

may speak also of a quantum number of the grating, and that diffraction in various directions is given by different changes in that quantum number. This quantum number according to Duane is the momentum of the grating divided by h . Appealing as this picture of Duane's seems to be, it seems necessary to apply it only for phenomena of our complex atom within itself.

BOTANY.—*New Piperaceae from South America and Mexico.* WILLIAM TRELEASE, University of Illinois. (Communicated by E. P. KILLIP.)

Among specimens of South American and Mexican Piperaceae recently submitted to me by the United States National Museum for study the following new species and varieties were found:

***Piper austro-mexicanum*, sp. nov.**

A shrub?; twigs somewhat zig-zag; flowering internodes rather thick and short (3×15 – 30 mm.), granular-scrabrous and rather persistently upcurved-hirsute; leaves elliptic-oblong, subacuminate, rounded at base with one side somewhat shorter, moderate (4 – 5×12 – 15 cm.), pinnately nerved from below about the middle, the nerves about 6×2 , scabrous, the lower surface appressed-hairy, somewhat bullate in age; petiole short (scarcely $5 + 3$ mm.), upcurved-hirsute, not winged; spikes opposite the leaves, 3 – 4×50 – 60 mm.; peduncle scarcely 10 mm. long, gray-hirsute; bracts rounded-subpeltate, gray-ciliate; flowers sessile, perfect.

Type in the U. S. National Herbarium, no. 1,209,370, collected at Monserrate, Chiapas, southern Cordillera of Mexico, in 1925, by C. A. Purpus (no. 35).

***Piper eglandulosum*, sp. nov.**

A shrub?; glabrous; flowering internodes long and slender; leaves ovate-elliptic, caudate, equally or subunequally acute at base, 6.5 – 7×15 – 16 cm., pinnately nerved nearly throughout, the nerves some 10 – 12×2 , drying papery and glossy brown; petiole about 1 cm. long, winged at base; spikes opposite the leaves, 4 – 5×70 – 80 mm.; peduncle rather stout, 7 mm. long; bracts inconspicuous; flowers sessile, perfect.

Type in the U. S. National Herbarium, no. 1,230,811, collected at Carapas, Venezuela, alt. 1680 meters, by G. H. H. Tate (no. 14).

***Piper fenianum*, sp. nov.**

A shrub?; flowering internodes crisp-pubescent, rather slender and short (2 – 3 cm.); leaves elliptic-lanceolate, subacuminate, acute at base, small (2×4.5 – 4.5×7 cm.), palmately 5- or the larger obscurely 7-nerved, glabrous above, crisp-hairy beneath; petiole very short (scarcely 5 mm.) and slender, crisp-pubescent; spikes opposite the leaves, 2 – 3×60 – 75 mm.; peduncle crisp-hairy, short (scarcely 10 mm.); bracts subspatulate, ciliate and somewhat pubescent; flowers perfect, sessile; berries oblong-ovoid, sulcate, glabrous; stigmas 3, sessile.

Type in the U. S. National Herbarium, no. 1,209,377, collected at Hacienda Fenix, Chiapas, southern Sierra Madre, Mexico, in 1925, by C. A. Purpus (no. 386).

***Piper martensianum interior*, var. nov.**

A form with more lance-ovate leaves becoming $5-8 \times 13$ cm.

Type in the U. S. National Herbarium, no. 1,209,374, collected at Monserrate, Chiapas, southern Sierra Madre, Mexico, in 1925, by C. A. Purpus (no. 172). *Purpus* 143 is also this.

***Piper purpusianum*, sp. nov.**

A shrub?; glabrous; twigs zig-zag; flowering internodes rather slender, moderately elongated (3-4 cm.); leaves elongated-lanceolate, subfalcately attenuate, subequilaterally rounded below or acute at the very base, moderate ($3.5 \times 15-5 \times 21$ cm.), pinnately nerved from below the upper fourth, the strongly upcurved nerves $5-9 \times 2$, somewhat bullulate in age, paler beneath; petiole rather short (10-20 mm.), winged to the blade; spikes opposite the leaves, small (4×20 mm.), with sterile apex scarcely 1×10 mm.; peduncle slender and short (scarcely 10 mm.); bracts lunately concave, glabrous; flowers sessile, perfect.

Type in the U. S. National Herbarium, no. 1,209,376, collected at Hacienda Fenix, Chiapas, southern Sierra Madre, Mexico, in 1925, by C. A. Purpus (no. 196).

***Piper zarumanum*, sp. nov.**

A forking shrub, 2m. tall; flowering internodes rather slender and elongated, appressed- or crisp-pubescent; leaves lanceolate or lance-elliptic, somewhat acuminate, subacute at base, small (scarcely 1.75×5.5 cm.), pinnately or submultiple-nerved from below the middle, the nerves 4×2 , minutely appressed-pubescent or scabrid on both sides; petiole 3 mm. long, appressed-pubescent, winged at base; spikes opposite the leaves, $3 \times 30-50$ mm.; peduncle 7 mm. long, crisp-pubescent; bracts triangular-subpeltate, ciliate lacerate; flowers sessile, perfect; berries depressed-globose; stigmas 3, small, sessile.

Type in the U. S. National Herbarium, no. 1,196,222, collected between La Chorita and Portovelo (gold mine near Zaruma), Province Oro, Ecuador, alt. 1000-2000 meters, August 28, 1923, by A. S. Hitchcock (no. 21178).

***Peperomia carapasana*, sp. nov.**

A rather tall but slender and straggling glabrous herb; stem scarcely 2 cm. thick; leaves characteristically 3 at a node, lance-elliptic, gradually acute at both ends, moderately large ($2.5-4.5 \times 9.5-13$ cm.), 3- or obscurely 5-nerved, drying thin and translucent; petiole 10-15 mm. long, slender; spikes terminal, filiform ($2 \times 90-140$ mm.), densely flowered; peduncle 15 mm. long; bracts round-peltate; berries ovoid-acute with pseudo-cupule; stigma apical.

Type in the U. S. National Herbarium, no. 1,230,868, collected at Carapas, Venezuela, alt. 1680 meters, in 1925, by G. H. H. Tate (no. 114).

***Peperomia choritana* Trelease, sp. nov.**

A small essentially glabrous herb, repent on logs; stem slender (1 mm.); leaves alternate, round to elliptic, rounded at both ends or the longer acute

at base, 7×7 –12 mm., drying thick and yellowish with the simple midnerve evident beneath, somewhat revolute, minutely ciliolate upwards, obscurely pale-granular beneath; petiole scarcely 3 mm. long; spikes terminal, 1×40 –50 mm., somewhat openly subannularly flowered; peduncle filiform, 5–10 mm. long; bracts round-peltate; ovary ovoid, pointed; stigma subapical.

Type in the U. S. National Herbarium, no. 1,196,212, collected between La Chorita and Portovelo (gold mine near Zaruma), Province Oro, Ecuador, alt. 1000–2000 meters, August 28, 1923, by A. S. Hitchcock (no. 21162).

***Peperomia enantiostachya distachya*, var. nov.**

A slender repent and rooting form with ovate-acuminate leaves 2.5×5.5 cm., filiform petioles 1–2.5 cm. long, and very small spikes (in fruit scarcely 1×15 mm.) paired on a filiform 1-bracted common peduncle 2 cm. long, the individual peduncles scarcely half this length; berries ovoid, obliquely long-beaked, the stigma at base of the beak.

Type in the U. S. National Herbarium, no. 1,197 659, collected at Palmera, Río Pastaza, between Baños and Mera, Ecuador, alt. 1200 meters, in 1924, by G. H. H. Tate (no. 672).

***Peperomia omnicola oblanceolata*, var. nov.**

A moderate short-stemmed subsimple subprostrate herb; stem rather thick (4 mm.), crisp-pubescent; leaves alternate, oblong-oblanceolate, sharp-acuminate, acute at base, moderately large (5 – 6×15 –17 cm.), sparsely appressed-hairy above, crisp-pubescent beneath especially on the midrib, rather faintly pinnately nerved; petiole 1–2.5 cm. long, crisp-hairy; spikes 2–4 nearly sessile at each node of an open terminal panicle some 15×25 cm., filiform (1×100 –150 mm.); common peduncle (3–4 cm.) and axis of panicle softly crisp-pubescent; bracts round-peltate; ovary ovoid, impressed; stigma subapical.

Type in the U. S. National Herbarium, no. 1,197,654, collected at Palmera, Río Pastaza, between Baños and Mera, Ecuador, alt. 1200 meters, in 1924, by G. H. H. Tate (no. 667).

***Peperomia ppucu-ppucu*, sp. nov.**

A moderately small (subprostrate?) glabrous herb rooting from many nodes; leaves crowded, about 3 at a node, round-elliptic, rounded at both ends, often emarginulate, drying opaque and without evident nerves, about 10×10 mm.; petiole short (2 mm.); spikes terminal, about 2×6 mm. rather closely flowered with anastomosing ridges; peduncle short (5 mm.); bracts round-peltate, rather large; berries ovoid-attenuate, with pseudocupule; stigma apical.

Type in the U. S. National Herbarium, no. 1,231,071, collected at Ollantaytambo, Urubamba, Peru, alt. 2800 meters, in 1925, by F. L. Herrera (no. 802).

***Peperomia stelecephila glabrata*, var. nov.**

A moderately small repent herb, on logs, rooting from many nodes; stem rather slender (2–3 mm.), glabrous; leaves alternate, ovate, acuminate, peltate distinctly within the rounded base, 2.5×4.5 cm. (? or larger), dull, leathery, obscurely multiple-nerved, appressed-hairy around the margin; petiole 3 cm. long, glabrous; spikes axillary (? or also terminating lateral

branches), $3 \times 80-90$ mm., closely subannularly flowered; peduncle 25 mm. long, bracted near the middle; bracts round-peltate; berries oblong, truncate with stout spreading beak; stigma on the truncated apex.

Type in the U. S. National Herbarium, no. 1,196,573, collected between Baños and Cashurco, Valley of Río Pastaza, Province Tungurahua, Ecuador, alt. 1300-1800 meters, September 25, 1923, by A. S. Hitchcock (no. 21886).

***Peperomia subanomala*, sp. nov.**

A rather small erect branching herb; stem slender (1-2 mm.) rather long-hairy but glabrescent except about the nodes; leaves opposite, elliptic, subacute at both ends, rather small ($7 \times 14-10 \times 20$ mm.), slightly pubescent on the nerves above, somewhat revolute, densely long-hairy beneath, obscurely 3-nerved, firm and opaque; petiole short (2 mm.), hairy or subglabrescent; spikes terminal and axillary, moderately small (1×30 mm.), rather closely flowered; peduncle 5 mm. long, glabrous; bracts round-peltate; ovary ovoid, impressed; stigma subapical.

Type in the U. S. National Herbarium, no. 1,197,533, collected at Ambato, Province Tungurahua, Ecuador, alt. 2500 meters, in 1924, by G. H. H. Tate (no. 542).

***Peperomia subconcava*, sp. nov.**

A moderately small more or less cespitose simple erect arboricolous herb; stem rather slender (scarcely 2 mm.), at first puberulent or glabrous; leaves about 3 at a node, round-elliptic or obovate, rounded at both ends or the base subacute, very fleshy, drying thick with hyaline margin and not obviously nerved, $10 \times 10-15$ mm., somewhat pubescent to quite glabrous; petiole short (3 mm.) and thick, granular-puberulent or glabrous; inflorescence unknown.

Type in the U. S. National Herbarium, no. 1,196,467, collected between Cuenca and Huigra, Provinces Azuay and Cañar, Ecuador, alt. 2700-3000 meters, September 12-13, 1923, by A. S. Hitchcock (no. 21686).

***Peperomia tequendamana*, sp. nov.**

An ascending moderately small more or less branched herb; stem moderate (2-3 mm.) with short internodes, rusty crisp-villous; leaves alternate (? exceptionally opposite), broadly elliptic or ovate-elliptic, obtuse at both ends or abruptly blunt-acuminate, moderate ($1.5 \times 2-2 \times 4$ cm.), 5-nerved, appressed-hairy on both faces, granular beneath; petiole very short (2 mm.), hairy; spikes terminal and axillary, 2×60 mm., rather loosely subverticillately flowered; peduncle about 10 mm. long, from sparsely crisp-pubescent glabrescent; bracts round-peltate; ovary impressed, ovoid, obtuse; stigma subapical.

Type in the U. S. National Herbarium, no. 1,198,754, collected at Tequendama Falls, near Bogotá, Dept. Cundinamarca, Colombia, September 1909, by Brother Ariste Joseph (no. B-92).

BOTANY.—On *Gyrantthera* and *Bombacopsis*, with a key to the American genera of Bombacaceae. H. PITTIER, Caracas, Venezuela.

In his recent revision of the *Bombacaceae*,¹ Mr. R. C. Bakhuizen van den Brink has confessed himself unable to place my genus *Gyran-*

¹ *Revisio Bombacacearum*, in Bull. Jard. Bot. Buitenzorg, Ser. III, 6: 161-232; pl. 26-38. 1924.



Trelease, William. 1926. "New Piperaceae from South America and Mexico." *Journal of the Washington Academy of Sciences* 16, 204–207.

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