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# NEW SPECIES OF PIPER FROM PANAMA

BY

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## NEW SPECIES OF PIPER FROM PANAMA<sup>1</sup>

By CASIMIR DE CANDOLLE

### PIPER MINUTISPICUM C. DC., n. sp.

Ramulis glabris; foliis modice petiolatis glabris, limbo ovato-lanceolato basi ima leviter inaequilatera utrinque acuto apice acute acuminato, nervo centrali nervos adscendentes altero latere 4 altero 5 mittente quorum supremus a 2.5 cm. supra basin solutus et infimus aliis multo brevior, petiolo paullo ultra basin vaginante; pedunculo glabro quam petiolus multo brevior, spica brevissima rotundata apice mucronata, rhachi parcissime pilosa, bractee glabrae superne cucullatae vertice triangulari carnosae, antheris ovatis filamenta tenuia paullo superantibus, connectivo ultra thecas obtuse producto.

Dioicum. Ramuli spiciferi 1 mm. crassi, collenchyma in fasciculis discretos a latere longe productos dispositum et zona interna ex parte libriforme, fasciculi intramedullares 1-seriati, canalis lysigenus nullus. Limbi in sicco membranacei creberrime pellucido-punctulati, superi usque ad 9 cm. longi et 4 cm. lati. Petioli usque ad limbi latus longius 6 mm., inter limbi latera 2 mm. longi. Pedunculi 5 mm. longi, tenues, spicae juveniles 4 mm. longae et 2 mm. crassae. Stamina 3, antherae 4-valvatae.—Species ut videtur sectionis *Eupiper* C. DC.

PANAMA: Oak and palm forest above Sabana de El Salto, above Boquete, Chiriquí, alt. 1,500-1,750 m., *H. Pittier* 3116.

### PIPER SPERDINUM C. DC., n. sp.

Ramulis villosis; foliis brevissime petiolatis, limbo oblongo-ovato basi valde inaequilatera altero latere auriculato altero subacuto apice acute et longe acuminato supra glabro subtus villosa, nervo centrali

<sup>1</sup> The botanical collections made during the progress of the biological survey of Panama, conducted by the Smithsonian Institution several years ago, contain many specimens of Piperaceae, which, together with other unidentified material, were sent to the late Casimir de Candolle, the preeminent authority upon this family, for elaboration. Among the Panama specimens are represented 27 new species and four new varieties; descriptions of these, by Mr. de Candolle, are given herewith, the types being in the U. S. National Herbarium. The results of Mr. de Candolle's study of the Central American material, chiefly from Guatemala and Costa Rica, will be presented elsewhere.—FREDERICK V. COVILLE.

nervos adscendentes utrinque 3 mittente quorum supremus e 6 cm. supra basin solutus nervis lateralibus altero latere 3 altero 5-6 a basi divaricantibus, petiolo dense villosa basi vaginante; pedunculo dense hirtello petiolum superante, spica matura quam limbi dimidium paululo brevior longe mucronata mucrone filiformi villosa, rhachi hirsuta, bractea apice truncato-peltatae vertice triangulari postice acute producta et pilis duobus longis munita, pedicello angusto hirsuto, antheris ovatis filamenta superantibus, ovario libero glabro ovato-acuto, stigmatibus linearibus, bacca obpyramidato-trigona glabra.

Frutex humilis. Ramuli spiciferi usque ad 3 mm. crassi, collenchyma in fasciculos discretos a latere longe productos dispositum partim libriforme, fasciculi intramedullares 1-seriati, canalis lysigenus nullus. Limbi in sicco membranacei minutissime pellucido-punctulati, usque ad 19.5 cm. longi et 8.5 cm. lati. Petioli usque ad limbi latus longius circiter 6 mm. et inter limbi latera fere 2 mm. longi. Pedunculi 16 mm. longi. Spicae maturae 7 cm. longae et 3 mm. crassae, mucro 1 cm. longus. Stamina 3 ad basin baccae rhachi inserta. Stigmata 3 sessilia. Bacca 1 mm. longa in sicco nigra asperulata.

PANAMA: Hills of Sperdi, near Puerto Obaldía, San Blas Coast, alt. 20-200 m., *H. Pittier* 4348.

*forma b.* Limbo minore usque ad 17 cm. longo et 7 cm. lato.

PANAMA: High hills back of Puerto Obaldía, alt. 50-200 m., *H. Pittier* 4301.

#### PIPER CHIRIQUINUM C. DC., n. sp.

Ramulis glabris gracilibus; foliis modice petiolatis glabris, limbo ovato-lanceolato basi aequilatero acuto apice sat longe et obtuse acuminato, 7-plinervio nervo centrali fere a 1.5 cm. supra basin trifido nervis lateralibus adscendentibus utrinque 2 a basi solutis, petiolo basi ima vaginante; pedunculo glabro quam petiolus fere duplo brevior, spica submatura quam limbus paululo brevior apice subacuta, rhachi pilosa; bractea pelta triangulari glabra, pedicello angusto piloso, antheris parvis rotundatis quam filamenta brevioribus, ovario libero glabro, stigmatibus linearibus.

Ramuli spiciferi 1 mm. crassi in sicco pallidi, collenchyma libriforme in fasciculos discretos dispositum, fasciculi intramedullares 1-seriati, canalis lysigenus nullus. Limbi in sicco membranacei minutissime pellucido-punctulati, 10 cm. longi, 3.5 cm. lati. Petioli 12 mm., pedunculi 6 mm. longi. Spicae submaturae 6.5 cm. longae paululo sub 2 mm. crassae. Stamina 3 basi ima baccae adnata, antherae fere 0.25 mm. longae. Stigmata 3 sessilia.

PANAMA: Pastures around El Boquete, Chiriquí, alt. 1,000-1,300 m., *H. Pittier* 2930.

*forma* b. Limbo paullo majore usque ad 11 cm. longo et 4 cm. lato, spica submatura 7.5 cm. longa. Frutex circiter 2 m. altus.

PANAMA: Forests along Río Ladrillo and vicinity, above El Boquete, Chiriquí, alt. 1,000-1,300 m., *W. R. Maxon* 5557 (type), 5558; *H. Pittier* 4944.

PIPER HIRTELLIPETIOLUM C. DC., n. sp.

Ramulis primum parce hirtellis cito glabris; foliis breviter petiolatis, limbo oblongo-elliptico-lanceolato basi leviter inaequilatera utrinque acuto apice acute et sat longe acuminato supra subtusque glabro, nervo centrali nervos adscendentes utrinque 3-4 mittente quorum supremus a  $\frac{1}{4}$ - $\frac{1}{2}$  longitudinis centralis solutus, petiolo parce hirtello basi ima vaginante; pedunculo glabro petiolum aequante, spica matura limbi dimidium subaequante apice obtusa, rhachi hirsuta, bracteae pelta triangulari margine pedicelloque angusto dense et longe hirsutis, antheris rotundato-reniformibus filamenta oblonga paullo superantibus, ovario libero glabro, stigmatibus linearibus, bacca subtetragona glabra.

Ramuli spiciferi 2 mm. crassi, collenchyma in fasciculos discretos dispositum et zona interna libriforme, fasculi intramedullares 1-seriati, canalis lysigenus nullus. Limbi in sicco membranacei creberrime pellucido-punctulati, usque ad 12.3 cm. longi et 3.4 cm. lati. Petioli usque ad latus longius fere 5 mm., inter limbi latera 2 mm., pedunculi 7 mm. longi. Spica matura circiter 4.5 cm. longa et 3 mm. crassa, stamina 3 basi ima baccae adnata, bacca in sicca nigra, stigmata 3 sessilia.

PANAMA: Along streamlet, vicinity of David, Chiriquí, alt. 30-80 m., *H. Pittier* 2932.

PIPER PALMASANUM C. DC., n. sp.

Ramulis glabris; foliis modice petiolatis, limbo oblongo-ovato basi leviter inaequilatera rotundato apice acute et sat longe acuminato, supra glabro subtus ad nervos nervulosque hirtello, nervo centrali nervos utrinque 4 mittente quorum superi 3 adscendentes quorum supremus circiter a 4 cm. supra basin et infimis fere a basi soluti, petiolo primum puberulo et cito glabro paullo infra medium vaginante, pedunculo petiolum aequante puberulo, spica sub anthesi quam limbus pluries brevior mucronulata, bracteae pelta triangulari in

medio carnosae et umbonatae, margine pedicelloque angusto dense et sat longe hirsutis, antheris rotundatis, ovario libero glabro.

Frutex. Ramuli spiciferi 1 mm. crassi, collenchyma in fasciculos discretos dispositum et zona interna libriforme, fasciculi intramedullares 1-seriati, canalis lysigenus nullus. Limbi in sicco membranacei creberrime pellucido-punctulati obscure virescentes, superi 10.4 cm. longi et usque ad 4.5 cm. lati, subsequentes basi aequilateri usque ad 15 cm. longi et 5.7 cm. lati. Petioli superi usque ad limbi latus longius circiter 7 mm., inter limbi latera paululo ultra 1 mm. longi. Spica adhuc juvenilis 1.7 cm. longa, 2 mm. crassa in sicco canescens. Stamina 3.

PANAMA: Humid forest of Cuesta de las Palmas, southern slope of Cerro de la Horqueta, Chiriquí, alt. 1,700-2,100 m., *H. Pittier* 3225.

**PIPER TABOGANUM C. DC., n. sp.**

Ramulis villosulis; foliis modice petiolatis, limbo elliptico-oblongo basi inaequilatera altero latere rotundato altero subrotundato subacutove apice acute attenuato utrinque hirtello, nervo centrali nervos altero latere 5 altero 6 mittente quorum supremus a fere 6 cm. supra basin solutis, superi 5 adscendentes, infimus brevissimus subadscendens arcuatus, petiolo dense hirtello paulo ultra basin vaginante; pedunculo parce hirtello petiolum fere aequante, spica matura quam limbus paulo brevior apice subacuta, rhachi hirsuta, bractee pelta triangulari margine pedicelloque dense hirsutis, ovario libero ovato puberulo, bacca obpyramidato-trigona glabra, stigmatibus minutis.

Ramuli spiciferi usque ad 2 mm. crassi in sicco nigrescentes, collenchyma continuum haud libriforme, fasciculi intramedullares 1-seriati, canalis lysigenus nullus. Limbi in sicco membranacei minute pellucido-punctulati usque ad 11.5 cm. longi et 3.2 cm. lati. Petioli usque ad limbi latus longius 7 mm. inter limbi latera 4 mm. longi. Pedunculi 12 mm. longi. Spicae usque ad 9 cm. longae et 2 mm. crassae, in sicco nigrae, stamina 3 basi ima baccae adnata, antherae in specimine delapsae.

PANAMA: Taboga Island, Gulf of Panama, alt. 0-250 m., *H. Pittier* 3529.

**PIPER PERSUBULATUM C. DC., n. sp.**

Ramulis villosis; foliis breviter petiolatis, limbo ovato-oblongo basi aequilatera utrinque subrotundato apice longissime subulato, utrinque et subtus densius villosa, nervo centrali nervos utrinque 7 mittente quorum infimi 2 subadscendentes quam alii adscendentes

multo breviores, supremus ex  $\frac{1}{2}$  longitudinis solutus, petiolo villosa basi ima vaginante; pedunculo villosa petiolum aequante, spica florante limbi dimidium subaequante apice acuta, bractee pelta triangulari antice acuta margine pedicelloque angusto villosis, antheris rotundato-ovatis filamenta oblonga fere aequantibus, ovario libero glabro, stigmatibus linearibus.

Ramuli spiciferi 2 mm. crassi pilosi, collenchyma continuum zona interna interrupte libriforme, fasciculi intramedullares 1-seriati, canalis lysigenus nullus. Limbi in sicco membranacei epunctulati 21-24 cm. longi, 6-8.5 cm. lati, acumen 2.5 cm. longum. Petioli usque ad 5 mm. longi. Spica florens fere 10 cm. longa usque ad 2 mm. crassa. Stamina 3 basi ima ovarii adnata, ovarium ad rhachi elongatum. Stigmata 3 sessilia.

PANAMA: Loma de la Gloria, near Fató (Nombre de Dios), Province of Colón, alt. 10-104 m., *H. Pittier* 4240.

#### PIPER LATIBRACTEUM C. DC., n. sp.

Ramulis glabris; foliis modice petiolatis, limbo ample oblongo-ovato basi ima levissime inaequilatera obtuso apice breviter et obtusiuscule acuminato, supra glabro subtus ad nervos velutine puberulo nervo centrali nervos subadscendentes arcuatos utrinque circiter 13 fere ex  $\frac{3}{4}$  longitudinis suae mittente, petiolo glabro usque ad limbum vaginante; pedunculo glabro quam petiolus multo brevior, spica quam limbus pluries brevior petiolum paulo superante apice mucronata, bractee apice truncato-peltatae vertice late triangulari parte infera lata et dense hirtella, antheris rotundato-ovatis filamenta oblonga fere aequantibus, ovario rhachi profunde immerso superne libero conoideo ac carnosio et glabro, stigmatibus 2 linearibus lateralibus.

Ramuli spiciferi 3 mm. crassi, collenchyma in fasciculos discretos dispositum et haud libriforme, fasciculi intramedullares 1-seriati, canalis lysigenus nullus. Limbi in sicco membranacei minute pellucido-punctulati, 21 cm. longi, 11-12 cm. lati. Petioli usque ad limbi latus longius 15 mm., inter limbi latera 1 mm. longi. Pedunculi fere 9 mm. longi. Spica matura usque ad 3 cm. longa et 8 mm. crassa; bractea apice fere 1.5 mm. lata. Stamina 4.

PANAMA: Boca de Pauarandó, on Sambú River, southern Darién, alt. 20 m., *H. Pittier* 5588.

#### PIPER PUBISTIPULUM C. DC., n. sp.

Ramulis dense hirsutis; foliis breviter petiolatis, limbo ovato-oblongo basi inaequilatera utrinque rotundato et semicordulato apice acutiuscule et sat longe acuminato, supra glabro subtus hirsuto, nervo

centrali nervos altero latere 6 altero 5 mittente quorum superi utrinque 4-5 adscendentes infimi fere e basi divaricantes supremusque fere a 8 cm. supra basin solutus, petiolo dense hirsuto usque ad limbum vaginante; pedunculo hirsuto quam petiolus multo brevior, spica quam limbus pluries brevior sat crassa et apice mucronata, rhachi glabra, bractee glabrae vertice truncato-peltato triangulari pedicello sat lato supra concavo, antheris globosis filamenta aequantibus, ovario inferne rhachi immerso, superne libero et in stilum oblongum apice lateraliter bilobatum producto.

Frutex 1 m. altus. Ramuli spiciferi 2 mm. crassi, collenchyma libriforme in fasciculos discretos dispositum fasciculi intramedullares 1-seriati, canalis lysigenus nullus. Limbi in sicco minute pellucido-punctulati 17 cm. longi, 5 cm. lati. Stipulae extus hirtellae. Petioli usque ad limbi latus longius 8 mm., inter limbi latera 2 mm. longi. Pedunculi 5 mm. longi. Spicae florentes 1.7 cm. longae, 4 mm. crassae. Stamina 4.

PANAMA: Hills around the Agua Clara Reservoir, near Gatún, Canal Zone, alt. 20-30 m., *H. Pittier* 2661.

PIPER PORTOBELLEENSE C. DC., n. sp.

Ramulis glabris emergentiis munitis; foliis longe petiolatis, limbo ample ovato basi ima modice inaequilatera cordato lobis conniventibus apice acute acuminato, supra glabro subtus ad nervos nervulosque hirtello, nervo centrali nervos adscendentes utrinque 5 mittente quorum supremus fere a 2.2 cm. supra basin solutus, nervis lateralibus utrinque 3 a petiolo divaricantibus, petiolo usque ad limbum vaginante dorso hirsuto et emergentiis dense munito; pedunculo glabro laevi petioli dimidium superante, spica quam limbus multo brevior apice obtusa, bractee glabrae vertice truncato triangulari pedicello lato, bacca libera obovato-tetragona glabra.

Arbuscula 4 m. et plus alta. Ramuli spiciferi fere 5 mm. crassi, collenchyma continuum zona interna libriforme, fasciculi intramedullares 2-3-seriati, canalis lysigenus unicus centralis. Limbi in sicco firmi minutissime pellucido-punctulati, 43 cm. longi et 25 cm. lati. Petioli 8.5 cm., pedunculi 6.5 cm. longi. Spica matura 17 cm. longa et fere usque ad 1 cm. crassa. Stamina 4 basi ima baccae adnata, bacca 1.5 mm. longa.—Species forma foliorum ac emergentiis *P. squamulosum* C. DC. sat referens sed pilis brevioribus, bractea glabra ab illo discrepans.

PANAMA: Around Porto Bello, Province of Colón, alt. 5-200 m., *W. R. Maxon* 5795.



## PIPER OBALDIANUM C. DC., n. sp.

Ramulis hirsutis; foliis modice petiolatis, limbo ovato-acuminato basi inaequilatera utrinque rotundato, apice acute acuminato, utrinque dense et breviter hirsuto, nervo centrali nervos altero latere 5 altero 6 mittente, quorum supremus a 5 cm. supra basin solutus et superi 5 adscendentes, petiolo dense hirsuto usque ad medium vaginante; pedunculo hirsuto quam petiolus multo brevior, spica limbi dimidium subaequante, bractee pelta triangulari pedicelloque angusto margine hirsutis, antheris rotundatis quam filamenta brevioribus, bacca obpyramidato-trigona, stigmatibus linearibus.

Ramuli spiciferi 3 mm. crassi, collenchyma continuum zona interna libriforme, fasciculi intramedullares 1-seriati, canalis lysigenus nullus. Limbi in sicco membranacei, minute pellucido-punctulati, supra haud bullati nec scabri, usque ad 14.5 cm. longi et 7 cm. lati. Petioli usque ad limbi latus longius 10 mm., inter limbi latera 5 mm., pedunculi 6 mm. longi. Spica matura 5 cm. longa et 5 mm. crassa. Stamina 4. Stigmata 3 sessilia, bacca in sicco nigra.

PANAMA: Forests around Puerto Obaldía, San Blas Coast, alt. 0-50 m., *H. Pittier* 4366.

PIPER DUMETICOLA C. DC.,  $\beta$  PANAMENSE C. DC., n. var.

Limbo oblongo-elliptico-lanceolato, basi et apice ut in specie, usque ad 12 cm. longo et fere 4 cm. lato, collenchymate in fasciculos discretos a latere valde productos disposito et zona interna libriformi.

PANAMA: Vicinity of Olá, Province of Coclé, alt. 100-350 m., *H. Pittier* 5034 (type). Sabana de Juan Corso, near Chepo, Province of Panama, alt. 60-80 m., *Pittier* 4539. Dry forests on limestone formation around Alhajuela, Chagres Valley, *Pittier* 3445.

## PIPER FATOANUM C. DC., n. sp.

Ramulis dense et breviter hirsutis; foliis modice petiolatis, limbo elliptico-subovato-lanceolato basi inaequilatera utrinque acuto vel altero latere subacuto, apice acute et sat longe acuminato, utrinque dense et breviter hirsuto, nervo centrali nervos adscendentes altero latere 5 altero 6 mittente quorum supremus fere a 7 cm. supra basin solutus, petiolo dense et breviter hirsuto fere usque ad medium vaginante; pedunculo hirsuto petiolum subaequante, spica matura limbi dimidium subaequante apice acuta, rhachi hirsuta, bractee pelta triangulari pedicelloque angusto margine hirsutis, antheris ovatis quam filamenta tenuia paullo brevioribus, ovario libero glabro, stigmatibus linearibus, bacca obpyramidato-trigona glabra.

Arbuscula vel frutex circiter 1.5 m. altus. Ramuli spiciferi 1.5 mm. crassi, collenchyma continuum zona interna interrupte libriforme, fasciculi intramedullares 1-seriati. Limbi in sicco membranacei minute pellucido-punctulati, usque ad 16 cm. longi et 4.8 cm. lati. Petioli usque ad limbi latus longius 7 mm., inter limbi latera 3 mm. longi. Spica matura 7-11.5 cm. longa et usque ad 4.5 mm. crassa. Stamina 4 rhachi inserta, bacca 1 mm. longa.

PANAMA: Along the beach between Fató and Playa de Damas, Province of Colón, *H. Pittier* 3935 (type). Around Gamboa, Canal Zone, in thickets, alt. 40-80 m., *Pittier* 3709.

**PIPER PALLIDIBRACTEUM C. DC., n. sp.**

Ramulis hirsutis; foliis modice petiolatis, limbo ample elliptico-lanceolato basi inaequilatera utrinque acuto apice obtuse acuminato, utrinque haud dense hirsuto, nervo centrali nervos adscendentes altero latere 5 altero 6 mittente quorum infimi aliis multo breviores supremusque paullo sub  $\frac{1}{2}$  longitudinis centralis solutus, petiolo hirsuto fere usque ad  $\frac{1}{3}$  longitudinis suae vaginante; pedunculo hirsuto quam petiolus paullo brevior, spica limbi dimidium subaequante mucronata, rhachi hirsuta, bractee pelta triangulari margine pedicelloque dense et pallide hirsutis, antheris rotundatis quam filamenta oblonga adulta multo brevioribus, bacca obpyramidato-trigona glabra, stigmatibus linearibus.

Ramuli spiciferi 3 mm. crassi, collenchyma continuum zona interna libriforme, fasciculi intramedullares 1-seriati, canalis lysigenus nullus. Limbi in sicco membranacei minutissime pellucido-punctulati, haud scabri nec bullati, usque ad 19.5 cm. longi et fere 7 cm. lati. Petioli usque ad limbi latus longius fere 10 mm., inter limbi latera 3 mm. longi. Pedunculi 10 mm. longi. Spica circiter 10.5 cm. longa et 2 mm. crassa. Stamina 4 rhachi inserta, bacca in sicco nigra.

PANAMA: Forests around Puerto Obaldía, San Blas Coast, alt. 0-50 m., *H. Pittier* 4396 (type). Río Indio de Fató, Province of Colón, near sea level, *Pittier* 4271.

**PIPER ADUNCUM L.,  $\gamma$  LAEVIFOLIUM C. DC., n. var.**

Limbo adulto basi tantum ad nervum centralem et parce hirtello, usque ad 16.2 cm. longo et 5.9 cm. lato.

PANAMA: Forests around Porto Bello, Province of Colón, alt. 5-10 m., at edge of forest, *H. Pittier* 2438.

## PIPER PERACUMINATUM C. DC., n. sp.

Ramulis dense villosis; foliis breviter petiolatis, limbo ample oblongo-elliptico basi inaequilatera cordulato apice longissime et acute acuminato, supra praesertim ad nervos subtus densius villosus, nervo centrali nervos utrinque 5 mittente quorum supremus a 7 cm. supra basin solutus, superi adscendentes, inferi altero latere 2 altero 3 aliis multo breviores, petiolo dense villosus usque ad limbi latus longius vaginante; pedunculo villosus petiolum superante, spica submatura limbi dimidium paullo superante apice mucronulata, rhachi hirtella, bracteae pelta lunulata margine pedicelloque angusto dense et sat longa villosis, antheris ovatis quam filamenta oblonga brevioribus, bacca libera matura tetragona vertice dense puberula, stigmatibus linearibus.

Arbuscula. Ramuli spiciferi usque ad 4 mm. crassi, pili longi, collenchyma continuum zona interna libriforme, fasciculi intramedullares 1-seriati, canalis lysigenus nullus. Limbi in sicco firme membranacei crebre pellucido-punctulati, usque ad 22.5 cm. longi et 11 cm. lati. Petioli usque ad limbi latus longius 10 mm., inter limbi latera fere 2 mm., pedunculi 24 mm. longi. Spicae circiter 13 cm. longae et usque ad 5 mm. crassae. Stamina 4. Stigmata 3 sessilia.

PANAMA: Around Dos Bocas, Río Fató Valley, Province of Colón, alt. 40-80 m., in dense forest, *H. Pittier* 4210 (type). Río Indio de Fató, in shady woods, *Pittier* 4254.

## PIPER DAVIDIANUM C. DC., n. sp.

Ramulis glabris; foliis modice petiolatis glabris, limbo ample elliptico-lanceolato basi inaequilatera altero latere rotundato altero acuto, apice acute acuminato, nervo centrali nervos adscendentes altero latere 5 altero 6 mittente quorum supremus fere a medio centralis solutus, petiolo basi ima vaginante; pedunculo glabro petiolum aequante; spica matura limbi dimidium fere aequante apice obtusa, rhachi glabra, bracteae pelta triangulari margine hirtella pedicello angusto parce hirtello, antheris rotundatis quam filamenta oblonga brevioribus, stigmatibus linearibus, bacca libera tetragona glabra.

Frutex 2 m. altus. Ramuli spiciferi usque ad 3 mm. crassi, collenchyma in fasciculos discretos dispositum zona interna libriforme, fasciculi intramedullares 1-seriati. Limbi in sicco membranacei pellucido-punctulati, 18-19 cm. longi, 7.5-8 cm. lati. Petioli usque ad limbi latus longius 7 mm., inter limbi latera 4 mm. longi. Spica matura 8.5 cm. longa et 3 mm. crassa. Stamina 4 paullo supra basin baccae inserta. Stigmata 3 sessilia.

PANAMA: Vicinity of David, Chiriquí, alt. 30-80 m., along streamlet, *H. Pittier* 2837.

**PIPER LUCIGAUDENS C. DC., n. sp.**

Ramulis hirsutis; foliis breviter petiolatis, limbo elliptico-lanceolato a nervo centrali sat inaequilatero basi inaequilatera altero latere subrotundato altero acuto, apice acute et longe acuminato, supra glabro subtus praesertim ad nervos hirsuto, nervo centrali nervos ascendentibus altero latere 5 altero 6 mittente quorum supremus fere ex  $\frac{1}{2}$  longitudinis centralis solutus, petiolo hirsuto basi ima vaginante; pedunculo puberulo quam petiolus paullo brevior, spica subflorente quam limbi dimidium paullo brevior apice mucronulata, rhachi puberula, bractee pelta triangulari margine pedicelloque angusto hirtellis, antheris reniformibus, ovario glabro.

Arbor 3-4 m. alta. Ramuli spiciferi 1.5 mm. crassi, collenchyma in fasciculos discretos dispositum zona interna libriforme, fasciculi intramedullares 1-seriati, canalis lysigenus nullus. Limbi in sicco membranacei creberrime pellucido-punctati, usque ad 17.5 cm. longi, in medio altero latere a nervo centrali 3.3 cm. altero 2.5 cm. lati. Petioli usque ad limbi latus longius 5 mm., inter limbi latera 4 mm., pedunculi circiter 7 mm. longi. Spicae subflorentes circiter 5.5 cm. longae et usque ad 2 mm. crassae. Stamina 4. Stigmata 3.

PANAMA: Forest along the Río Indio de Gatún, Canal Zone, near sea level, in sunny second growth, *H. Pittier* 2791 p. p.

**PIPER ERECTAMENTUM C. DC., n. sp.**

Ramulis dense hirsutis; foliis breviter petiolatis, limbo ovato-acuminato basi ima leviter inaequilatera utrinque rotundato, apice acute et longe acuminato, supra glabro subtus ad nervos dense et adpresse hirsuto, nervo centrali nervos utrinque 5 mittente quorum supremus ex fere  $\frac{1}{3}$  longitudinis centralis solutus superi ascendentibus infimi subascendentibus, petiolo hirsuto basi ima vaginante; pedunculo fere glabro petiolum subaequante, spica florente quam limbi dimidium paullo brevior mucronata, rhachi hirsuta, bractee pelta triangulari margine pedicelloque subaequilato hirsutis, antheris reniformibus quam filamenta oblonga latiuscula paullo brevioribus, ovario ovato superne hirsuto, stigmatibus oblongo-ovatis.

Ramuli spiciferi 2 mm. crassi, collenchyma continuum zona interna libriforme, fasciculi intramedullares 2-seriati, cellulae rubrae in cortice et in medulla creberrimae, canalis lysigenus nullus. Limbi in sicco membranacei crebre pellucido-punctulati, usque ad 17 cm. longi et 7.7 cm. lati. Petioli usque ad limbi latus longius 7 mm., inter limbi latera 2 mm., pedunculi 8 mm. longi. Spica florens 7 cm. longa, usque

ad 3 mm. crassa, in vivo erecta. Stamina 4 supra basin ovarii inserta. Stigmata 3 sessilia. Ovarii parietes cellulis rubris farctae.

PANAMA: Humid forests around Los Sigüas Camp, southern slope of Cerro de la Horqueta, Chiriquí, alt. about 1,700 m., *H. Pittier* 3191.

**PIPER COLONENSE C. DC., n. sp.**

Ramulis puberulis; foliis breviter petiolatis, limbo ample oblongo-elliptico basi inaequilatera utrinque rotundato, apice acute acuminato, supra ad nervum centram puberulo subtus ad nervos minute puberulo, nervo centrali nervos utrinque 6 mittente quorum supremus a 10-11 cm. supra basin solutus, superi 4 adscendentes, infimus patule subadscendens et aliis magis arcuatus, petiolo minutissime puberulo usque ad limbi latus longius vaginante; pedunculo minutissime puberulo petiolum fere aequante, spica florente quam limbus fere triplo brevior apice obtusa, rhachi glabra, bractee pelta triangulari margine pedicelloque angusto dense villosis, antheris reniformibus connectivo inferne obconico sat longe producto filamenta oblonga paullo superantibus, ovario glabro ovato-acuto, stigmatibus linearibus.

Frutex 2.5 m. altus. Ramuli spiciferi usque ad 4 mm. crassi, colenchyma continuum zona interna libriforme, fasciculi intramedullares 1-seriati, canalis lysigenus nullus. Limbi in sicco firme membranacei creberrime pellucido-punctulati, usque ad 30 cm. longi et 11.5 cm. lati. Petioli usque ad limbi latus longius 15 mm., inter limbi latera 5 mm. longi. Spica florens 9.5 cm. longa, usque ad 3 mm. crassa. Stamina 4 basi ima baccae adnata.

PANAMA: Around Dos Bocas, Río Fató Valley, Province of Colón, alt. 40-80 m., in dark forest, *H. Pittier* 4221.

**PIPER VILLIRAMULUM C. DC., n. sp.**

Ramulis junioribus villosis cito glabris; foliis modice petiolatis, limbo ovato-acuminato basi inaequilatera altero latere rotundato altero subrotundato, apice acute et sat longe acuminato, utrinque dense hirsuto et supra scabrido, a nervo centrali distincte inaequilatero, nervo centrali nervos altero latere 7 altero 8 mittente, quorum superi utrinque 4 adscendentes, inferi 2-3 patule subadscendentes aliis multo breviores et tenuiores, supremus fere a medio centralis solutus, petiolo dense hirsuto basi ima vaginante; pedunculo hirsuto quam petiolus paullo brevior, spica submatura quam limbi dimidium paullo brevior obtusa, rhachi glabra, bractee pelta triangulari margine pedicelloque angusto hirtellis, antheris rotundatis quam filamenta oblonga paullo brevioribus, ovario glabro, stigmatibus linearibus, bacca tetragona glabra.

Arbuscula. Ramuli in sicco flavicantes, spiciferi usque ad 4 mm. crassi, collenchyma in fasciculos discretos dispositum et zona interna libriforme, fasciculi intramedullares 1-seriati, canalis lysigenus nullus. Limbi in sicco membranacei virides minute pellucido-punctulati, usque ad 17 cm. longi et 7.8 cm. lati, stipulae villosae. Petioli usque ad limbi latus longius 6 mm., inter limbi latera fere 2 mm., pedunculi 7 mm. longi. Spica submatura 8 cm. longa fere 2.5 mm. crassa. Stamina 4 basi ima baccae adnata, bacca 0.5 mm. longa. Stigmata 3 sessilia cito decidua.

PANAMA: Loma de la Gloria near Fató (Nombre de Dios), Province of Colón, in forests, alt. 10-104 m., *H. Pittier* 4083 (type). Sabana de Juan Corso, near Chepo, Province of Panama, alt. 60-80 m., *Pittier* 4537.

**PIPER HISPIDUM Sw., var. GAMBOANUM C. DC., n. var.**

Limbo ovato-acuminato, basi fere aequilatera utrinque rotundato apice acute acuminato, subtus ubique hirsuto, usque ad 8.5 cm. longo et 3.3 cm. lato; pedunculo quam petiolus paullo brevior.

PANAMA: Around Gamboa, Canal Zone, alt. 20-100 m., *H. Pittier* 3410.

**PIPER TENUIMUCRONATUM C. DC., n. sp.**

Ramulis glabris tenuibus; foliis modice petiolatis glabris, limbo elliptico-lanceolato basi leviter inaequilatera utrinque acuto, apice longe acuminato subulatoque, nervo centrali nervos adscendentes tenues altero latere 3 altero 4 mittente, quorum supremus a circiter 3.5 cm. supra basin solutus, petiolo glabro basi ima vaginante; pedunculo glabro petiolum superante, spica florente limbi dimidium aequante apice tenuiter mucronata, rhachi parce pilosa, bractee vertice truncato-lunulato margine pedicelloque flavide hirtellis, antheris ovatis filamenta tenuia fere aequantibus, ovario glabro, stigmatibus linearibus.

Frutex 2 m. altus. Ramuli spiciferi 1 mm. crassi, collenchyma in fasciculos discretos dispositum et zona interna libriforme, fasciculi intramedullares 1-seriati, canalis lysigenus nullus. Limbi in sicco membranacei creberrime pellucido-punctulati usque ad 10 cm. longi et 4.4 cm. lati. Petioli usque ad limbi latus longius 7 mm., inter limbi latera vix 2 mm., pedunculi 23 mm. longi. Spicae florentes 5 cm. longae, 2 mm. crassae. Stamina 5, antherae 0.5 mm. longae. Bacca verisimiliter tetragona.

PANAMA: Humid forest around Los Sigüas Camp, southern slope of Cerro de la Horqueta, Chiriquí, alt. about 1,700 m., *W. R. Maxon* 5421 (type); *H. Pittier* 3185. Forests along the Río Ladrillo and vicinity, above El Boquete, Chiriquí, alt. 1,200-1,300 m., *Maxon* 5395.

**PIPER CHAMISSONIS** Steud.,  $\beta$  **RUBELLIBRACTEUM** C. DC., n. var.

Limbo usque ad 17 cm. longo et 6.2 cm. lato, bractea rubelle punctata, bacca vertice velutina.

PANAMA: Forests around El Boquete, Chiriquí, alt. 1,000-1,300 m., *H. Pittier* 2899.

**PIPER SAMBUANUM** C. DC., n. sp.

Ramulis glabris; foliis brevissime petiolatis glabris, limbo elliptico-lanceolato basi ima leviter inaequilatera utrinque acuto subacutove, apice obtuse et sat longe acuminato, nervo centrali nervos adscendentes utrinque 5 mittente quorum infimus aliis multo brevior et tenuior, supremus circiter a medio centralis solutus, petiolo basi ima vaginante; pedunculo glabro petiolum paullo superante, spica florente limbi dimidium fere aequante apice mucronulata, rhachi hirtella, bractea pelta triangulari margine pedicelloque angusto hirsutis, antheris rotundatis quam filamenta multo brevioribus, ovario glabro, stigmatibus linearibus.

Ramuli spiciferi 2 mm. crassi, collenchyma in fasciculos discretos dispositum, zona interna libriforme, fasciculi intramedullares 1-seriati, cellulae fuscescentes in cortice et in medulla creberrimae. Limbi in sicco firmi minute pellucido-punctulati, 15-16 cm. longi, 5-6.5 cm. lati. Petioli usque ad limbi latus longius 6 mm., inter limbi latere fere 2 mm., pedunculi 10 mm. longi. Spicae florentes 9 cm. longae et fere usque ad 2 mm. crassae. Stamina 4 basi ima baccæ adnata. Stigmata 3 sessilia.

PANAMA: Foothills of Garagará, Sambú Basin, southern Darién, alt. 30-500 m., *H. Pittier* 5663 (type), 5726.

**PIPER CALLIBRACTEUM** C. DC., n. sp.

Ramulis glabris albido-verruculosis; foliis modice petiolatis glabris, limbo ovato-lanceolato basi leviter inaequilatera utrinque acuto, apice acute et longe acuminato, nervo centrali nervos adscendentes utrinque 5 mittente quorum supremus fere a medio centralis solutus, petiolo basi ima vaginante albido-verruculoso; pedunculo glabro petiolum fere aequante, spica matura limbi dimidium superante apice mucronata rhachi glabra, bracteae pelta triangulari dorso in callum

obtusum glabrum producta marginibus pedicelloque angusto hirtellis, antheris reniformibus quam filamenta adulta paullo brevioribus, stigmatibus linearibus, bacca tetragona vertice velutino-puberula.

Ramuli spiciferi 2 mm. crassi, collenchyma in fasciculos discretos a latere productos dispositum haud libriforme, cellulae aurantiacae in cortice et in medulla crebrae, fasciculi intramedullares 1-seriati, canalis lysigenus nullus. Limbi in sicco firme membranacei crebre pellucido-punctulati, usque ad 16 cm. longi et 7.9 cm. lati. Petioli usque ad limbi latus longius 12 mm., inter limbi latera 2 mm., pedunculi fere 15 mm. longi. Spicae maturae fere 10.5 cm. longae et 3 mm. crassae. Stamina 4 basi ima baccae adnata, bacca 1 mm. longa.

PANAMA: Forests around El Boquete, Chiriquí, alt. 1,000-1,300 m., *H. Pittier* 2940.

**PIPER SUBNUDIBRACTEUM C. DC., n. sp.**

Ramulis glabris verruculosi; foliis breviter petiolatis, limbo elliptico-lanceolato basi inaequilatera utrinque acuto, apice acute et longe acuminato, supra glabro subtus ad nervos nervulosque piloso, nervo centrali nervos adscentes utrinque 5 mittente, quorum supremus fere a medio centralis solutus, petiolo glabro basi ima vaginante verruculoso; pedunculo glabro parce verruculoso petiolum superante gracili, spica subflorente quam limbi dimidium paullo brevior mucronulata, bractee pelta triangulari margine pedicelloque angusto minute hirtellis.

Ramuli spiciferi usque ad 2 mm. crassi, collenchyma in fasciculos discretos dispositum, zona interna libriforme, fasciculi intramedullares 1-seriati, canalis lysigenus nullus, cellulae rubescentes in medulla crebrae. Limbi in sicco membranacei creberrime pellucido-punctulati, usque ad 18 cm. longi et 6 cm. lati. Petioli usque ad limbi latus longius 5 mm., inter limbi latera 3 mm., pedunculi 13 mm. longi. Spica subfloreus 8 cm. longa 2 mm. crassa in sicco subfuscescens. Stamina 4.—Species *P. uspatanensi* C. DC. e Guatemala proxima, ramulis omnino glabris, bractee pelta subglabra limbo minore ab illo discrepans.

PANAMA: Between Cerro Vaca and Hato del Loro, eastern Chiriquí, alt. 850-1,000 m., *H. Pittier* 5390.

**PIPER NITIDIFOLIUM C. DC., n. sp.**

Ramulis glabris; foliis longiuscule petiolatis, limbo ovato-elliptico-lanceolato basi inaequilatera utrinque acuto, apice acute et longe acuminato, supra glabro subtus ad nervos adpresse hirtello, nervo



centrali nervos adscendentes utrinque 4 mittente, quorum supremus fere a medio centralis solutus petiolo glabro basi ima vaginante; pedunculo glabro quam petiolus brevior, spica florente limbi dimidium fere aequante apice mucronata, rhachi glabra, bracteae pelta lunulata margine pedicelloque angusto hirtellis, antheris reniformibus quam filamenta tenuia paullo brevioribus, ovario glabro, stigmatibus linearibus.

Frutex 2-3 m. altus. Ramuli spiciferi 3 mm. crassi, collenchyma continuum zona interna interrupte libriforme, fasciculi intramedullares 2-seriati, canalis lysigenus nullus. Limbi in vivo utrinque nitidi in sicco membranacei creberrime pellucido-punctulati, usque ad 21 cm. longi et 9 cm. lati. Petioli usque ad limbi latus longius usque ad 17 mm., inter limbi latera usque ad 6 mm., pedunculi 17 mm. longi. Spicae florentes 8.5 cm. longae 3 mm. crassae. Stamina 4 alte ovario inserta.—Species *P. epigynio* C. DC. e Costa Rica proxima, pilis multo brevioribus, pedunculo breviori, nervorum lateralium numero ab illo discrepans.

PANAMA: Vicinity of El Boquete, Chiriquí, alt. 1,000-1,300 m., in forest ravine, *W. R. Maxon* 4943.

**PIPER GARAGARANUM C. DC., n. sp.**

Ramulis dense villosis; foliis breviter petiolatis, limbo elliptico-lanceolato basi leviter inaequilatera utrinque acuto, apice acute attenuato, utrinque villosa, nervo centrali nervos adscendentes utrinque 4 mittente quorum supremus fere ex 5.5 cm. supra basin solutus, petiolo dense villosa basi vaginante; pedunculo villosa petiolum aequante, spica florente quam limbus pluries brevior apice obtuso, bractea rotundato-obovata superne inflexa extus glabra intus hirsuta, antheris rotundatis quam filamenta oblonga paullo brevioribus, ovario libero glabro ovato, stigmatibus rotundatis.

Ramuli spiciferi 2 mm. crassi, collenchyma in fasciculos discretos dispositum haud libriforme, fasciculi intramedullares 1-seriati, canalis lysigenus nullus. Limbi in sicco membranacei creberrime pellucido-punctulati, usque ad 17 cm. longi et 6.3 cm. lati. Petioli usque ad limbi latus longius circiter 4 mm., inter limbi latera fere 3 mm., pedunculi 6 mm. longi. Spicae florentes 1.7 cm. longae et 3 mm. crassae. Stamina 4 rhachi ad basin ovarii inserta.

PANAMA: Foothills of Garagará, Sambú Basin, southern Darién, alt. 30-500 m., *H. Pittier* 5618.

## PIPER MAXONII C. DC., n. sp.

Ramulis glabris; foliis peltatis sat longe petiolatis glabris, limbo 2.5 cm. supra basin peltato rotundato-ovato basi leviter inaequilatera sinuato-cordulato, apice breviter et acute acuminato, 13-plinervio nervo centrali nervos adscendentes utrinque 3 mittente quorum supremus a 6 cm. supra basin solutus, nervis lateralibus utrinque 3 a petiolo divaricantibus, petiolo usque ad limbum vaginante; pedunculo glabro petioli dimidium fere aequante spica florente quam limbus paullo brevior apice acuta rhachi glabra bracteae vertice truncato-peltato carnosio margine supero longe infero breviter hirsuto, pedicello oblongo glabro supra canaliculato, antheris ovatis quam filamenta longa et tenuia brevioribus, ovario basi in rhachi immerso glabro, stigmatibus brevibus.

Frutex 3 m. altus, ramuli spiciferi circiter 4 mm. crassi, collenchyma in fasciculos discretos et approximatos dispositum haud vel zona interna parce libriforme, canalis lysigenus nullus. Limbi in vivo supra obscure subtus pallide virescentes in sicco membranacei creberrime pellucido-punctulati, 23 cm. longi et usque ad 19.5 cm. lati. Petioli 7 cm. longi. Spicae florentes circiter 16 cm. longae et 4 mm. crassae. Stamina 4. Stigmata 3 sessilia.

PANAMA: Vicinity of El Boquete, alt. 1,000-1,300 m., wet wooded ravine, *W. R. Maxon* 5050 (type). Forests along the Río Ladrillo and vicinity, above El Boquete, Chiriquí, shady places between the Ladrillo and first hill, alt. 1,200-1,300 m., *H. Pittier* 3163; along the river, *H. Pittier* 3164.

## PIPER MAGNANTHERUM C. DC., n. sp.

Ramulis foliisque modice petiolatis glabris et creberrime rubescente-punctulatis, limbo elliptico-oblongo basi inaequilatera utrinque acuto, apice acute et sat longe attenuato, nervo centrali nervos adscendentes utrinque 4 mittente quorum supremus paullo infra medium centralis solutus, petiolo basi ima vaginante; pedunculo glabro quam petiolus multo brevior, spica florente quam limbus pluries et quam petiolus paullo brevior cylindrica apice mucronulata rhachi hirsuta, bracteae vertice truncato late triangulari margine pallide et dense hirsuto parte infera lata hirsuta, antheris magnis carnosissimis filamenta tenuia multo superantibus.

Ramuli spiciferi 1.75 mm. crassi, collenchyma in fasciculos discretos dispositum et haud libriforme, fasciculi intramedullares 1-seriati, cellulae fusciscentes magnae in cortice et in medulla cerebrae. Limbi in sicco membranacei 14.5 cm. longi et 4.5 cm. lati.

Petioli usque ad limbi latus longius 7-10 mm., inter limbi latera 7 mm. longi. Pedunculi tenues 8 mm. longi, spicae florentes 16 mm. longae et paullo ultra 2 mm. crassae, stamina 4, antherae paullo ultra 0.5 mm. longae.

PANAMA: Cerro de Garagará, Sambú Basin, southern Darién, alt. 500-794 m., *H. Pittier* 5666.