

NEW TAXA OF ACANTHACEAE FROM
THE RIO PALENQUE SCIENCE CENTER IN ECUADOR

Dieter C. Wasshausen*

Ruellia riopalenquensis Wasshausen, sp. nov. (Plate 2:D-F.)

Frutex vel suffrutex, caulibus subquadrangularibus, glabris vel parce (aliquando bifariam) pubescentibus; lamina foliorum ovato-lanceolata, acuminata, basi acuta et secus petiolum decurrens, undulata, glabra, in costa et venis pubescens; flores sessiles, spicam formantes; bracteae lineares; bracteolae triangulari-subulatae, minute pubescentes; calycis segmenta lineari-subulata; corolla purpurea pallida, hypocrateriformis, glabra vel minute pubescens, lobis ovatis, emarginatis; stamina vix exserta; capsulae clavatae, glabrae; semina orbiculata, plana, brunneo-purpurea.

Large woody shrub; stems subquadrangular, glabrous or thinly pubescent with minute white curved hairs, these sometimes in lines; leaf blades ovate-lanceolate, 11-16 cm long and 4-7 cm wide, acuminate at apex, acute and decurrent on petiole at base, undulate, dark green above, glabrous except costa and lateral veins (4-6 pairs), these pubescent with small appressed hairs, cystoliths numerous, conspicuous under magnification; petioles 1.3-2 cm long, glabrous or minutely pubescent; flowers borne in small, opposite, sessile clusters, forming a terminal spike, lowermost clusters in the axils of upper leaves, uppermost clusters confluent; rachis pubescent, the hairs minute, curved; bracts linear, 6 mm long, 0.3 mm wide; bractlets triangular-subulate, 1.5 mm long, minutely pubescent; calyx 7-9 mm long, segments linear-subulate, 6-7 mm long, 0.6 mm wide at base, dark colored in dried specimens, bearing a few minute hairs, cystoliths prominent under a lens; corolla 2.3-2.7 cm long, light purple, glabrous or inconspicuously puberulous, lower half of tube slender, about 1.5 mm in diameter, upper half campanulate, slightly oblique, 6-7 mm at mouth, about 1.1 cm broad, lobes ovate, 5.5 mm long and 4.5 mm wide, emarginate, somewhat irregular; stamens attached to base of expanded portion of corolla tube, the larger of each pair slightly exserted, filaments flattened, glabrous, anthers 2 mm long, 0.5 mm wide, pollen grains 3-porate, spheroidal, 54-60 μ in diameter, homobrochate reticulum; pistil 2 cm long, ovary and style glabrous, stigma lobe oblong, thin, 1 mm long, 0.4 mm wide; capsule 13 mm long, glabrous, solid stipitate portion about 7 mm long, seed-bearing portion somewhat flattened, oval, about 4 mm broad, 4-seeded; seeds suborbicular, flat, reddish-brown, 2-2.5 mm broad, the flat surface glabrous, margins minutely mucilaginous-tomentose when moistened.

TYPE: *ECUADOR*: LOS RÍOS: Río Palenque Science Center, km 56 Quevedo-Santo Domingo, alt. 150-220 m, 3 Sept. 1972, *Dodson & McMahon 5053* (HOLOTYPE: US, ISOTYPE: SEL).

DISTRIBUTION: Western Ecuador, common along trails in deep forest, known only from the type locality.

Ruellia riopalenquensis is closely related to *R. pennellii* Leonard, but the bracts of that relative are longer, 10-20 mm long and 0.5-1 mm wide, the calyx is smaller, 4-6 mm long, the corolla and its lobes larger, 3-3.5 cm long and 10 mm long and 7 mm wide respectively.

*Dept. of Botany, Smithsonian Institution, Washington, D. C. 20560.



Plate 2. *Justicia* and *Ruellia*. a-c, *Justicia pectoralis* var. *ovata*: a, habit, $\times .7$; b, bract, bractlets, and calyx, $\times 11.2$; c, corolla, $\times 5.6$; d-f, *Ruellia riopalenquensis*: d, habit, $\times .7$; e, bracts, bractlets, and calyx, $\times 5.6$; f, corolla, $\times 2.8$.

Dicliptera dodsonii Wasshausen, sp. nov.

(Plate 3:A-C.)

Herba diffusa, caulibus subhexagonis, glabris vel nodis puberulis; lamina foliorum lanceolata, acuminata, basi obtusa, satis firma, integra vel undulata, utrinque glabra, costa et venis lateralibus plus minusve puberulis; petioli aliquanto graciles; cymae axillares, 3-partitae (aliquando 4-partitae), pedunculi puberuli; bracteae cymas subtendentes lineari-lanceolatae, glabrae vel parce pilosae; bracteae cymularum ovatae, inferiores aliquanto minor quam superiores, ambae acuminatae et apiculatae, basi obtusae, virides, glabrae vel parce puberulae; flores sessiles, bracteae intimae lanceolatae, puberulae; calycis segmenta lanceolata, puberula; corolla aurantiaca, subtiliter pubescens, labio superiore oblongo, acuto, labio inferiore oblongo vel elliptico, apice minute trilobato, lobis parvis, rotundatis; stamina exserta, antherae loculi subtiliter superpositi.

Rambling suffrutescent herb; stem subhexagonal, glabrous or the nodes puberulous with curved hairs; leaf blades lanceolate, 5-6.5 cm long, 1.9-2.2 cm wide, acuminate, obtuse or rounded at base, drying dark olive green, rather firm, entire or undulate, both surfaces glabrous except costa and basal portion of lateral veins (4 or 5 pairs), these sparingly to rather densely puberulous with recurved hairs, cystoliths moderately conspicuous under a lens; petioles rather slender, 3-6 mm long, glabrous or the channels more or less puberulous; cymes axillary, mostly 3-parted (sometimes 4-parted), peduncles puberulous, 3.5-6 cm long from base to node, 0.6-1 cm long from node to cymules, subhexagonal, slightly flattened at node, glabrous or sparingly puberulous; bracts subtending cymes linear or sometimes narrowly lanceolate, 10-12 mm long, glabrous or sparingly pilose; cymule bracts obliquely ovate, 2.5-3.5 cm long, 1.2-1.7 cm wide, posterior about 4 mm longer and wider than anterior, both acuminate and mucronate at tip, obtuse at base, thin, green, glabrous or the costa inconspicuously puberulous; flowers solitary, subsessile, subtended by several pairs of lanceolate bracts, these 5-8.5 mm long, 1-1.5 mm wide, acuminate, subchartaceous, puberulous; calyx 6 mm long, densely puberulous except the glabrous basal portion of the narrowly campanulate tube, segments lanceolate, 4 mm long and 1 mm wide; corolla orange, finely pubescent, 3.5 cm long, tube 2.5 mm broad at base, narrowed to 1.5 mm at 5 mm above base, 5 mm broad at mouth, the lips subequal, 1.8 cm long, upper lip oblong, 4 mm broad, acute, lower lip oblong to elliptic, 5 mm broad, rounded, the tip minutely 3-lobed, lobes 2 mm long and wide, rounded; stamens exserted about 1.6 cm beyond mouth of corolla tube, filaments flattened, subglabrous or sparingly hirtellous toward base, anther lobes slightly superposed, 2.5 mm long, 0.8 mm wide, pollen grains 3-colporate, prolate, 50 μ long, 30 μ wide, each mesocolpium provided with two long, narrow, colpoid streaks, the sexine punctitegillate; style slightly longer than stamens, stigma bilobed, lobes linear, obtuse, 0.25 mm long; capsule ovate, flattened, 8 mm long, 4-5 mm broad, 1 mm thick, densely hirtellous, the hairs white; seeds not seen.

TYPE: *ECUADOR*: LOS RÍOS: Río Palenque Science Center, km 56 Quevedo-Santo Domingo, alt. 150-220 m, 26 Oct. 1974, along trail to generator near overlook, *C. H. Dodson 5719* (HOLOTYPE: US, ISOTYPES: MO, Rio Palenque Science Center, SEL).

DISTRIBUTION: Western Ecuador. Known only from the type locality.

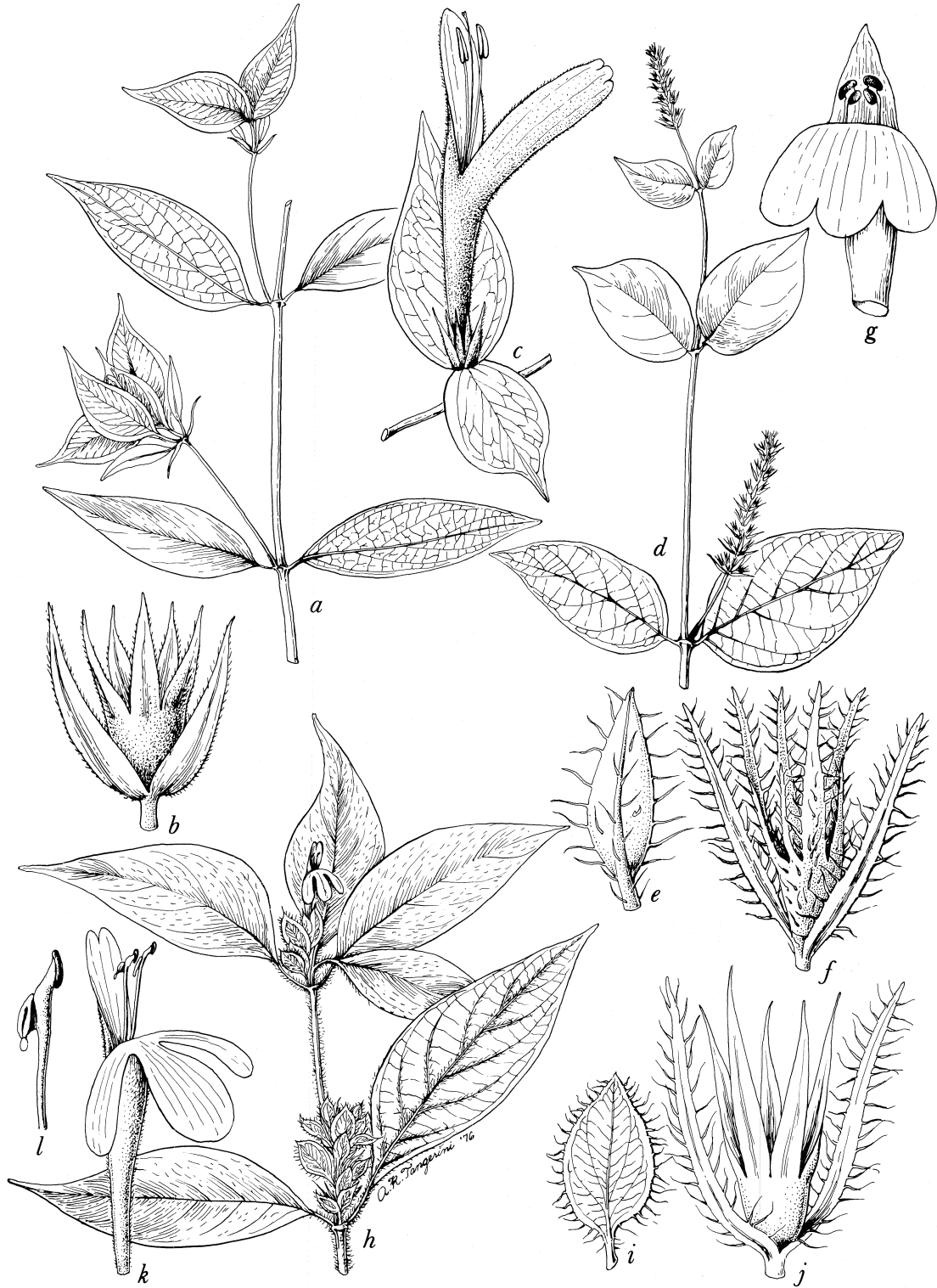


Plate 3. *Dicliptera* and *Justicia*. a-c, *Dicliptera dodsonii*: a, habit $\times .7$; b, innermost bracts and calyx $\times 3.5$; c, expanded cymule bracts and corolla, $\times 1.4$; d-g, *Justicia riopalenquensis*: d, habit, $\times .7$; e, bract, $\times 7$; f, bractlets and calyx, $\times 7$; g, corolla, $\times 6.3$; h-l, *Justicia ianthina*: h, habit, $\times .7$; i, bract, $\times 2.8$; j, bractlets and calyx, $\times 7$; k, corolla, $\times 3.5$; l, anther $\times 3.5$.

Dicliptera dodsonii is not closely allied to its congeners.

This species is named in honor of Dr. Calaway H. Dodson, Director of the Marie Selby Botanical Gardens, in recognition of his valuable service to Ecuadorian botany.

Justicia ianthina Wasshausen, sp. nov.

(Plate 3:H-L.)

Herba recta, parce ramosa, basi aliquando decumbens, caulibus subquadrangularibus, sursum bifariam pilosis, deorsum aliquando glabratis; lamina foliorum ovata, acuminata, basi obtusa, aliquanto tenuis, supra hirtella praecipue in costa et venis positis, subtus hirsuta et hirtella; petioli pilosi; spicae plures, terminales et axillares, erectae vel ascendentes, laxae, rhachibus bifariam et minute strigosis; bracteae flores subtendentes ovatae, acuminatae, basi unguiculatae, ciliatae, glabrae vel costa et venis lateralibus parce strigosae; bracteolae subulatae, ciliatae; calycis segmenta lanceolata, glabra; corolla rosea purpurea ad caerulea, albolineata, minute pubescens, labio superiore erecto, trianguli-ovato, apice bilobato, lobis minutis, obtusis, labio inferiore plus minusve patulo, cuneato, lobis obovatis, apice rotundatis; stamina vix exserta, lobis antherarum superpositis, glabris, lobo inferiore basi calcarato.

Herb to about 70 cm high, erect or sparingly branched, somewhat decumbent at base, stems subquadrangular, pilose, hairs to 2 mm long, these intermixed with minute retrorsely recurved hairs, both types more or less bifariouly arranged, lowermost positions of the stem sometimes terete and glabrate; leaf blades ovate, 7-12 cm long and 3-5 cm wide, acuminate, obtuse at base, rather thin, entire or undulate, upper surface sparingly to densely hirtellous, hairs mostly confined to the costa and lateral veins, appressed, lower surface hirsute and hirtellous, especially the costa and lateral veins, venation (lateral veins 6-7 pairs) more conspicuous beneath than above, cystoliths minute, inconspicuous; petioles 7-15 mm long, densely pilose with long hairs; flowers borne on numerous lax spikes, 2-5 cm long and 1-1.5 cm broad, these terminal and in the axils of the upper leaf blades, erect or ascending, internodes of the inflorescence and rachides bifariouly and minutely strigose; bracts subtending flowers loosely imbricate, ovate, 10-12 mm long, 5-6 mm wide, acuminate at apex, unguiculate at base, ciliate, the flat surfaces glabrous or the costa and lateral veins sparingly strigose; bractlets subulate, 9 mm long, barely 0.5 mm wide, thin, ciliate; calyx 5-6 cm long, deeply segmented, segments lanceolate, 0.6 mm wide, glabrous; corolla 20 mm long, light rose purple to blue with white nectar guides, minutely pubescent, tube 1 mm broad at base, 3-3.5 mm broad at mouth, upper lip erect, triangular-ovate, 3.5 mm wide at base, gradually narrowed to tip; this bilobed, lobes 0.5 mm long, 1 mm wide, obtuse, lower lip more or less spreading, cuneate, 8 mm wide at base of lobes, these obovate, 4 mm long and 3-4 mm wide, rounded at tip; stamens exserted about 4 mm beyond mouth of corolla tube, anthers 1.75 mm long, lobes superposed, vertically attached to connective, glabrous, lower lobe calcarate, tail about 0.25 mm long, blunt, pollen grains 2-porate, bilateral (47 μ long, 28 μ wide); capsules clavate, 11 mm long, 3 mm wide, 1.8 mm thick, glabrous; seeds oblong, about 1 mm long, 1.5 mm wide, and 0.5 mm thick, light brown, tuberculate.

TYPE: *ECUADOR*: LOS RÍOS: Río Palenque Science Center, km 56 Quevedo-Santo Domingo, alt. 150-220 m, 26 Oct. 1974, C. H. Dodson 5740 (HOLOTYPE: US, ISOTYPES: MO, Río Palenque Science Center, SEL).

DISTRIBUTION: Western Ecuador, common in clearings and along roads near rivers, in the provinces of Esmeraldas and Los Ríos, Ecuador.

ADDITIONAL MATERIAL EXAMINED: *ECUADOR*: *ESMERALDAS*: Playa Grande, Cayapa River, 1 Aug. 1967, *Játiva & Epling 2084* (UC, US); *LOS RÍOS*: Along Río Cristal in cacao orchard near Montalvo, alt. 70 m, 13-15 July 1962, *Játiva & Epling 081* (UC, US); Río Palenque Science Center, km 56 Quevedo-Santo Domingo, alt. 150-220 m, 6 March 1974, *C. H. Dodson 5428* (SEL, US).

Justicia ianthina is closely allied with *J. unguiculata* Leonard from Colombia. It has, however, a larger corolla than the Colombian species, ovate bracts, 10-12 mm long, rather than the suborbicular, 6 mm in diameter, bracts ascribed to *J. unguiculata* by Leonard.

***Justicia riopalenquensis* Wasshausen, sp. nov.**

(Plate 3:D-G.)

Herba, caulibus ramosis, plus minusve patulis, subquadrangularibus, bifariam hirtellis; lamina foliorum ovata, acuta vel acuminata, basi obtusa, aliquanto firma, integra, glabra vel parce hirtellis; petioli breves, hirtelli; spicae terminales et axillares, pedunculis gracilibus, subquadrangularibus, hirtellis; bracteae et bracteolae similes et subaequales lance-subulatae, ciliatae; calycis segmenta 5, anguste lanceolata, segmentum anticum reductum, hirtella ciliolata, costa prominente; corolla rosea, puberula, labiis subaequalibus, labio superiore ovato, acuto, labio inferiore plus minusve patulo, 3-lobato, lobo medio ovato, apice rotundato et emarginato, lobis lateralibus oblongis, rotundatis; stamina vix exserta, lobis antherarum leviter superpositis.

Densely matted herb; stems subquadrangular, bifariously hirtellous, the hairs retrorsely curved; leaf blades ovate, 3-5.5 cm long and 2-3 cm wide, acute to acuminate at tip, somewhat oblique and obtuse at base, moderately firm, entire, glabrous or sparingly hirtellous, hairs confined chiefly to costa and lateral veins (about 4 pairs), cystoliths numerous, minute; petioles 2-4 mm long, hirtellous; flowers borne in slender, terminal and axillary spikes, these 2.5-3 cm long, 0.6-1 cm wide, peduncles slender, 1.5-2.5 cm long, subquadrangular, hirtellous, rachis flattened, hirtellous, lowermost internodes 4.5 mm long, becoming successively shorter toward tip of spike; bracts lance-subulate, 4 mm long, 1 mm wide, carinate, glabrous or sparingly hirtellous, ciliate, midrib prominent; bractlets obliquely lance-subulate, 3.5 mm long, 0.4 mm wide, sparingly pilose, ciliate, midrib prominent; calyx segments 5, narrowly lanceolate, 4 of them 3.3 mm long, 0.5 mm wide at base, gradually narrowed to a slender tip, the anterior segment rudimentary, 1.5 mm long, all moderately hirtellous and ciliate, the costa prominent; corollas pink, 8 mm long, throat transversely plicate, spotted with dark purple, moderately pubescent without, tube 0.8 mm broad near base, thence gradually enlarged to 2.25 mm at mouth, lips subequal, 3 mm long, upper lip erect, ovate, 2 mm wide at base, acute at tip, lower lip more or less spreading, 3-lobed, middle lobe ovate, 1.8 mm wide, rounded and shallowly emarginate at tip, lateral lobes oblong, 1 mm wide, rounded, lip swollen and plaited in throat of corolla; stamens exserted 1 mm beyond mouth of corolla, filaments glabrous, anther cells slightly superposed, attached obliquely to a flat connective, upper cell 0.6 mm long, pubescent, slightly longer than lower cell, pollen grains prolate, 2-porate, bilateral (31 μ long, 20 μ wide), provided with one row of rounded insulae with reticulate pattern on either side of each aperture; capsule wanting.

TYPE: *ECUADOR*: LOS RÍOS: Río Palenque Science Center, km 56 Quevedo-Santo Domingo, alt. 150-220 m, 26 Oct. 1974, *C. H. Dodson 5677* (HOLOTYPE: US; ISOTYPES: MO, Río Palenque Science Center, SEL).

DISTRIBUTION: Along banks and trails in deep forests in Ecuador's provinces of Manabi, El Oro, and Los Ríos.

ADDITIONAL MATERIAL EXAMINED: *ECUADOR*: MANABI: prope Hacienda El Recreo, *Eggers 15406* (US); EL ORO: wooded slopes, bordering Quebrada Nudillo and Quebrada Tambillo, tributary to Río Luis, and Piedra Grande, 10 km NE of Curtincapa, alt. 1,615-1,890 m, 13 Aug. 1943, *Steyermark 53854* (US); LOS RÍOS: along Río Cristal in cacao orchard near Montalvo, alt. 70 m, 13-15 July 1962, *Játiva & Epling 080* (US).

Justicia riopalenquensis is not closely allied to its congeners. It superficially resembles *J. pleurolarynx* (Blake) Leonard from Venezuela and Colombia; however, this species has lanceolate to ovate-lanceolate leaf blades, 4-parted calyx without the rudimentary anterior segment, and smaller bracts.

Justicia pectoralis Jacq. var. *ovata* Wasshausen, var. nov. (Plate 2: A-C.)

Suffrutex vel frutex; lamina foliorum ovata; petioli breves; segmenta calycis lanceolata, glabra vel in costa et marginibus hirtella; corolla viridialba, labio superiore apice minute bilobato.

Herbaceous shrub to 1 m high; stems weak, erect or ascending, simple or moderately branched, subquadrangular, shallowly grooved, glabrous or hirsutulous, hairs disposed more or less in two lines, internodes 3.5-7.5 cm long, cystoliths numerous, subpunctiform; leaf blades ovate, 5-7.5 cm long, 2.5-3.5 cm wide, acuminate, obtuse at base, entire or undulate, moderately firm, upper and lower surfaces glabrous, cystoliths prominent under magnification, costa and lateral veins (5-6 pairs) barely discernible but more so beneath than above; petioles slender, 1.2-1.6 cm long, hirtellous; flowers borne in rather loose terminal panicles 6-11 cm long, branches paired or verticillate, simple, subterete, puberulous, the eglandular hairs numerous, glandular hairs fewer, stouter, with broad turbinate tips, lower internode 2 cm long, others successively shorter toward tip of panicle; bracts narrowly lanceolate, 3 mm long, costate, hirtellous; bractlets similar to bracts but smaller; calyx 5-parted, deeply segmented, segments lanceolate, 3.5 mm long, 0.5 mm wide at base, acuminate, costate, glabrous or the margins and costa more or less hirtellous; corollas light green, 8 mm long, throat transversely plicate, spotted with dark purple, outer surface of corolla moderately pubescent, tube 1.4 mm broad at base, 3.5 mm broad at throat, upper lip triangular, erect, 4 mm wide at base, terminating in a subtubular oblong subcucullate tip 1.5 mm long and 1 mm broad, tip itself bilobed, lower lip more or less spreading, cuneate, 6 mm wide near tip, 3-lobed, lobes 1.5 mm long, middle one 2 mm wide, lateral ones 1.5 mm wide, all rounded; stamens attached to corolla tube, free portion 4 mm long, exerted about 2.5 cm beyond throat of corolla, filaments glabrous, anther lobes equally attached or slightly superposed, borne on a connective about 0.5 mm wide, pollen grains bilateral, 2-porate, prolate, 31 μ long, 22 μ wide, isopolar, trema area studded with 10 more or less oblong insulae, these reticulate, coalescing towards the poles; capsule not seen.

TYPE: *ECUADOR*: LOS RÍOS: Río Palenque Science Center, km 56 Quevedo-Santo Domingo, alt. 150-220 m, 6 March 1974, *C. H. Dodson 5453* (HOLOTYPE: US; ISOTYPES: MO, Río Palenque Science Center, SEL).

DISTRIBUTION: Western Ecuador, in deep forest, known only from the type locality.

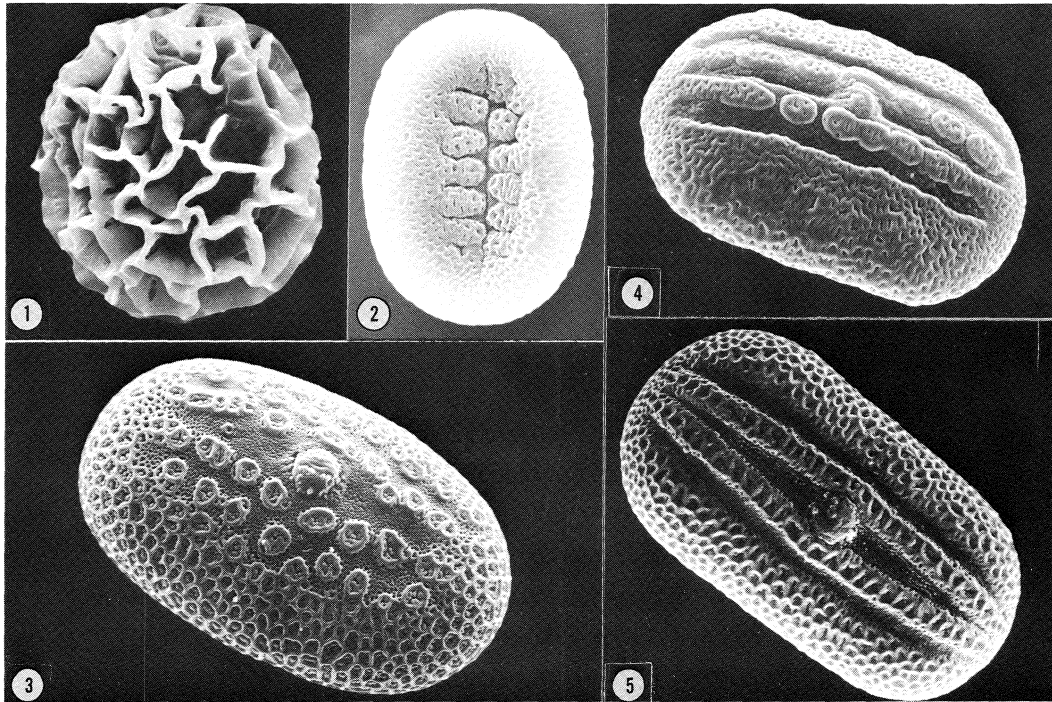


Plate 4. Pollen grains of *Ruellia*, *Justicia* and *Dicliptera*. 1, *Ruellia riopalenquensis*, equatorial view, $\times 1,400$; 2, *Justicia pectoralis* var. *ovata*, equatorial view, $\times 2,700$; 3, *Justicia ianthina*, equatorial view, $\times 2,550$; 4, *Justicia riopalenquensis*, equatorial view, $\times 3,600$; 5, *Dicliptera dodsonii*, equatorial view, $\times 2,100$.

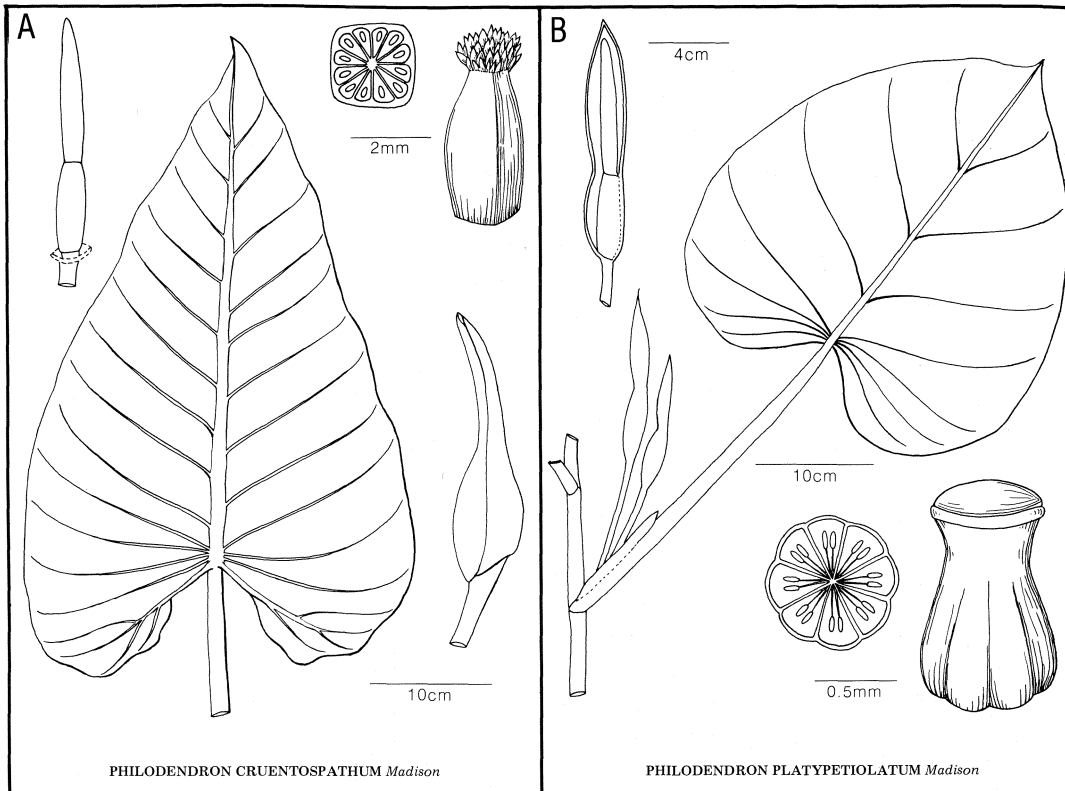


Plate 5