

Synopsis of *Dicliptera* (Acanthaceae) in the Nueva Galicia Region of Western Mexico with a New Species, *D. novogaliciana*

Thomas F. Daniel

Department of Botany, California Academy of Sciences, 55 Music Concourse Drive, Golden Gate Park, San Francisco, CA 94118 U.S.A.; Email: tdaniel@calacademy.org

This account of *Dicliptera* in the Nueva Galicia region of western Mexico includes an introduction to the genus, a key to and descriptions of the eight species known from the region, distributional and ecologic data for each taxon, and illustrations of most taxa. A new species, *D. novogaliciana*, is described and is endemic to western Nueva Galicia. Two names, *D. nervata* and *D. pringlei*, are lectotypified. The eight species treated are: *D. haenkeana*, *D. inaequalis*, *D. membranacea*, *D. nervata*, *D. novogaliciana*, *D. peduncularis*, *D. resupinata*, and *D. thlaspioides*.

Esta cuenta de *Dicliptera* en la región de Nueva Galicia de México occidental incluye una introducción al género, una clave a y las descripciones de las ocho especies sabidas de la región, los datos distribucionales y ecológicos para cada especie, y las ilustraciones para la mayoría de las especies. Una nueva especie, *D. novogaliciana*, se describe y es endémica a la porción occidental de Nueva Galicia. Las lectotipificaciones se hacen para dos nombres, *D. nervata* y *D. pringlei*. Las ocho especies tratadas son: *D. haenkeana*, *D. inaequalis*, *D. membranacea*, *D. nervata*, *D. novogaliciana*, *D. peduncularis*, *D. resupinata*, y *D. thlaspioides*.

Dicliptera consists of about 175 species occurring in temperate and tropical regions of both the Old World and the New World. The genus has not been revised in its entirety in more than 150 years and is in need of critical taxonomic study. Mexico appears to be a regional center of diversity and endemism for *Dicliptera*. Mexican plants vary from annual herbs to large shrubs and have flowers that vary widely in size, color, and resupination. Of the approximately 75 New World species, 15 occur in Mexico, and at least eight of those are endemic to the country (Daniel, unpublished).

The Nueva Galicia region of western Mexico (Fig. 1A), as delimited by Rzedowski and McVaugh (1966) and McVaugh (1983) for the Flora Novo-Galiciana project, is recognized as a floristically rich region of the country (e.g., Graham 1993; Toledo et al. 1997). Indeed, at least 105 species of Acanthaceae occur there (Daniel 1993). Eight species of *Dicliptera* have been collected in Nueva Galicia, including one newly described below that is endemic to the region.

Based on both morphological and molecular characteristics, *Dicliptera* is included in subfamily Acanthoideae, tribe Justiceae, and subtribe Diclipterinae (McDade et al. 2000). Within the subtribe, *Dicliptera* is part of a monophyletic lineage that also includes the Old World genera *Hypoestes* Sol. ex R. Br. and *Peristrophe* Nees, all of which are characterized by resupinate corollas. Floral resupination is achieved in all three genera by a twisting, usually 180°, of the corolla tube. In some *Dicliptera*, especially in the New World, there is no torsion in the corolla tube (i.e., resupination has been lost), and in other species the corolla is resupinate 360°. In both of these lat-

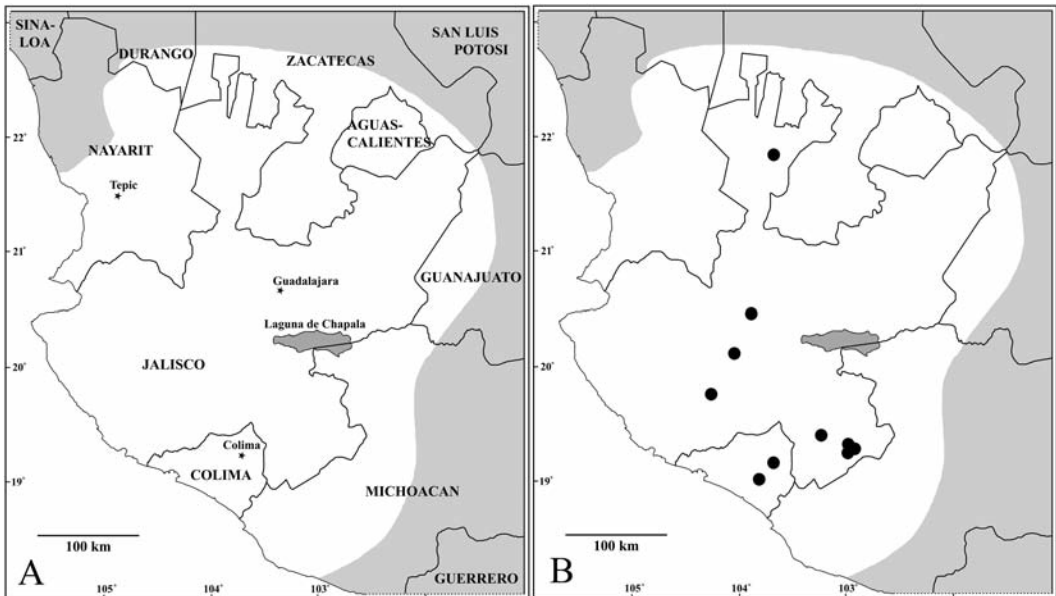


FIGURE 1. A. Map of west-central Mexico showing the boundaries of the Nueva Galicia region as delimited for the *Flora Novo-Galiciana*. B. Distribution of *Dicliptera haenkeana* in Nueva Galicia.

ter conditions, orientation of the lips of the limb is identical (i.e., upper lip entire or 2-lobed and lower lip 3-lobed). Among species of *Dicliptera* in Nueva Galicia, all three conditions are encountered: non-resupinate, resupinate 180°, and resupinate 360° (Fig. 2). All species are constant with respect to floral orientation except for *D. inaequalis*, which as circumscribed here exhibits non-resupinate corollas on some individuals and corollas that are resupinate 360° on others. Among Mexican *Dicliptera*, as exemplified by species from Nueva Galicia, small and white to pinkish (often with colored markings) corollas are resupinate 180°, whereas longer and red to orange to yellow (lacking markings) corollas are either not resupinate or resupinate 360°. Daniel and McDade (2005) noted that floral orientation, corolla size and color, and nectar sugar chemistry correlate with floral visitors among Mexican *Dicliptera*.

Pollen of *Dicliptera* in the New World is remarkably consistent (3-colporate, 6-pseudocolpate, interapertural surfaces reticulate) and offers no documented characteristics for distinguishing infrageneric taxa. This type of pollen is widespread among genera of Justiceaeae, including other Diclipterinae. Representative pollen grains for the eight species occurring in the Nueva Galicia region are shown in Figure 3.

Chromosome numbers have been determined for 25 species of *Dicliptera*, 15 of them restricted in distribution to the New World and 10 endemic to the Old World. All species from the New World have $n = 40$ (undoubtedly a derived number), whereas species from the Old World exhibit a diversity of numbers: $n = 10, 13, 15, 24, 26$ and ca. 30 (with $n = 13$ most commonly reported but with $n = 15$ known from taxa in Africa, Madagascar, and India [Daniel 2006; Daniel et al. 2000]). Chromosome numbers ($n = 40$) have been reported for five of the eight species occurring in the Nueva Galicia region (*D. haenkeana*, *D. inaequalis*, *D. nervata*, *D. peduncularis*, and *D. resupinata* [Daniel et al. 1984, 1990]).



FIGURE 2. Flowers of *Dicliptera* spp. in Nueva Galicia. A. *D. haenkeana* (Daniel & Butterwick 3275), resupinate 180°. B. *D. novogaliciana* (Daniel 2106), not resupinate. C. *D. nervata* (Daniel et al. 6282), resupinate 180°. D. *D. thlaspioides* (Daniel 1292 from Oaxaca), resupinate 180°. E. *D. inaequalis* (cultivated plant of Daniel et al. 6267), resupinate 360°. F. *D. resupinata* (cultivated plant at Tucson Botanical Garden, Arizona), resupinate 180°.

***Dicliptera* Juss., Ann. Mus. Natl. Hist. Nat. 9:267. 1807, nomen conserv.**TYPE.—*Dicliptera chinensis* (L.) Juss. (≡*Justicia chinensis* L.).

Herbs or shrubs with cystoliths; young stems ± distinctly 6-angled in cross-section. Leaves opposite, petiolate, margin entire to subsinuate. Inflorescence of axillary cymes (= modified dichasia ?) bearing 1 or more bracteolate cymules; cymes alternate or opposite, subtended by paired bracts, sessile or pedunculate in leaf axils or in axils of inflorescence bracts forming a terminal spikelike thyrses or panicle of thyrses; cymules sessile or pedunculate, comprising an involucre of several pairs of bracteoles, outermost pair usually conspicuous and larger than inner (often hyaline) pair(s), cymule bracteoles of a pair equal or unequal in size. Flowers 1–several per cymule, sessile. Calyx deeply 5-lobed, usually reduced and hyaline, lobes equal to subequal. Corolla often resupinate (i.e., tube twisted 180° or 360°), pink to purple, red, orange, yellow, whitish, or blue, often with colored markings on lips, tube cylindrical to gradually expanded distally but usually lacking a distinct throat, limb bilabiate, upper (dorsal) lip entire to emarginate, lower (ventral) lip entire to shallowly 3-lobed (position of lips reversed when corolla resupinate 180°), corolla lobes imbricate (ascending-cochlear) in bud. Stamens 2, inserted in proximal or distal ½ of corolla tube, exerted from mouth of corolla or rarely included in corolla tube, anthers 2-theous, thecae equal to subequal in size, parallel to perpendicular, inserted at same or at different positions on filament, usually lacking basal appendages (rarely with lower theca minutely appendaged at base), dehiscing toward lower lip (i.e., flower nototribal) in species with corollas either not resupinate or resupinate 360°, dehiscing toward upper lip (i.e., flower stenotribal) in species with corollas resupinate 180°; pollen perprolate to prolate, 3-colporate, 6-pseudocolpate, pseudocolpi 2 per mesocolpium, exine reticulate; staminodes 0. Style exerted from mouth of corolla or rarely included in corolla tube, stigma 2-lobed, lobes equal. Capsule substipitate to stipitate, head ellipsoid to obovoid, retinacula present, septa with attached retinacula separating elastically and rising from inner wall of mature capsule. Seeds 2–4, homomorphic, lenticular. ($x = 40$ in New World taxa; $x = 15$ in Old World taxa)

Data in the key to and descriptions of species below are based solely on specimens from the Nueva Galicia region.

Key to *Dicliptera* in Nueva Galicia

1. Corolla 25–45 mm long, not resupinate or resupinate 360° (i.e., in some individuals of *D. inaequalis*; in either case with upper lip entire to 2-lobed and lower lip 3-lobed); thecae 1–1.6 mm long; capsule 7–9 mm long.
 2. Corolla externally pubescent with at least some glandular trichomes, lips 8–13 mm long; outer cymule bracteoles linear to lance-subulate to lanceolate to oblanceolate to obovate to hour-glass shaped, 1–6 mm wide, often glandular; inner cymule bracteoles usually glandular; plants of inland regions at 500–2000 m elevation. *D. inaequalis*
 2. Corolla externally pubescent with eglandular trichomes only, lips 12–19 mm long; outer cymule bracteoles deltate to ovate, 6–20 mm wide, eglandular; inner cymule bracteoles eglandular; plants of near coastal regions at 9–100 m elevation. *D. novogaliciana*
1. Corolla 8–21 mm long, resupinate 180° (i.e., upper lip 3-lobed and lower lip entire to 2-lobed); thecae 0.5–1 mm long; capsule 4–8 mm long.
 3. Outer cymule bracteoles reniform to cordate to deltate; inner cymule bracteoles 1.3–2.5 mm long; calyx 1.5–2.5 mm long *D. resupinata*
 3. Outer cymule bracteoles linear to ovate to elliptic to circular to hour-glass shaped to oblanceolate to widely obovate; inner cymule bracteoles 3–7 mm long; calyx 3–6 mm long.

4. Bracts subtending cymes 4–8 mm long, 1.5–2.5 mm wide; outer cymule bracteoles (adaxial surface only), inner cymule bracteoles, calyx, and corolla glandular *D. membranacea*
4. Bracts subtending cymes 1–3 mm long, 0.2–1 mm wide; outer cymule bracteoles, inner cymule bracteoles, calyx, and corolla eglandular
5. Cymes sessile (or if subsessile, the peduncles to 3 mm long); filaments pubescent; corolla 8–12 (–15.5) mm long
6. Cymes partially expanded (i.e., at least some cymules borne on peduncles more than 10 mm long); capsule (in ours) glabrous (or rarely sparsely pubescent near apex in *D. haenkeana*)
7. Outer cymule bracteoles equal in size, linear-lanceolate to linear to elliptic to subcircular to obovate to oblanceolate *D. haenkeana*
7. Outer cymule bracteoles conspicuously unequal in size, linear to linear-lanceolate to oblanceolate to hour-glass shaped *D. peduncularis*
6. Cymes contracted (i.e., all cymules sessile or rarely borne on peduncles to 1 mm long); capsule usually pubescent *D. nervata*
5. Cymes pedunculate, peduncles (3–) 15–25 mm long; filaments glabrous; corolla 14–18 mm long *D. thlaspioides*

***Dicliptera haenkeana* Nees in A. de Candolle, Prodr. 11:487. 1847.**

Diapedium haenkeanum (Nees) Kuntze, Revis. Gen. Pl. 2:485. 1891.

TYPE.— MEXICO. State Unknown: without locality or date, T. Haenke s.n. (holotype: K ex hb. Hooker; possible isotypes [i.e., Haenke 986 collected in Mexico in 1791]: PR! PRC!).

Dicliptera rigidissima Miranda, Anal. Inst. Biol. Univ. Nac. México 15:30. 1944.

TYPE.— MEXICO. **Puebla:** Cerro de la Cruz, cerca de Raboso, Matamoros, 5 Oct 1942, *F. Miranda 2310* (holotype: MEXU!).

Annual or perennial herbs to 1.5 m tall; cymes sessile to subsessile (peduncles to 1 mm long) from axils of leaves (distal leaves sometimes reduced in size); cymules sessile to pedunculate (at least some distinctly pedunculate on each plant, peduncles to 55 mm long); outer cymule bracteoles linear-lanceolate to linear to elliptic to subcircular to obovate to oblanceolate, 1–5.5 mm wide, those of a pair equal in size; corolla resupinate 180°, pinkish (usually with darker reddish pink spots on lips), 8–12 mm long, externally eglandular; capsule 5–7 mm long, glabrous or sparsely pubescent near apex.

ILLUSTRATION.— Miranda (1944:31).

PHENOLOGY.— Flowering: October–March; fruiting: October–March.

DISTRIBUTION AND HABITAT.— Endemic to Mexico (Colima, Guerrero, Jalisco, México, Michoacán, Morelos, Puebla, Zacatecas); plants in Nueva Galicia occur (often along watercourses) in thornscrub, tropical deciduous forests, tropical subdeciduous forests, riparian forests, and disturbed areas (e.g., agricultural lands, roadsides) at elevations of 200–1410 m (Fig. 1B).

Dicliptera haenkeana appears to differ from *D. peduncularis* primarily by its paired outer cymule bracteoles that are equal (vs. conspicuously unequal) in size. The shape of the outer cymule bracteoles varies from linear-lanceolate to linear to subcircular to oblanceolate to obovate. Two collections with conspicuously differently shaped bracteoles were collected at the same locality: broadly elliptic to subcircular to obovate (*Anderson & Anderson 6156*) and linear to narrowly elliptic to oblanceolate (*Anderson & Anderson 6155*).

NUEVA GALICIA SPECIMENS EXAMINED.— **Colima:** Microondas La Cumbre, 1.9 km E of Río Salado on Hwy. 110 SE of Colima, *T. Daniel* 5290 (CAS); Mpio. Colima, Valley del Río Salado, 5–7 km E de Colima por carr. a Pihuamo, *S. Koch et al.* 89160 (CAS, MICH); Mpio. Tecomán, Tecolapa, Cerro La Salada, *F. Leger CUIDA1070* (CAS). **Jalisco:** ca. 10 km N of Juchitlán toward Guadalajara, *W. Anderson & C. Anderson* 6155 (MICH), 6156 (MICH); along road between Tepalcatepec and Tecalitlán, 18.4 mi SE of Jilotlán, *T. Daniel & M. Butterwick* 3275 (ASU, CAS, MEXU, MO); Mpio. Tecalitlán, road from Sierra de los Corales to Tepalcatepec, *J. Dieterle* 3053 (MICH); Mpio. San Martín Hidalgo, Sierra de Quila, 200 m SO de Río Grande, *J. Guerrero N.* 494 (MICH); Mpio. Autlán, 10.7 km N de Autlán, carr. Autlán–El Grullo, *E. Lott & P. Davila* 2722 (CAS, RSA); Mpio. Villa Guerrero, 41 km SW de Villa Guerrero, camino a Chimaltitlán, *E. Lott et al.* 2021 (CAS); 3–12 km E and SE of Jilotlán de los Dolores, *R. McVaugh* 24634 (MICH); Mpio. Jilotlán de los Dolores, 20 km SE of Jilotlán de los Dolores toward Tepalcatepec, ca. 19°18'18"N, 102°54'34"W, *V. Steinmann & Y. Ramírez A.* 4757 (RSA).

***Dicliptera inaequalis* Greenm., Proc. Amer. Acad. Arts 39(5):90. 1903, as “*inaequalis*.”**

TYPE.— MEXICO. **Morelos:** Cuautla, near Cuernavaca, 1250 m, 30 May 1901, *C. Pringle* 9665 (holotype: GH; isotype: US!).

Dicliptera aquatica Leonard, Kew Bull. 1938:70. 1938.

TYPE.— MEXICO. **México:** Distr. Temascaltepec, San Lucas del Maíz, 4 Feb 1933, *G. Hinton* 3337 (holotype: K! isotypes: F! MEXU! US!).

Perennial herbs or shrubs to 3.5 m tall, infrequently epiphytic; cymes sessile to pedunculate (peduncles to 90 mm long) from leaf axils or from axils of bracts in spicate to subspicate axes; cymules sessile or pedunculate (peduncles to 25 mm long); outer cymule bracteoles linear to lance-subulate to lanceolate to elliptic to oblanceolate to obovate to hour-glass shaped, 1–6 mm wide, those of a pair subequal to unequal in size; corollas not resupinate or resupinate 360°, red, maroon, salmon, pinkish, orangish, or yellow, 25–40 mm long, externally glandular; capsule 7–9 mm long, pubescent.

ILLUSTRATION.— None found.

PHENOLOGY.— Flowering: November–June; fruiting: February–June.

DISTRIBUTION AND HABITATS.— Endemic to Mexico (Colima, Guerrero, Jalisco, Michoacán, Morelos, Nayarit, Querétaro, Zacatecas); plants in Nueva Galicia occur (especially along water-courses) in disturbed situations (e.g., roadsides), tropical deciduous forests, tropical subdeciduous forests, oak forests, mesophytic montane forests, and pine forests at elevations of 500–2000 m (Fig. 4A).

Daniel and Acosta C. (2003) provided a comprehensive description of this species from the Bajío Region of central Mexico. It superficially resembles *D. sciadephora* Donn. Sm. from southern Mexico and Central America (*cf.* Daniel 1995), but that species has generally more open inflorescences (with peduncles of cymes to 105 mm long and peduncles of cymules to 73 mm long), longer (9–11 mm) capsules, seeds bearing elongate papillae with retrorse barbs (vs. rounded papillae lacking retrorse barbs), and non-resupinate corollas. Plants of *D. inaequalis* in the Nueva Galicia region comprise a rather heterogeneous assemblage with respect to pubescence, contraction vs. expansion of the inflorescence, size and shape of the outer cymule bracteoles, corolla color, insertion of the anther thecae (subequally inserted to superposed), and capsular pubescence (only eglandular or with both glandular and eglandular trichomes). Remarkably, both plants with non-resupinate corollas (e.g., *Daniel & Bartholomew* 4809, *Flores F. & Ramirez R.* 2595, *Webster* 1077) as well as those bearing corollas with a 360° twist in the tube (e.g., *Daniel & Bartholomew* 4860, *Lott et al.* 977, *McVaugh* 25728, *Ornelas U. & García C.* 1589, *Soto N.* 8193, *Villa C. & Chávez L.* 627) are represented among collections of this species. In both floral presentations, the

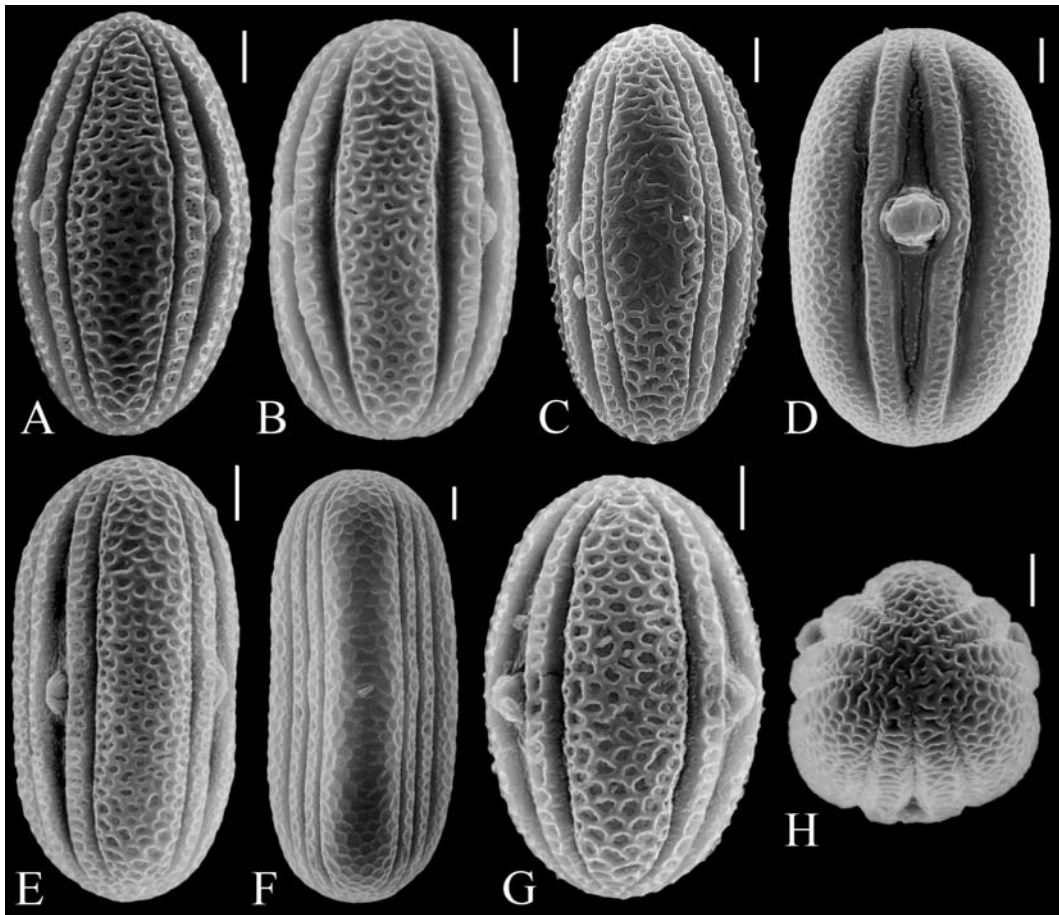


FIGURE 3. Pollen of *Dicliptera* in Nueva Galicia. A. *D. thlaspioides* (Breedlove 35983), interapertural view. B. *D. nervata* (Daniel 4009), interapertural view. C. *D. membranacea* (Anderson & Anderson 5984), interapertural view. D. *D. inaequalis* (Daniel & Bartholomew 4860), apertural view. E. *D. peduncularis* (Daniel 1262 from Oaxaca), interapertural view. F. *D. novogaliciana* (Daniel & Bartholomew 4877), interapertural view. G. *D. haenkeana* (Daniel 5290), interapertural view. H. *D. resupinata* (Daniel 6865 from Baja California Sur), polar view. All scales = 5 μ m.

lower lip is 3-lobed (Fig. 2E). No correlations are evident between either corolla color or geography and resupination in *D. inaequalis*. So far as is known, this is the only species of *Dicliptera* with both non-resupinate and resupinate corollas. Whether the various morphological forms currently recognized as constituting this species complex should be treated as distinct taxa deserves additional study. Extreme forms of the species appear superficially very different from one another.

NUEVA GALICIA SPECIMENS EXAMINED.— **Colima:** Mpio. Comala, Rancho El Jabalí, ca. 1.5 km E of Hacienda San Antonio, vic. of Lagos Calabozo and Epazote, 19°26'N, 103°40.5'W, *T. Daniel et al.* 6267 (CAS); Mpio. Comala, 20 km NE de Comala, carr. a San Antonio, altar de la Virgen de Guadalupe, *E. Lott & A. Solís M.* 340 (CAS); Mpio. Comala, Rancho El Jabalí, 22 km (air) NNW of Colima, near Hac. San Antonio on hwy. to Comala, ca. 19°27'N, 103°43'W, *A. Sanders et al.* 10680 (CAS, RSA); Mpio. Comala, Rancho El Jabalí, 22 km (air) NNW of Colima, road to Lago Epazote, ca. 19°27'N, 103°42.5'W, *L. Vazquez V. & B. Phillips* 615 (CAS). **Jalisco:** Mpio. Tecalitlán, Sierra del Alo, cerca de San Isidro a lo largo de la brecha que va a Jilotlán de los Dolores, *M. Cházaro B. et al.* 4577 (IBUG); 20.9 mi NE of La Huerta and 14.7 mi SW of turn to Ahuacapan S of Autlán on Hwy. 880, *T. Daniel* 2117 (ASU, CAS, MEXU), 2120 (CAS); between

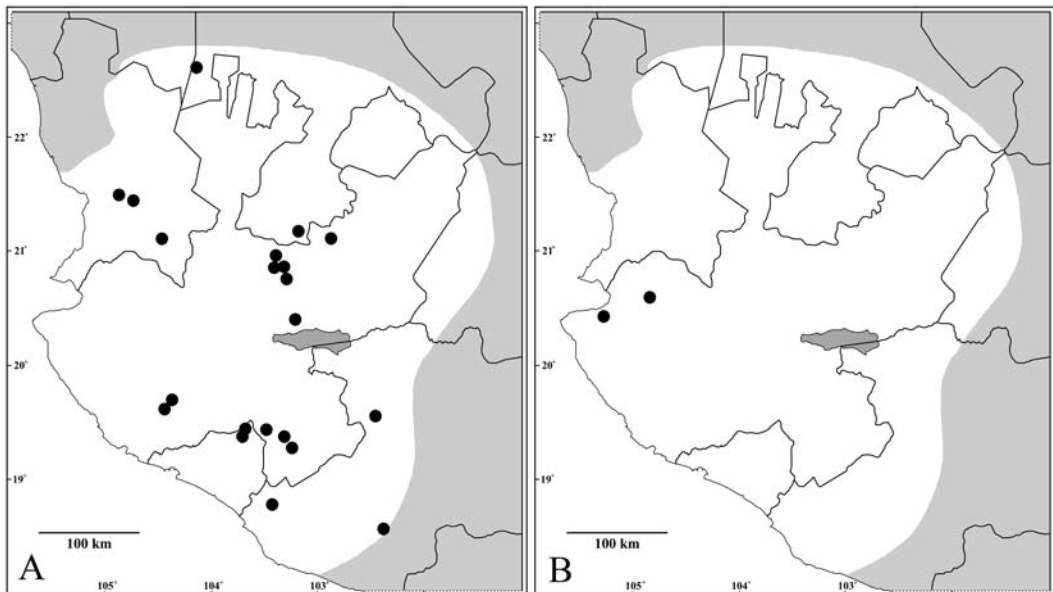


FIGURE 4. A. Distribution of *Dichiptera inaequalis* in Nueva Galicia. B. Distribution of *D. membranacea* in Nueva Galicia.

Tesistán and San Cristóbal de la Barranca, 10.6 mi S of bridge over Río Santiago, *T. Daniel & B. Bartholomew 4809* (CAS, MICH, MO); between Autlán and La Huerta, ca. 2.1 mi S of summit of pass (Puerto Los Mazos), *T. Daniel & B. Bartholomew 4860* (CAS, MICH, MO); Mpio. Casimiro Castillo, El Tigre, 6–7 km N de Casimiro Castillo, 12–13 km SSW de Autlán, 19°40'N, 104°26'W, *L. Guzmán & G. López 726* (IBUG); La Barranca, *M. Jones 23150* (CAS, MO); Mpio. Tonila, 21.2 km SW de Atenquique, carr. Tonila-Atenquique, *E. Lott et al. 977* (CAS, MICH, MO); Mpio. Autlán, 10.5 km S de Autlán, *R. Ornelas U. & J. García C. 1589* (MICH); Guadalajara, *C. Pringle S-884* (GH); mountains near Lake Chapala and Guadalajara, *C. Pringle 5344* (GH, MEXU, US); Guadalajara, *B. Reko 4602* (US); Mpio. Casimiro Castillo, 10–11 km NNE de Casimiro Castillo, 10–11 km SSW de Autlán, 19°41.5'N, 104°25'W, *E. Sánchez & L. Guzmán 15* (IBUG); Mpio. Tecalitlán, 14 km SE de Llanitos, brecha a Canutillo, *J. Villa C. & J. Chávez L. 627* (CAS, MICH); Mpio. de Zapopán, Nacimiento del Río Atlicolte en arroyos de Copala, *L. Villarreal 4903* (IBUG); Mpio. Zapopán, Arroyo de las Milpillars, carretera a San Cristóbal de la Barranca, *L. Villarreal de Puga 7314* (IBUG); Mpio. de Yahualica, NE de Cuquio, *L. Villarreal de Puga & S. Carvajal H. 10349* (ENCB, IBUG). **Michoacán:** Mpio. Los Reyes, 1.5 km SE de Los Reyes, *S. Carvajal H. & A. Moreno C. 895* (IBUG); along road from Caramicus to Tumbiscatio, 12.6 km N of Tumbiscatio, 18°35.024'N, 102°20.717'W, *J. Porter & V. Steinmann 14592* (RSA); Mpio. Chinicuila, camino Villa Victoria–Palos Marias, *J. Soto N. et al. 8193* (BIGU, CAS). **Nayarit:** Mpio. Ahuacatlán, 8 km W de Jala, camino a la estación de microondas, Volcán El Ceboruco, 21°05'N, 104°30'W, *G. Flores F. & R. Ramirez R. 2595* (CAS); Mpio. Jala, Volcán El Ceboruco, 12 km NE de Jalpan, 21°07'N, 104°30'W, *G. Flores F. & R. Ruenes 1884* (CAS, MICH); Tepic, *E. Palmer 2001* (US); Cerro Sanganguey, cerca de Tepic, *L. Paray 2707* (ENCB); KM 9 del camino de Jala a la estación de microondas (Volcán El Ceboruco), 21°07'N, 104°30'W, *O. Téllez V. & P. Magaña 8217* (CAS). **Zacatecas:** foothills of Sierra de los Huicholes, 12–18 km SW of San Juan Capistrano, and 20–25 km SW of crossing of Río Atenco (Chapalagana), *R. McVaugh 25728* (MICH); 8 mi S of Moyahua, *J. Webster 1077* (MICH).

***Dicliptera membranacea* Leonard, J. Wash. Acad. Sci. 31:102. 1941.**

TYPE.—GUATEMALA. **Escuintla:** between Río Jute and Río Pantaleón on road between Escuintla and Santa Lucía Cotz, 540–720 m, 24 Jan 1939, *P. Standley 63524* (holotype: US! isotype: F!).

Perennial herbs to 5 dm tall; cymes sessile to subsessile (peduncles to 2 mm long) from axils

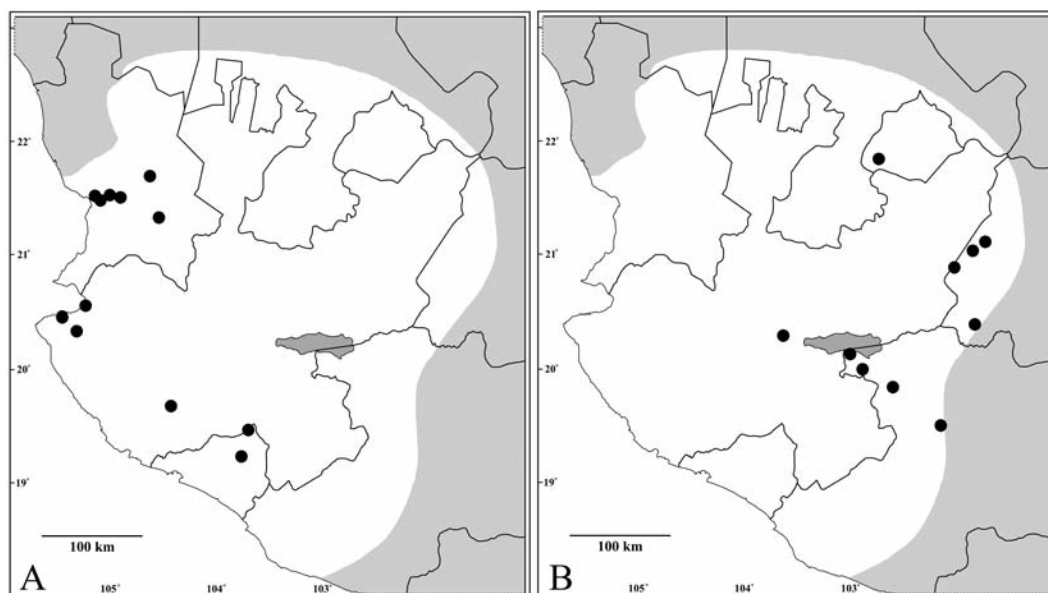


FIGURE 5. A. Distribution of *Dicliptera nervata* in Nueva Galicia. B. Distribution of *D. peduncularis* in Nueva Galicia.

of distal leaves and bracts (often forming a dense terminal spikelike thyse); cymules sessile; outer cymule bracteoles obovate, 1.8–4 mm wide, those of a pair subequal to unequal in size, often whitish proximally and dark green or purplish distally; corolla resupinate 180°, rose-purple and cream, 10–11 mm long, externally glandular (glandular trichomes sometimes sparse); capsule 4.5 long, pubescent.

ILLUSTRATION.— Leonard (1941:103).

PHENOLOGY.— Flowering: December–May; fruiting: December.

DISTRIBUTION AND HABITAT.— Mexico (Chiapas, Guerrero, Jalisco) and Guatemala; plants from Nueva Galicia occur in tropical subdeciduous forest, and moist shady mixed forest of *Magnolia*, *Fraxinus*, *Prunus*, *Garrya*, *Cornus*, etc. at elevations of 50–1200 m (Fig. 4B).

Daniel (1995) provided a comprehensive description of this species in Chiapas. Considerable variation with respect to the size of outer cymule bracteoles and corollas is evident among specimens identified as *D. membranacea* from throughout its range. Plants from the Nueva Galicia region have smaller bracteoles and corollas than the type from Guatemala.

NUEVA GALICIA SPECIMENS EXAMINED.— **Jalisco:** Sierra de San Sebastián, 15–30 km (air) N of Mascota on road to San Sebastián, *W. Anderson & C. Anderson 5984* (MICH); Mpio. Pto. Vallarta, carr. Pto. Vallarta–Tomatlán, 38 km de Pto. Vallarta, *Nieves et al. 27* (IBUG).

***Dicliptera nervata* Greenm., Proc. Amer. Acad. Arts 39:90. 1903.**

TYPE.— MEXICO. **Morelos:** Cuantla, near Cuernavaca, 1230 m, 31 May 1901, *C. Pringle 9664* (lectotype, designated here: GH! isolectotypes: K, MEXU! MO! NY, US!).

Perennial herbs to 3.5 dm tall; cymes sessile or subsessile (peduncles to 3 mm long), often clustered at nodes; cymules sessile to subsessile (peduncles to 1 mm long); outer cymule bracteoles ovate to widely obovate, 3–9.5 mm wide, those of a pair equal to unequal in size; corolla resupinate 180°, white to pink to pinkish purple, 9–12 (–15.5) mm long, externally eglandular; capsule 5–6 mm long, pubescent (rarely nearly glabrous on plants occurring near Puerto Vallarta).

ILLUSTRATION.— None found.

PHENOLOGY.— Flowering: November–May; fruiting: November–May.

DISTRIBUTION AND HABITAT.— Endemic to Mexico (Colima, Jalisco, Morelos, Nayarit, Sinaloa); plants from Nueva Galicia occur in tropical subdeciduous forests, oak forests, mesophytic montane forests, pine forests, and disturbed areas (e.g., roadsides, cafetales) at elevations from near sea level to 1300 m (Fig. 5A).

In the protologue Greenman (1903) cited two syntypes, the Pringle collection designated above as lectotype, and *Bilimek 344* (syntype: GH!) from Cuernavaca in Morelos (collected 8 January 1866).

NEUE GALICIA SPECIMENS EXAMINED.— **Colima:** Mpio. Comala, Rancho El Jabalí, ca. 1.5 km E of Hacienda San Antonio, ca. 19°26'N, 103°41'W, *T. Daniel et al. 6282* (CAS, IBUG, K, MEXU, MICH, MO, NY, US); Mpio. Colima, Hacienda Albaradita, 1 km W of Cd. Colima, *C. Gilly et al. 62* (MICH); Rancho El Jabalí, 22 km (air) NNW of Colima in SW foothills of Volcán de Colima, ca. 19°26.7'N, 103°41.9'W, *A. Sanders et al. 11074* (MO, US). **Jalisco:** Hwy. 80 between Autlán and La Huerta, 8.7 mi S of turn to Ahuacapan, *T. Daniel & B. Bartholomew 4863* (CAS, MICH); ca. 2 km S of Pto. Vallarta, *C. Feddema 2503* (MICH); Mpio. Puerto Vallarta, entre El Jorullo y El Hundido, *R. González T. 597* (MICH); Mpio. Cabo Corrientes, 5 km N of El Tuito, *R. McVaugh 23500* (MICH); S of Pto. Vallarta, *Y. Mexia 1110* (CAS, DS, MICH, MO, US); Yelapa, Ensenada Yelapa, Río Tuito, 20°29'N, 105°27'W, *T. Van Devender & R. Van Devender 94-12* (CAS). **Nayarit:** Mpio. Nayar, Colorado de la Mora, Arroyo de Los Negros, 150 m NW del poblado, *O. Bravo-Bolaños 2183* (MICH); Rte. 28, KM 20–21, *T. Croat 45293* (MO); along Rte. 28, 1.8 mi W of Jalcocotán between Tepic and Santa Cruz, *T. Croat 45318* (CAS, MO); between Tepic and Santa Cruz, 1.5 mi W of El Izote and 12.7 mi E of Jalcocotán, *T. Daniel 2029* (ASU, CAS, IBUG, MEXU); above La Bajada (near La Palma), ca. 12 mi (air) SE of San Blas, *T. Daniel 4009* (ASU, CAS); Hwy. 66 from Tepic to Miramar, 1.8 mi E of turn to Mecatán, *T. Daniel & B. Bartholomew 4732* (CAS, MICH); Hwy. 66 from Tepic to Miramar, 17.1 mi NE of Tecuitata, *T. Daniel & B. Bartholomew 4744* (CAS, IBUG, MICH); road from Hwy. 15 to Cofradía, 8.4 mi E of Hwy. 15 and ca. 1–2 mi NE of Santa María del Oro, *T. Daniel & B. Bartholomew 4781* (CAS); Mpio. Tepic, 11 km W de Jalcocotán, carr. a Tepic, 21°31'N, 105°02'W, *G. Flores F. & R. Ramírez R. 2492* (MICH, MO); Tepic, *M. Jones 23397* (MO, POM); La Bajada, SE of San Blas, *E. Lehto 24230* (ASU); Tepic, *E. Palmer s.n.* (MICH).

***Dicliptera novogaliciana* T.F. Daniel, sp. nov.**

TYPE.— MEXICO. **Jalisco:** Cuastecomate Bay at NW end of Melaque, ca. 1 mi NW jct. Hwy. 200 to Barra de Navidad, ca. 19°13'N, 104°44'W, 9 m, deciduous forest, 19 Mar 1982, *T. Daniel 2106* (holotype: CAS! isotypes: ASU! BR! ENCB! IEB! IBUG! K! MEXU! MICH! NY! US!).

Herbae perennes vel frutices. Cymae sessiles vel pedunculatae in axillis foliorum, pedunculi 1–23 mm longi. Cymulae (1–)2–4 in cyma, pedunculatae, pedunculi 2–13 mm longi. Cymulae bracteolae externae ovatae vel deltatae, 10–23 mm longae, 6–20 mm latae, binatim subaequales vel inaequales. Corolla non resupinata, roseo-purpurea vel rubra, 35–45 mm longa. Stamina 20–33 mm longa, thecis 1.2–1.6 mm longis. Capsula 7–8.5 mm longa, glabra.

Erect perennial herbs or shrubs to 2.5 m tall. Young stems hexagonal, internodes nearly glabrous to scurfy (i.e., with irregular ± trichomelike protuberances ca. 0.01 mm long), nodes pubescent with flexuose to antrorse eglandular trichomes to 0.6 mm long. Leaves petiolate, petioles to 35 mm long, blades lanceolate to ovate to elliptic, 14–158 mm long, 5.5–70 mm wide, 1.9–5 times longer than wide, acuminate at apex, acute at base, surfaces sparsely pubescent with antrorse eglandular trichomes (especially along major veins). Cymes (alternate to) opposite, sessile to pedunculate in leaf axils, 1–2 per axil, peduncles 1–23 mm long. Bracts subtending cymes ± acicular to subulate to oblanceolate, rarely petiolate, 1.5–10 mm long, 0.2–4 mm wide, abaxial surface glabrous to ± scurfy. Cymules (1–) 2–4 per cyme, pedunculate, peduncles 2–13 mm long. Outer

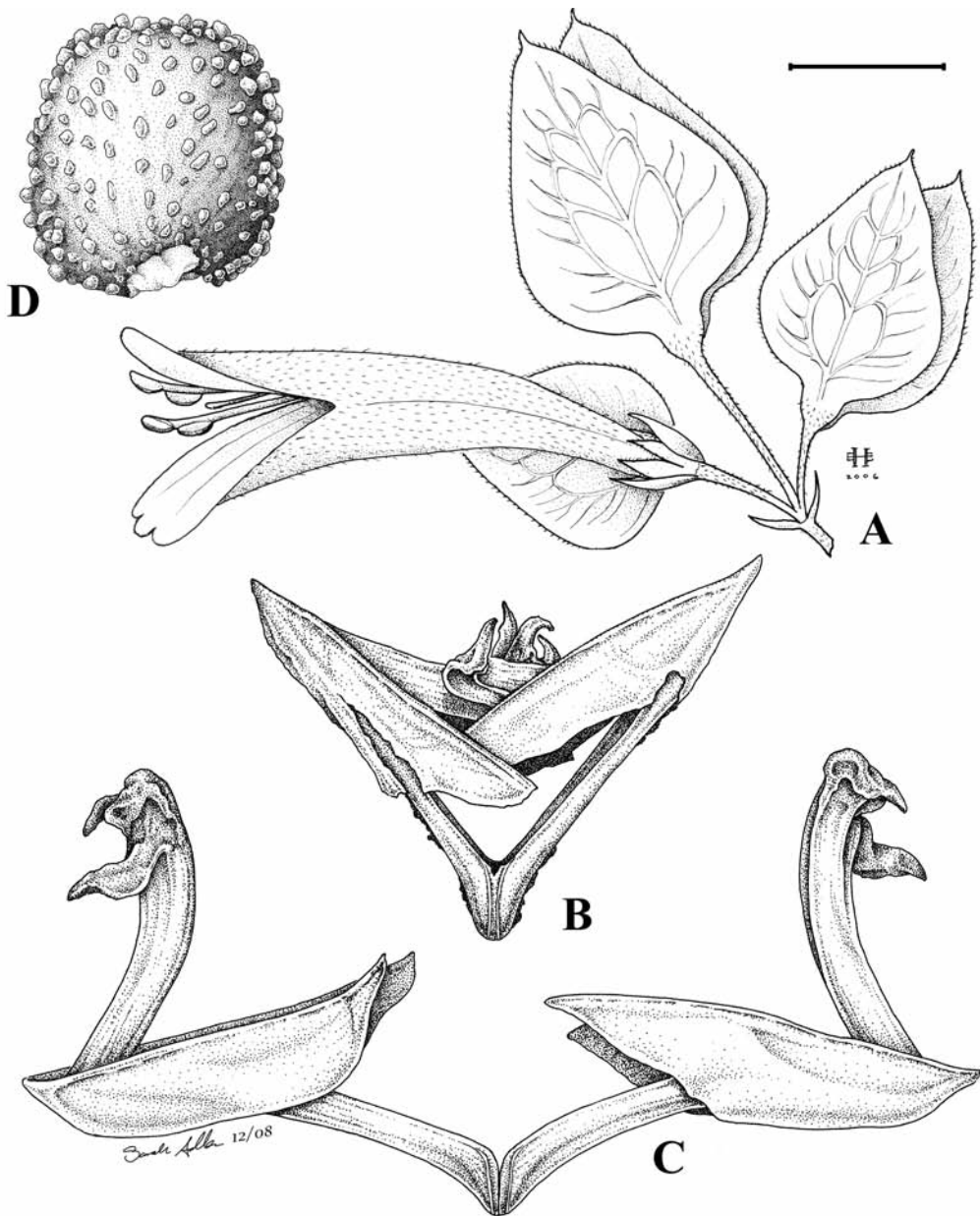


FIGURE 6. *Dicliptera novogaliciana*, A. Cyme with three cymules and one flower, one outer cymule bracteole removed to show inner cymule bracteoles, calyx, and base of corolla (from specimens and images of *Daniel 2106* and *5279*). B. Capsule partially dehiscent (*Daniel & Bartholomew 4877*). C. Capsule fully dehiscent (*Daniel 2109*). D. Seed (*Lott et al. 2222*). Scale for A = 1 cm, for B and C = 2.4 mm, and for D = 0.85 mm. (A. Drawn by E. Hunter. B–D. Drawn by Sarah Adler.)

cymule bracteoles ovate to deltate, 10–23 mm long, 6–20 mm wide, those of a pair subequal to unequal in size with the larger one 1.1–1.4 times longer than the smaller one, rounded to acute and submucronate to mucronate (mucro 0.05–0.3 mm long) at apex, truncate to subcordate to cuneate at base, abaxial surface glabrous to \pm scurfy, rarely with a few antrorsely appressed eglandular tri-

chomes along major veins. Inner cymule bracteoles narrowly lanceolate to ovate, (1.5-) 3-6 mm long, 0.9-1.2 mm wide, abaxial surface glabrous or with a few antrorse eglandular trichomes to 0.2 mm long, margin ciliate. Flowers sessile, nototribic. Calyx 3-5 mm long, lobes triangular to lanceolate to ovate, 2.2-3.5 mm long, abaxially glabrous or very sparsely pubescent with antrorse eglandular trichomes to 0.2 mm long, margin ciliate. Corolla not resupinate, pinkish purple to light red to bright red, 35-45 mm long, externally pubescent with erect to flexuose to retrorse eglandular trichomes 0.2-0.5 mm long, tube 19-27 mm long, 2.5-3.5 mm in diameter near midpoint, gradually expanded distally, upper lip 12-19 mm long, entire to 2-fid, lower lip 12-18 mm long, 3-lobed, lobes 0.2-1 mm long. Stamens 20-33 mm long, inserted in proximal or distal half of corolla tube, filaments pubescent with eglandular trichomes, thecae 1.2-1.6 mm long, subparallel to subperpendicular, overlapping slightly to superposed (touching or with a gap to 0.7 mm long between thecae); pollen perprolate, 3-colporate, 6-pseudocolpate, interapertural exine reticulate. Style 33-43.5 mm long, sparsely pubescent with eglandular trichomes, stigma equally 2-lobed, lobes to 0.2 mm long. Capsule 7-8.5 mm long, glabrous. Seeds squarish, somewhat flattened laterally, 1.8-2.5 mm long, 1.5-1.9 mm wide, testa tuberculate (at least on and near margin), tubercles lacking barbs, sometimes becoming irregular and roughened ridges on faces of mature seeds.

ILLUSTRATION.— Figure 6.

PHENOLOGY.— Flowering: November-April; fruiting: November-April.

DISTRIBUTION AND HABITATS.— Coastal regions of Jalisco, Colima, and Michoacán where plants occur on rocky hills and stream banks in tropical deciduous or subdeciduous forests (with *Acacia*, *Hura*, *Brosimum*, *Celaenodendron*, *Astronium*, *Bursera*, *Colubrina*, *Tabebuia*, *Forchammeria*, *Orbignya*, and *Acalypha*) at elevations of 9-100 m (Fig. 7).

Because of a superficial resemblance of plants from coastal Nueva Galicia to the imperfectly known *D. inutilis* from Guatemala (especially in characters of the cymes and cymules), specimens here treated as *D. novogaliciana* have sometimes been identified with the former name. Study of the two known, and somewhat disparate, Guatemalan specimens of *D. inutilis* reveals that Mexican and Guatemalan plants can be distinguished by the differences in the following couplet:

- 1a. Internodes nearly glabrous to scurfy (i.e., with irregular ± trichomelike protuberances ca. 0.01 mm long); peduncles of cymules 2-13 mm long; abaxial surfaces of outer and inner cymule bracteoles, calyx, and corolla eglandular; calyx 3-5 mm long; capsule glabrous; plants occurring from 9-100 m in western Mexico *D. novogaliciana*
- 1b. Internodes ± evenly pubescent with flexuose to antrorse to retrorse eglandular trichomes 0.1-0.3 mm long; peduncles of cymules 1.5-3 mm long; abaxial surfaces of outer and inner cymule bracteoles, calyx, and corolla sometimes inconspicuously glandular; calyx 5.2-5.7 mm long; capsule pubescent; plants occurring at about 1200 m in southern Guatemala *D. inutilis*

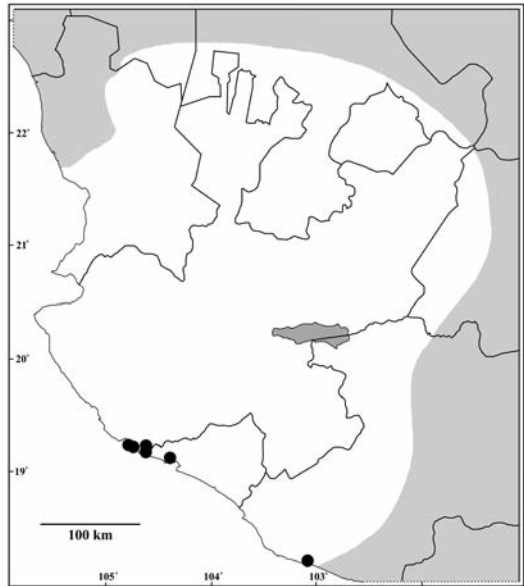


FIGURE 7. Distribution of *D. novogaliciana*.

Hinton's collection from Michoacán differs from the others by its reduced inner cymule bracteoles (1.5 mm long) and more tightly congested cymes. The smaller capsules of this collection (4–5.5 mm long) appear to be immature.

PARATYPES.— **Colima:** along Hwy. 200 SE of Cihuatlán, 4.8 mi NW of Puente Miramar near Santiago, *T. Daniel 2109* (ASU, CAS, MEXU). **Jalisco:** Playa Cuastecomate at N end of Melaque, *T. Daniel 5279* (CAS), *T. Daniel & B. Bartholomew 4877* (CAS, IBUG, K, MEXU); overlooking Cuastecomate Bay at NW end of Melaque, ca. 1 mi NW jct. Hwy. 200 to B. de Navidad, *T. Daniel & M. Butterwick 3235* (CAS, MEXU, MICH); Mpio. La Huerta, 2.6 km S de la desviación a La Manzanilla, KM 11 de la carr. Barra de Navidad–Pto. Vallarta, *E. Lott et al. 2222* (CAS, MEXU); Mpio. Cihuatlán, río cerca de El Aguacate, ca. 4 km N de la carretera Melaque-Cihuatlán, brecha a Cihuatlán, *J. Magallanes 2856* (ASU, MICH); 5 mi WSW of Cihuatlán, *R. McVaugh 20793* (MICH); near Playa de Cuastecomate, 8 km NW of Navidad, *R. McVaugh & W. Koelz 1677* (MICH); Barra de Navidad, *L. Villareal de Puga 65* (ENCB); Mpio. Barra de Navidad, cerca de la Playa Cuastecomate, *L. Villareal de Puga 5142* (IBUG). **Michoacán:** Distr. Coalcomán, Pichilinguillo, *G. Hinton et al. 15913* (MICH, RSA, SD, US).

Dicliptera peduncularis Nees in A. de Candolle, Prodr. 11:488. 1847.

Diapedium pedunculare (Nees) Kuntze, Revis. Gen. Pl. 2:485. 1891.

TYPE.— MEXICO. **State Unknown:** without locality or date, *A. Aschenborn* “pl. exs. n. 449” (fide protologue; syntype: herbarium not cited); **Hidalgo:** “prope los Banos” (fide protologue), *C. Ehrenberg s.n.* (syntype: B, destroyed); **Hidalgo:** “prope los Banos de Azote” (fide protologue), Oct, *C. Ehrenberg 1141* (syntype: B, destroyed; isosyntypes: BM! POM! P! PR! US!). Nees (1847) indicated that he saw specimens of this species in Aschenborn's herbarium and at B. Two syntypes (the Ehrenberg collections) were specifically cited as being at B and it may be assumed that Aschenborn's collection was in Aschenborn's personal herbarium. Alwin Aschenborn's collections are known to be at B, BR, E, JE, KIEL, and W (Lanjouw and Stafleu 1954). The two syntypes at B were destroyed, but until these and other herbaria can be searched for the remaining syntype, it seems premature to designate one of the known isosyntypes as lectotype for this species. Also in the protologue, Nees (1847) treated Aschenborn's collection and that of Ehrenberg from “prope los Banos” as an unnamed (“ α ”) variety whereas *Ehrenberg 1141* from “prope los Banos de Azote” was treated as a different unnamed (“ β ”) variety.

Perennial herbs to 4 dm tall; cymes sessile to subsessile (peduncles to 3 mm long) from axils of leaves (sometimes reduced in size distally); cymules sessile or pedunculate (at least some distinctly pedunculate on each plant, peduncles to 90 mm long); outer cymule bracteoles linear to linear-lanceolate to oblanceolate to hour-glass shaped, 0.5–3 mm wide, those of a pair unequal in size; corolla resupinate 180°, rose-purple to whitish, 8–10 mm long, externally eglandular; capsule 5–6 mm long, glabrous.

ILLUSTRATIONS.— Sánchez S. (1979: t. 297C); Daniel and Acosta C. (2003:27); Calderón de Rzedowski and Rzedowski (2004:265).

PHENOLOGY.— Flowering: October–February; fruiting: October–February.

DISTRIBUTION AND HABITAT.— Endemic to Mexico (Aguascalientes, Distrito Federal, Guanajuato, Hidalgo, Jalisco, Michoacán, México, Oaxaca, Puebla, San Luis Potosí); plants in Nueva Galicia occur in disturbed areas (pastures, roadsides) at elevations of 1300–1920 m (Fig. 5B).

Daniel (1999) provided a comprehensive description of this species for plants in the Tehuacán-Cuicatlán Valley, and Daniel and Acosta C. (2003) described plants from the Bajío Region of central Mexico. The entities recognized by Nees (1847) in the protologue differ in stems and leaves of the vegetative portions (hirsute vs. nearly glabrous or at least not hirsute). Variation in stems and leaves, encompassing both conditions noted by Nees (1847), can be observed among specimens from western and central Mexico. Most plants from Nueva Galicia have stems and leaves either

more or less glabrous or sparsely pubescent. Dorado et al. collected plants with white flowers (1679) and others with “violet” flowers (1678) from the same population in Jalisco.

NEUVA GALICIA SPECIMENS EXAMINED.— **Aguascalientes:** Mpio. Calvillo, 1 km E of Colomos, *G. García 4107* (IEB). **Guanajuato:** Mpio. Pénjamo, 17 km W de Pénjamo, *R. Galván & J. Galván 2359* (ENCB); Mpio. Purísima, 5 km W de San Ángel, *R. Galván & J. Galván 2433* (ENCB, IEB); Mpio. Purísima, Los Tanques, cerca de El Palenque, *R. Galván & J. Galván 3243* (ENCB); Mpio. Purísima, alrededores de Jalpa de Canovas, *R. Galván & J. Galván 3259* (ENCB, IEB, MEXU, MO); just N of San Francisco del Rincón, *R. McVaugh 24285* (MICH); vic. of León, “Mendez in h. DC.” (GZU). **Jalisco:** Mpio. Zacoalco de Torres, 9 mi N of Zacoalco toward Acatlán, *O. Dorado et al. 1678* (CAS, RSA), *1679* (RSA). **Michoacán:** Hwy. 15, 3 mi E Jalisco-Michoacán border in Palo Alto, *T. Daniel 1129* (CAS); Hwy. 110, 16.9 mi W jct. Hwy. 15 in Jiquilpan, *T. Daniel et al. 3294* (ASU, CAS, MEXU, MO); vicinity of Volcán Paricutín, *R. Hakala s.n.* (MICH); 3 km E and 8–10 km NE of Cotija de la Paz (ca. 1.5 km S of San Francisco) on road to Jiquilpan, *R. McVaugh 24922* (MICH).

***Dicliptera resupinata* (Vahl) Juss., Ann. Mus. Natl. Hist. Nat. 9:268. 1807.**

Justicia sexangularis Cav., Icon. 3:2. 1795, non L. (1753). *Justicia resupinata* Vahl, Enum. Pl. 1:114. 1804. *Diapedium resupinatum* (Vahl) Kuntze, Revis. Gen. Pl. 2:485. 1891.

TYPE.— Not designated (see discussion in Daniel, 1997).

Dicliptera pseudoverticillaris A. Gray, Proc. Amer. Acad. Arts 20:308. 1885.

TYPE.— MEXICO. **Sonora:** valley of the Altar, 2 Apr 1884, *C. Pringle 27* (lectotype, designated by Daniel, 1997: GH!).

Dicliptera torreyi A. Gray, Proc. Amer. Acad. Arts 20:309. 1885. *Diapedium torreyi* (A. Gray) A. Heller, Cat. N. Amer. Pl. 7. 1898.

TYPE.— UNITED STATES. **Arizona:** unspecified collections of Thurber, Wright, Schott, Rothrock, Lemmon, and Pringle were cited (syntypes, see discussion in Daniel 1997).

Dianthera sexangularis Sessé & Moc., Pl. Nov. Hisp. 5. 1887.

TYPE.— Icones Florae Mexicanae no. 22. Original plate preserved at Hunt Institute for Botanical Documentation, Pittsburgh, Pennsylvania, USA (lectotype, designated by Daniel, 1997).

Dicliptera formosa Brandegees, Proc. Calif. Acad. Sci., ser. 2, 3:162. 1891.

TYPE.— MEXICO. **Baja California Sur:** summit of Sierra de San Francisquito, 20 Oct 1890, *T. Brandegees 455* (holotype: UC! isotypes: GH! NY).

Dicliptera resupinata var. *orbicularis* B.L. Rob. & Seaton, Proc. Amer. Acad. Arts 28:114. 1893.

TYPE.— MEXICO. **Jalisco:** barranca near Guadalajara, Oct 1891, *C. Pringle 5169* (holotype: GH; isotype: MEXU!).

Annual or perennial herbs to 1 m tall; cymes sessile to pedunculate (peduncles to 50 mm long) from leaf axils; cymules sessile to pedunculate (at least some distinctly pedunculate on each plant, peduncles to 75 mm long); outer cymule bracteoles reniform to cordate to deltate, 5–11.5 mm wide, those of a pair ± equal in size; corolla resupinate 180°, pinkish to pink-purple (rarely reported as “white”) and sometimes with darker maroon markings on upper lip, 9–12 (–21) mm long, external-ly eglandular; capsule 4–6 mm long, glabrous.

ILLUSTRATIONS.— Wiggins (1980:190); Daniel (1997:331).

PHENOLOGY.— Flowering: October–June; fruiting: October–June.

DISTRIBUTION AND HABITATS.— Southwestern United States (Arizona, New Mexico) and western Mexico (Baja California Sur, Chihuahua, Colima, Durango, Guerrero, Jalisco, México, Michoacán, Nayarit, Sinaloa, Sonora, Zacatecas); plants from Nueva Galicia occur in tropical deciduous forests, savannahs, oak forests, pine-oak forests, pine forests, and mesophytic montane forests at elevations of 20–1500 m (Fig. 8A). Plants often are encountered in naturally (e.g., along watercourses) or artificially (e.g., roadsides) disturbed habitats, and are frequently locally abundant or weedy.

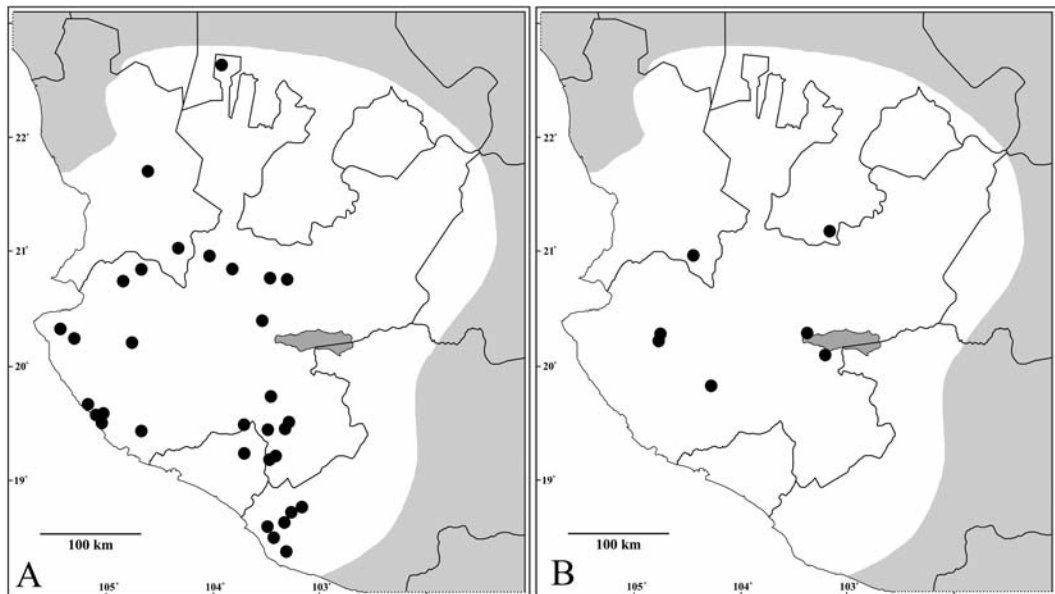


FIGURE 8. A. Distribution of *Dicliptera resupinata* in Nueva Galicia. B. Distribution of *D. thlaspioides* in Nueva Galicia.

LOCAL NAME.—“Organillo” (*Howell 10522*).

This widely distributed species exhibits considerable morphological variation with respect to the form and abundance of pubescence, degree of reduction or elaboration of the cymes, form of the outer cymule bracteoles, corolla size, and seed sculpture. Forms with \pm contracted cymes are sometimes mistaken for *D. nervata*, which differs by its usually pubescent capsules and outer cymule bracteoles that are ovate to widely obovate in shape. Daniel (1997, 2004) provided a comprehensive description of this species, proposed nomenclatural adjustments, and discussed some of the morphological variation of *D. resupinata* in western Mexico.

NUEVA GALICIA SPECIMENS EXAMINED.—**Colima:** Colima, *C. Orcutt 4527* (DS, MO), *s.n.* (F); Colima, *E. Palmer 1171* (MICH). **Jalisco:** Bahía Chamela, ca. 10 km N of Chamela, *W. Anderson & C. Anderson 6139* (MICH); south-central Cabo Corrientes, 26 km W of El Tuito, 5 km W of Llano Grande (= 4 km E of Los Conejos), ca. 20°18'N, 105°31'W, *T. Cochrane et al. 11997* (CAS, MICH); between Magdalena and Nayarit border, 11 mi NW of Magdalena, 3 mi N of El Zapote, *T. Croat 45132* (MO); Hwy. 200 S of Puerto Vallarta, 7.6 mi S of El Tuito, *T. Daniel 2072* (ASU, CAS); Hwy. 110 S of Tecalitlán, 3.1 mi N of turn to Jilotlán de los Dolores, *T. Daniel 2134* (CAS); Hwy. 200, 0.3 mi N of bridge at Río San Nicolás, *T. Daniel & M. Butterwick 3226* (CAS); ca. 32 km NE of San Sebastián toward Mezquites, *T. Daniel & A. Ton 6072* (CAS); near Arroyos del Agua, ca. 10 km NW of Huejuquilla el Alto, *C. Feddema 2363* (MICH); La Barranca, Guadalajara, *M. Jones 27389* (DS, POM), *27437* (POM), *97385* (MO); Mpio. Tequila, Volcán Tequila, 1 mi S of Tequila, *A. Liston et al. 633-8* (CAS, RSA); Mpio. La Huerta, Chamela Biological Station: *E. Lott 874* (CAS, MO), *1428* (MO); *J. Miller et al. 408* (CAS, MO); *L. Pérez J. 260* (CAS, MO), *586* (MO); 2 mi N of La Cuesta, road to Talpa de Allende, *R. McVaugh 21139* (MICH, US); 3–6 km S of La Huerta, near hwy. to Bahía Navidad, *R. McVaugh 23045* (MICH); barranca near Los Camachos, hwy. near KM 20 N of Guadalajara, *R. McVaugh 24426* (MICH); ca. 12–13 km SW of Pihuamo, *R. McVaugh 24461* (MICH); Barranca de Beltrán, 12–15 km NE of Tonila, *R. McVaugh 24950* (MICH); Estación Biológica, UNAM, 8 km E of Chamela, *R. McVaugh 25123* (MICH); vicinity of Estación Biológica, UNAM, 3 km SE of Chamela, *R. McVaugh 26261* (MICH), *26286* (MICH); Rancho Paraíso, ca. 10 km SE of Chamela, *R. McVaugh 26274* (MICH); 4 mi N of Tecalitlán, *R. McVaugh & W. Koelz 1322* (MICH); 8 mi SW of Pihuamo, *R. McVaugh & W. Koelz 1514* (MICH); near San Sebastián, *Y. Mexia 1662* (CAS, DS, MICH, MO, US); Mpio. Cd. Guzmán, Laguna de Zapotlán, 6 km N de Cd. Guzmán, *A. Morones G. 217* (CAS, MICH); 21.7 mi de Chamela rumbo

a Pto. Vallarta, adelante del Río San Nicolás, *L. Pérez J.* 338 (CAS, MO); barranca near Guadalajara, *C. Pringle 6145* (CAS, MICH, MO, POM, US); Barranca of Guadalajara, *C. Pringle 11077* (MICH, MO, US); Mpio. Zapotitlán, Rancho El Jabalí, 25 km (air) NNW of Colima, road to Lago Calabozo, NE of Lago Epazote, ca. 19°27'N, 103°41'W, *A. Sanders et al.* 10440 (CAS); near jct. hwy. 15 and 80, W of Lake Chapala, *B. Templeton 9462* (RSA); Mpio. Zapotitlán, Rancho El Jabalí, 22 km NNW of Colima, El Cañón below Hac. San Antonio, *L. Vazquez V.* 496 (RSA); ca. 103°44'W, 19°27'N, El Limón, *S. Zamudio et al.* 4756 (CAS). **Michoacán:** Mpio. Coalcomán, 29.8 km W de Coalcomán o 22.6 km E de Villa Victoria, *C. Cowan 4913* (CAS); Mpio. Aquila, bank of Río de Ostula, *J. Hill s.n.* (MICH, RSA); Distr. Coalcomán, Aquila, *G. Hinton et al.* 12619 (MICH, MO, RSA, US), 16233 (MICH, RSA, US); Distr. Coalcomán, Coalcomán, *G. Hinton et al.* 12865 (MICH, RSA, US); Distr. Coalcomán, Sierra Naranjillo, *G. Hinton et al.* 15774 (MICH, RSA, US); Distr. Coalcomán, Coyre, *G. Hinton et al.* 15882 (MICH, RSA, US). **Nayarit:** Mpio. Nayar, Colorado de la Mora, Arroyo de Los Negros, 150 m NW del poblado, *O. Bravo-Bolaños 2189* (MEXU); archaeological site along Hwy. 15, E of Ixtlán, ca. 10 mi ESE of Ahuacatlán, *T. Daniel & B. Bartholomew 4787* (CAS); Islas Marias, María Madre, *J. Howell 10522* (CAS); Islas Marias, María Madre, *H. Mason 1798* (CAS). **Zacatecas:** Mpio. Moyahua, Cerro Los Pochotes, 9 km S de Moyahua por la carretera Méx 54, tramo Moyahua-Ixtlahuacá del Río (Jalisco), *E. Enríquez E. and J. Balleza C.* 1724 (MEXU).

***Dicliptera thlaspioides* Nees in A. de Candolle, Prodr. 11:474. 1847.**

Diapedium thlaspioides (Nees) Kuntze, Revis. Gen. Pl. 2:485. 1891.

TYPE.—MEXICO. Morelos: “Cordillère de Guchilaque,” [fide specimen; = Cordillera de Huitzilac, near Cuernavaca], “Americâ meridionali, ad latus occidentale cordillerae” [fide protologue], *L. Berlandier 1013* (holotype: G ex hb. Moricand, photos: GH! MICH! NY! US! isotype: GZU!).

Dicliptera pringlei Greenm., Proc. Amer. Acad. Arts 32:302. 1897.

TYPE.—MEXICO. Morelos: lava beds, near Cuernavaca, 3 Nov 1896, *C. Pringle 6602* (lectotype, designated here: GH! isolectotypes: CAS! K, MEXU! NY! PR! PRC! US!).

Annual to perennial herbs to 8 dm tall; cymes pedunculate (peduncles 3–25 mm long) from axils of leaves (sometimes reduced to bracts distally), forming an open terminal leafy panicle; cymules pedunculate (peduncles 10–35 mm long); outer cymule bracteoles widely elliptic to circular, 4.4–7 mm wide, those of a pair equal in size; corolla resupinate 180°, whitish to cream with pinkish-purple markings on lips, 14–18 mm long, externally eglandular; capsule 6–8 mm long, glabrous.

ILLUSTRATION.—Daniel (1999:25).

PHENOLOGY.—Flowering: October–December; fruiting: October–December.

DISTRIBUTION AND HABITAT.—Endemic to Mexico (Guerrero, Jalisco, México, Michoacán, Morelos, Nayarit, Oaxaca, Zacatecas); plants in Nueva Galicia occur in tropical deciduous forests, oak forests, and disturbed habitats (where sometimes abundant) at elevations of 300–1900 m (Fig. 8B).

Daniel (1999) provided a comprehensive description of this species. In the protologue of *Dicliptera pringlei* Greenman (1897) cited two syntypes, the Pringle collection designated above as lectotype, and *Nelson 2256* (syntype: GH! isosyntype: US!) from near Tlalixtaquilla in Guerrero (collected 10 December 1894).

NEUA GALICIA SPECIMENS EXAMINED.—**Jalisco:** Mpio. Tuxcueca, Cerro el Alto, al S de San Nicolás, *J. Machuca N.* 6738 (MICH); 2.5–4 mi N of La Cuesta, rd. to Talpa de Allende, *R. McVaugh 21199* (MICH); above W end of Lake Chapala, midway between Jocotepec and San Juan Cosalá, *R. McVaugh & W. Koelz 384* (MICH); 10 km N de La Cuesta, *J. Rzedowski 15132* (MICH); 14–15 mi N of Autlán de Navarro on road to Guadalajara (Hwy. 80), ca. 19°55'N, 104°15'W, *G. Webster & G. Breckon 15986* (GH, MICH, MO). **Nayarit:** 10 mi SE of Ahuacatlán on rd. to Barranca del Oro and Amatlán, *R. McVaugh & W. Koelz 737* (MICH).

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