatia; **d**, staminate corolla, opened; **e**, hypanthium, calyx and style of staminate flower; **f**, pistillate flower in bud; **g**, young fruit; **h**, whole fruit; **i**, transverse section of fruit showing placentation and seeds; **j**, longitudinal section of fruit showing placentation and seeds; **k**, seed (a, González Ortega 573; b-e, Torres C. 4883A; f, Torres C. 6754; g-j, Breedlove 60026; k, Torres C. 4883B).

florescence a thyrses of 9-18 flowers, sessile or shortly pedunculate, with 3-5 primary branches subtended by 1-2 pairs of stipule-like bracts, the ultimate units dichasial. Staminate flowers pedicellate or subsessile, the hypanthium small, the ovary abortive, the calycine cup obconical-campanulate, the margin with 6 short apically denticulate lobes, the nectary disc undulate; corolla white, dextrorsely contorted in bud, shortly hypocrotiferiform at anthesis, 6-lobed, the lobes ligulate to suborbicular, the margins erose, ciliolate, the tube externally glabrous, internally glabrous or sparsely villous in the distal half, the style hirtellous, the stigma clavate, 4-lobed, the stamens alternate with the lobes, sessile, the anthers dorsifixed, exerted, recurved, ellipsoid, apiculate, tetrasporangiate, introrse; pollen radially symmetrical, isopolar, tricolporate, spheroidal or oblong, circular in polar view and elliptic or subcircular in equatorial view, the exine foveolate. Pistillate flowers solitary, terminal, subtended by a pair of stipule-like bracts, pedicellate or subsessile, the hypanthium swollen, subglobose, the calyx like that of the staminate flower, the ovary 4-locular, the placentation parietal, the placentas hemispherical, the ovules vertical, 6-8 per locule, the style hirtellous, the stigma 4-lobed, subglobose; corolla like that of the staminate flower but the stamens smaller, abortive. Fruit solitary, terminal, globose, smooth and glabrous, crowned by the persistent calycine cup, the pericarp fleshy, with scattered tanniferous idioblasts, the endocarp non-sclerified; seeds 4-7 per locule, not surrounded by a placental pulp, vertical, flattened, ellipsoid or reniform, the testa thin, striate-sulcate, the cells fusiform, thin-walled except for the smooth, medially thickened radial walls, the endosperm abundant, albuminous; embryo basal, erect, spatulate, the cotyledons appressed.

Taxonomic position

Because it lacks raphids and possesses an albuminous endosperm, *Glossostipula* belongs to the subfamily Cinchonoideae Raf. The large, fleshy indehiscent baccate fruits with large seeds embedded in a fleshy matrix, dioecious flowers with contorted aestivation, multiflowered staminate inflorescence and solitary pistillate flowers, and tricolporate pollen grains are all characteristic of the tribe Gardenieae.

Affinities

Glossostipula seems most closely allied to *Alibertia* A. Rich., as both genera share axile placentation, and the ovary is 3-5-locular in the latter genus. *Alibertia* differs in having 3-5-merous flowers, sessile, fasciculate staminate flowers with non-exserted stamens, pollen with a reticulate exine, persistent acute or long acuminate deltoid stipules, and testa cells with thickened outer and radial walls. *Glossostipula* also shares a number of characters with *Borojoa* Cuatrecasas from South America and Panama, including large, foliaceous stipules that are basally connate, intrapetiolar and have internal colleters (but are acuminate and dorsally carinate), a pair of stipule-like bracts subtending the flowers, solitary, terminal pistillate flowers, and a multicellular ovary with axile placentation. *Borojoa*, however, differs in its externally and internally densely sericeous corolla, sessile 4-5-merous staminate flowers disposed in terminal capitula, pistillate flowers with a 6-8-lobed stigma and 6-8-celled ovary, fruit with horizontally attached seeds, and seeds with the exotestal walls showing anastomosing external and radial thickenings. The new genus is also allied to *Duroia* L. f., which differs in its 5-12-merous flowers, and its unilocular fruits with 5-6 parietal placentas. *Posoqueria* resembles *Glossostipula* in having large, ovate or ligulate stipules, but they are generally persistent in *Posoqueria* which further differs by its long, tubular somewhat zygomorphic, hermaphroditic flowers, a two-celled ovary (also with axile placentation), and large, angulate seeds with a parenchymatous exotesta. Palynologically, *Glossostipula* seems most similar to *Genipa*, which also has tricolporate grains with a foveolate exine (Fig. 2). The generic name alludes to the tongue-like stipules.

Key to *Glossostipula*

1. Leaves sessile or subsessile, the petioles to 1.5 mm long, the margins ciliate; axils of secondary veins never domatiate nor barbate **1. *G. blepharophylla***
- 1a. Leaves with petioles 0.7-2 cm long, the margin glabrous or rarely hirtellous, never ciliate; axils of the secondary veins usually domatiate and also often barbate **2. *G. concinna***

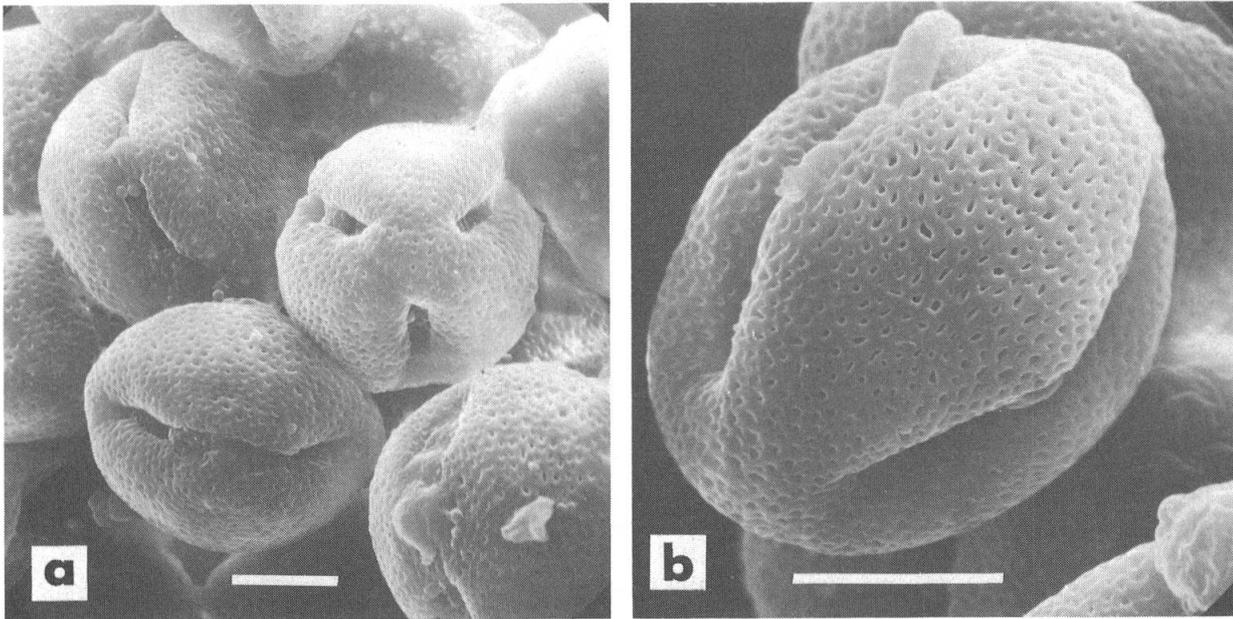


Fig. 2. — SEM photographs of unacetolyzed pollen of *Glossostipula concinna*.
a, group of grains, equatorial and polar views; **b**, equatorial view of single grain (*Breedlove 30080*). Scales = 10 µm.

1. *Glossostipula blepharophylla* (Standley) D. Lorence, *comb. nov.* (Fig. 1a).

— *Randia blepharophylla* Standley, *Contr. U. S. Natl. Herb.* 23(5): 1375. 1926. **Type:** Mexico. Nayarit, foothills of Sierra Madre, Tepic, between Aguacate and Dolores, 6.8.1897, *J. N. Rose 2028 sub US 300921* (holotype: US!; isotype: F!).

Dioecious shrubs or small trees, the bark purplish or grayish, scaling, the young twigs rufous hirtellous-villous, especially when young, the trichomes antrorse-spreading, 3-10-celled, 0.4-0.6 mm long, the mature twigs glabrate, 2.5-4 mm diam., slightly flattened and dilated at the nodes, the bark longitudinally wrinkled, reddish, peeling, the internodes 7-9(-17) cm long; stipules brown, venose, linguiform, ovate or obovate, 0.7-1.7(-2.2) cm long, 0.5-0.9(-1.7) cm wide, obtuse apically, dorsally strigose basally, connate into a sheath 1-5 mm long, internally with several digitate col-leters basally. Leaves sessile or subsessile; petioles to 1.5 mm long, adaxially flattened, abaxially rufous villous; lamina broadly ovate, broadly elliptic or broadly obovate-elliptic, 5-11 cm long, 4-7 cm wide (to 13.5 cm long and 10.5 cm wide on sucker shoots), the apex obtuse or rounded, the base obtuse, rounded or subcordate, the lamina slightly discolorous, subcoriaceous, drying dark brown, adaxially glabrous or sparsely pilose when young, lustrous, abaxially rufous villous, densely so when young, the 2° veins 5-8 pairs, camptodromous, the venation visible to 5° adaxially and to 3° abaxially, the margin thin, slightly revolute, ciliate. Staminate inflorescence a thyrse 3-4 cm long, 2.5-5 cm wide, sessile or the peduncle to 5 mm long, the axes densely rufous villous-hirtellous, the primary branches 3, these 3-15 mm long, the flowers 9-15, the pedicels 3-13 mm long, 0.5 mm diam., often bracteolate basally, the hypanthium obconical, ca. 1 mm long and wide, hirtellous, the calycine cup 2.5-3.5 mm long, 3-3.5 mm wide, sometimes splitting along one side, externally ± glabrous, internally glabrous, the margin scarious, minutely dentate with 6 broadly deltoid or obtuse lobes 0.2-0.5 mm long, 0.5-0.7 mm wide, each 3-4-denticulate apically. Corolla drying brown, 1 cm long in bud, at anthesis shortly hypocateriform, the lobes 6, spreading, ligulate, 4-6 mm long, 3-3.5 mm wide, truncate apically, the apex and margins erose, ciliate, the tube 6.5-8 mm long, 2-3 mm wide medially, externally glabrous, internally sparsely villous in distal half, the anthers ellipsoid, 2.5-3 mm long, 1 mm wide; style hirtellous, 1-1.1 cm long including the shallowly 4-lobed clavate stigma 1.5-2.5 mm long; disc undulate, 0.2-0.3 mm long. Pistillate flowers unknown. Fruit glabrous, subglobose, ca. 1.3-2 cm diam., the pedicel 1.5-4 mm long; seeds ellipsoid, flattened, 5-6 mm long, 3-4 mm wide, the testa brown, striate-sulcate.

Distribution. — Mexico, known only from Nayarit and Sinaloa in the foothills of the Sierra Madre Occidental (Fig. 3). The species is apparently rare and local, known only from a few collections, although further exploration in western Mexico may increase its known range.

Habitat. — It occurs from about 480 to 800 m, and was collected in *Quercus* forest in a rocky gully.

The sessile leaves with a dense, rufous abaxial pubescence and pubescent stems and inflorescence readily distinguish this species from *G. concinna*. Flowering material was collected in August, and fruits in August and December.

Specimens studied. — Mexico. Sinaloa: Cerro Colorado, 2500 ft, *H. S. Gentry 5117a* (MO); *H. S. Gentry 5117* (MEXU, MO); San Ignacio, C. del Aguajito Campanillas, 480 m, *González Ortega 573* (ENCB); *González Ortega 799* (MEXU).

2. *Glossostipula concinna* (Standley) D. Lorence, **comb. nov.** (Fig. 1b-k).

- *Randia concinna* Standley, Publ. Field Mus. Nat. Hist., Bot. Ser. 4: 288. 1929; Standley, Publ. Field Mus. Nat. Hist., Bot. Ser. 22: 282. 1940. Type: Mexico. Jalisco, San Sebastián, Hacienda del Ottotal, Sierra Madre Occidental, 1500 m, 15 Feb. 1937, *Y. Mexia 1690* (holotype: F!; isotypes: MO!, US!).
- *Genipa vulcanicola* Standley, Publ. Field Mus. Nat. Hist., Bot. Ser. 17: 213. 1937. Type: Guatemala. Suchitepéquez, Volcán de Atitlán, 7700 ft., 24 Oct. 1934, *A. F. Skutch 1512* (holotype: F!; isotype: US!).

Dioecious trees 3.5-15 m tall, the trunk to 30 cm diam., the young twigs glabrous, the mature twigs 1.5-5 mm diam., \pm terete, compressed or \pm quadrangular, the bark pale brown or gray, peeling, the underbark reddish, the nodes slightly dilated, the leaf scars prominent; stipules

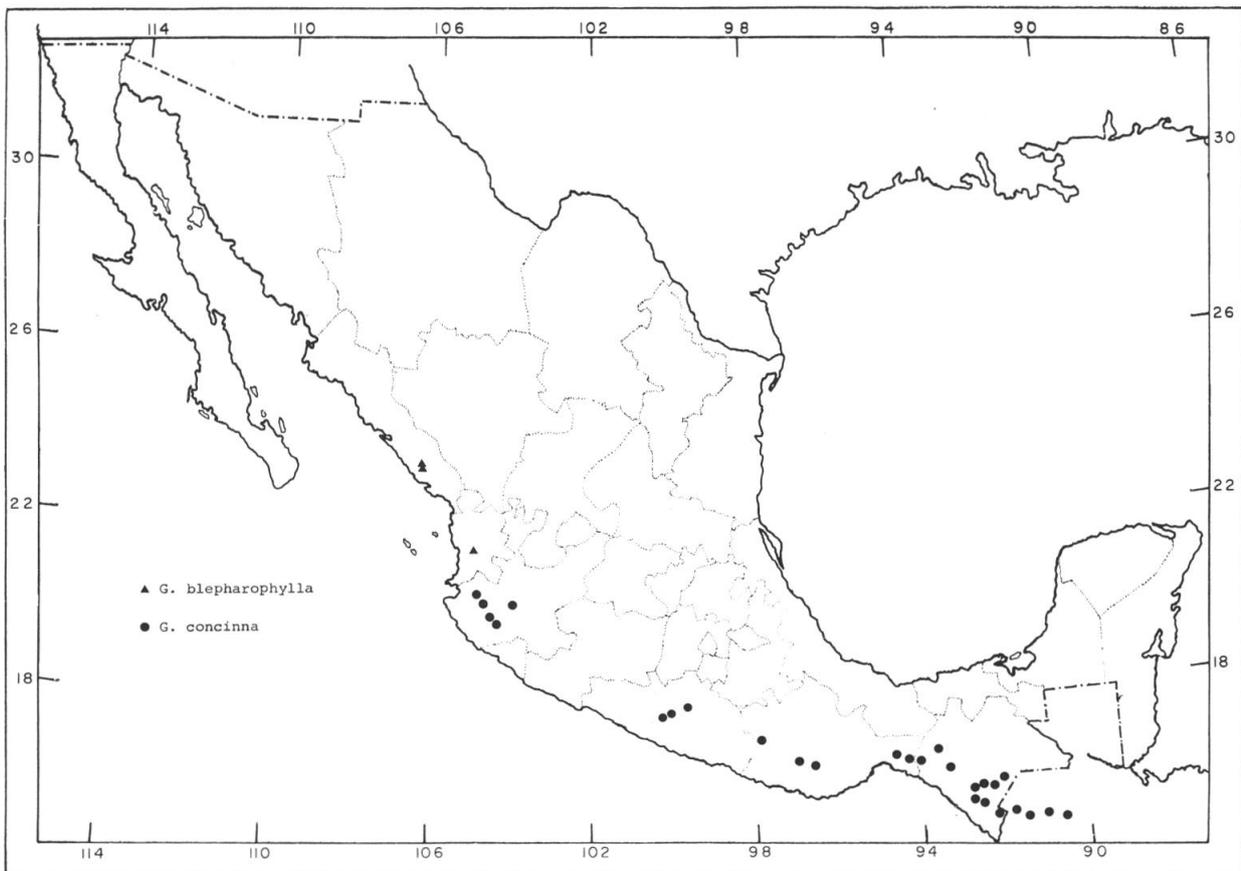


Fig. 3. — Distribution map of *Glossostipula* in Mexico and Guatemala.

linguiform, ovate to elliptic, (0.9-)1.3-4 cm long, (0.4-)0.6-2 cm wide, connate basally for 2-3 mm, drying greenish-brown, externally sparsely strigillose dorsally near the base, rarely the entire surface hirtellous, the trichomes whitish, 0.5-1 mm long, multicellular, the internal surface with brown digitate colleters basally, the stipule scar with a ring of colleters. Leaves petiolate; petioles (0.6-)1-2.5 cm long, 1-3 mm diam., glabrous, adaxially canaliculate, often narrowly winged; lamina elliptic, broadly elliptic, broadly ovate or rarely hirtellous, obovate-elliptic, (4-)7-19 cm long, (2-)3-13.5 cm wide, the apex obtuse, acute or shortly acuminate, the acumen to 5 mm long, the base rounded, obtuse, acute or attenuate, the sides subequal, often decurrent, the lamina slightly discolorous, subcoriaceous, drying greenish-brown, adaxially glabrous, lustrous, abaxially glabrous or both surfaces rarely hirtellous, the 2° veins 5-8 pairs, camptodromous or weakly festooned brochidodromous, the 2° vein axils usually domatiate and often also barbate, the venation visible to 4° on both surfaces, the margin thin, slightly revolute. Staminate inflorescence a thyrse 3-5 cm long, 4-7 cm wide, sessile, the axes glabrous except for tufts of hairs near the pedicels, the primary branches 3-5, these 1.5-3 cm long, the flowers 9-18, the pedicels 1-10 mm long, 0.5-1 mm diam., the hypanthium obconical, glabrous, 1-2 mm long and wide, the ovary abortive, the calycine cup 4-7 mm long, 5-8 mm wide, glabrous externally and internally, the margin scarious, dentate with 6 acute to truncate lobes 0.5-1.5 mm long, 0.8-2 mm wide, the apex entire or 2-3-denticulate; corolla white when fresh, drying blackish, 1.2-1.5 cm long in bud, the apex obtuse, at anthesis shortly hypocrateriform, the lobes 6, spreading, suborbicular to ligulate, 7-9 mm long, 5-9 mm wide, the apex obtuse, truncate or retuse, the margins erose, ciliolate, the tube 7-9 mm long, 3-5 mm wide medially, glabrous externally and internally, the anthers ovoid-ellipsoid, 4-5.5 mm long, 1-1.5 mm wide, the style hirtellous except distally, 1-1.2 cm long including the clavate 4-lobed stigma 3-4 mm long, the disc concave, undulate. Pistillate flowers solitary, terminal, subtended by a pair of stipule-like bracts, the pedicel 3-15(-25) mm long, 0.8 mm diam., glabrous, minutely bracteolate, articulate distally, the hypanthium subglobose, 6-8 mm long, 5-7 mm diam., glabrous or rarely hirtellous, the calycine cup cylindrical, 4-5 mm long, 5-6 mm diam., usually splitting along one side, glabrous externally and internally, the margin with 4-6 short, acute teeth 0.3-1 mm long, 0.4-1.5 mm wide, the apex entire or denticulate; corolla in bud 1.2 cm long, acute, the anthers 3-4 mm long, abortive, the style 1 cm long including the deeply 4-lobed, subglobose stigma 2-2.5 mm long, the disc concave, undulate; ovary 4-locular, the placentation axile, the placentas hemispherical, spongy, the ovules ellipsoid to reniform, vertical, 6-8 per locule. Fruits terminal, solitary, smooth, glabrous or rarely sparsely hirtellous, globose, 2.5-3.5 cm diam., crowned by the persistent calycine cup 2-4 mm long, drying blackish, 4-locular, the pericarp fleshy when fresh, 3-5 mm thick, the seeds 4-7 per locule, vertical, flat, ellipsoid to reniform, 6-12 mm long, 4-7 mm wide, 1-2 mm thick, the testa thin, brown, striate-sulcate, the exotesta cells fusiform, thin-walled, with medially thickened radial walls, the thickenings smooth, endotesta parenchyma-like, crushed, the endosperm abundant, the embryo erect, basal, spatulate, 1.5-2 mm long, the cotyledons appressed.

Distribution. — The species occurs in the Sierra Madre Occidental of Mexico from Jalisco to Oaxaca (no collections were seen from Michoacan), and in the Sierra Madre de Chiapas south into the mountains of Guatemala in the Department of Quezaltenango (Fig. 3).

Habitat. — It occurs from about 1250 to 2850 m altitude in montane rain or cloud forest, in Chiapas associated with *Pinus*, *Quercus*, *Liquidambar*, *Ulmus*, *Styrax*, *Weinmannia*, *Zinoweiwia*, *Sterculia*, *Clethra*, *Symplocus*, *Magnolia* and *Oecopetalum*. In Oaxaca, Guerrero and Jalisco it has been collected in *Pinus* and *Quercus* forest, often in zones transitional to somewhat drier semideciduous forest where associated with *Cupressus*, *Fraxinus*, *Prunus*, *Garrya*, *Cornus*, *Magnolia*, *Croton* and *Alchornea*. Flowering takes place from November through August in various parts of the range, and fruiting also occurs during most of the year.

Specimens studied. — Mexico. Jalisco: 9-10 km N. of La Cuesta, 1250 m, *McVaugh 23377* (ENCB); 15 km N. de La Cuesta, 1300 m, *Rzedowski 15168* (ENCB); Sierra de San Sebastián, 15-30 km N. of Mascota, 1450-1730 m, *Anderson 5960* (ENCB); Mpio. de Ayutla, La Platanillera, 11 km S.W. de Las Iglesias, 1850 m, *Guízar & Niembro 384* (MEXU). Guerrero: Mpio. de Chichihualco, 2120 m, 21 km después de Carrizal de Bravo, carretera Filo de Caballo-Atoyac, *Contreras & Lorenzo 1098* (FCME); Mpio. de Atoyac de Alvarez, 1 km S.W. de El Molote, 1650 m, *Lorea 2988* (FCME); Mpio. de Tlacotepec, Puerto de la Piedra Acanalada, aprox. 14 km S.W.

de Puerto de Gallo hacia Atoyac, *Laboratorio de Biogeografía 1120* (MEXU). Oaxaca: Mpio. de Juquila, 80 km S.-S.W. of Sola de Vega, and 30 km S. of Río Verde crossing at Juchatengo, 1450-1700 m, *McVaugh 22387* (ENCB); Dto. de Juchitán, Cerro Baúl a 23 km de Rizo de Oro, *Torres C. 4883A* (MEXU); *Torres C. 4883B* (MEXU); Dto. de Miahuatlán, 25.6 km al S.W. de San Jerónimo Coatlán, 1530 m, *Torres C. & al. 2240* (MEXU); Dto. de Putla, San Isidro a 15 km al N. de Putla, *Torres C. & al. 6754* (MEXU); Sierra Madre, N. of Zanatepec, 5000 ft., *MacDougall s. n. in 24-29 March 1964* (MEXU). Chiapas: Mpio. Angel Albino Corozo, above Finca Cuxtepec, 1380 m, *Breedlove 48689* (MEXU); Mpio. of Cintalapa, S.E. of Cerro Baúl, 16 km N.W. Rizo de Oro, 1600 M, *Breedlove 21819* (MEXU); *Breedlove 24777* (MEXU); *Breedlove 31366* (MEXU); Cerro Baúl, 3 km E. Colonia Rudolfo Figerosa, 1550 M, *Croat 47665* (MEXU); Finca Prusia por camino a Mapastepec, Triunfo, *Miranda 7017* (MEXU); El Triunfo, 6100 ft., *Andrele 497* (INIF); Triunfo, Jalapa, Escuintla, *Matuda 18440* (MEXU); Mt. Ovando, 1800 m, *Matuda 433* (F, MEXU); *Matuda 1566* (MEXU); *Matuda 2081* (F, MEXU); *Matuda 17732* (MEXU); Mpio. Motozintla de Mendoza, Cerro Mozotal, 2100 m, *Breedlove 25735* (MEXU); *Breedlove 41716* (MEXU); Rancho Ocote, 30 km N.O. de Ocozocuatla, *Miranda 6322* (MEXU); Mpio. de Siltepec, Siltepec, 2000-2400 m, *Matuda 1633* (F, MEXU); *Breedlove 55943* (MEXU); Pinabeto, Motozintla, 2585 m, *Matuda 5439* (MEXU); Mpio. Villa Corzo, Cerro Trés Picos near Cerro Bola, 1500 m, *Breedlove 30080* (MEXU); Volcán Tacaná, cerca Chiquihuites, 1920 m, *Hernández M. 909* (MEXU); Mt. Pasitar, *Matuda S-218* (F). **Guatemala.** Department of Quezaltenango, near Aguas Amargas, Volcán de Zunil, 2430-2850 m, *Standley 65405* (F); Los Positos, S.E. of San Martín Chile Verde, 1500 m, *Standley 67918* (F); near Santa María de Jesús, 1400 m, *Steyermark 34411* (F).

Vernacular name: "Manzanillo" (Chiapas).

Glossostipula concinna is readily distinguished from *G. blepharophylla* by its petiolate, usually domatiate leaves and nearly glabrous parts. Two collections from Guerrero, *Lorea 2988* and *Laboratorio de Biogeografía 1120*, differ in having a conspicuous fulvous, hirtellous pubescence on the stems and petioles, externally hirtellous stipules, and leaves with few or no domatia in the secondary vein axils. Pistillate material has sparsely hirtellous young fruits with longer (20-25 mm) pedicels, but the female flowers are otherwise identical with *G. concinna*. These seem to merely represent pubescent forms of *G. concinna*, and I have decided not to accord them formal taxonomic recognition, as the typical glabrous form of the species was collected along the same road in Guerrero at a lower altitude (*Contreras & Lorenzo 1098*).

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