

NOTES ON NEW WORLD ZINGIBERACEAE: III\*  
Some new species in *Renealmia*

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ABSTRACT. The treatment of *Renealmia* in *Flora Neotropica* is supplemented with the inclusion of *R. foliifera* Standley and four new species: *R. cylindrica*, *R. pirrensis*, *R. purpurea* and *R. variegata*.

Since the publication of the systematic treatment of the genus *Renealmia* by P. J. M. Maas in *Flora Neotropica, Monograph No. 18* (1977), many collections made in Tropical America have been sent to Utrecht. Amongst them we recognized several additional species, five of which are described and depicted here. The plates are by Miss R. M. Smith (Royal Botanic Garden, Edinburgh) who's very kind offer to prepare them we gratefully accepted.

The numerical sequence of the species follows that used in the *Flora Neotropica* account.

[54.] *Renealmia pirrensis* Maas & Maas, **sp. nov.** Fig. 1.

Syn.: *Renealmia* spec A in P. Maas, *Flora Neotropica* 18: 144 (1977).

Ab omnibus speciebus differt ligula longa (2-6 mm), vagina striata laminaque sessili facie inferiora pilis malpighiaceis vestita.

Plants to 1.5 m tall. Rhizomes c. 10 mm thick, sometimes supported on slender stiltroots. Sheaths striate, 5-15 mm wide, rather to very densely covered with furcate to (stellate-)plurifurcate and/or compass-needle hairs (0.1-0.6 mm wide). Ligule 2-6 mm long, rather to very densely covered with compass-needle hairs, furcate hairs, and especially at the apex with needle-like hairs (0.2-0.5 mm long). Petiole 0-15 mm long, hairy like the sheaths. Lamina narrowly elliptic to narrowly obovate, acute to shortly acuminate at the apex (acumen to 15 mm long), cuneate at the base, 13-34 cm long, 4-8 cm wide, upper side glabrous except for some scattered, needle-like hairs along the midrib, lower side to densely covered with compass-needle hairs (0.1-0.4 mm wide). Scape erect, 13-20 cm tall, 2-4 mm thick, beset with sheaths up to 5 cm long and 1.1 cm wide. Inflorescence a basal thyrse 5-11.5 cm long and 1.5-4.5 cm wide, with 2-4-flowered cincinni. Indumentum of inflorescence: sheaths, rhachis, bracts, peduncles, bracteoles, pedicels, calyx, ovary, and capsule to very densely covered with plurifurcate (-stellate), furcate, and/or compass-needle hairs (0.1-0.6 mm wide). Bracts red, finally deciduous, (narrowly) ovate to (narrowly) elliptic, obtuse (to acute), 10-22 mm long, 6.5-15 mm wide. Peduncles 2-8 mm long. Bracteole 7-13 mm long. Pedicels 1-3 mm long. Calyx red, tubular (to turbinate),

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6–8 mm long, 3.5–6 mm wide, the lobes deltate to (very) depressed ovate, 1–3 mm long, 2–5 mm wide. Corolla yellow, to 11 mm long. The following measurements are made of buds: Corolla 5.5–6 mm long, tube 1.5–2 mm long, lobes 4 mm long, the dorsal one 2–3.5 mm wide, the two lateral ones 1–2.5 mm wide. Labellum 5.5 mm long and 4 mm wide when spread out, glabrous, (the limb horizontally spreading?), 3.5 mm long and 4 mm wide, middle lobe entire, lateral lobes rounded, basal claw 2 mm long and 1.5 mm wide, lateral staminodes to 1 mm long. Anther, style, and nectarial glands unknown. Ovary ellipsoid. Capsule red (?), ellipsoid to globose, 4–6 mm diam., its wall 0.1–0.2 mm thick when dry, 3–4-seeded, seeds 3–4 × 2–4 mm. Type: Panama, Darién, Cerro Pirre, ridge top near Rancho Plastico, 1200 m, 10–20 vii 1977, c.fl., *Folsom* 4277 (holo. MO).

Distribution: Panama, restricted to the Cerro Pirre region; in cloud forests, 1200–1550 m alt.

PANAMA: Darién: Cerro Pirre, 27 vii 1976, *Croat* 37864 (MO), x 1962, *Duke* 6109 (GH, MO, US), 14 xii 1962, *Duke* 6566 (MO), 19 iv 1980, *Gentry et al.* 28665 (MO).

*Renalmia pirrensis* is distinguished from both *R. puberula* and *R. pluripllicata* by its distinct ligule (2–6 mm long). From *R. pluripllicata* it clearly differs by its indumentum of compass-needle hairs on the lower leafside and by its striate sheaths. *R. puberula* is also different from *R. pirrensis* by mostly green bracts and always sessile leaves.

*Croat* 37938 (MO, U) is anomalous by its indumentum: simple to furcate hairs on the upper leafside, and stellate-plurifurcate hairs on the lower leafside.

[56.] *Renalmia foliifera* Standley in Field Mus. Nat. Hist., Bot. Ser. 22:328 (1940). Fig. 2.

Type: Panama, Darién, Chepigana District, crest of Cana-Cuasi Trail, rain forest, c.1800 m, 15 iii 1940, c.fl., *M. E. & R. A. Terry* 1591 (holo. F).

Plants 0.5–1.5 m tall. Rhizomes to 12 mm thick. Sheaths striate, to 12(–22) mm wide, densely covered with hairs of the compass-needle type (to 0.3 mm wide). Ligule 3–10 mm long, hairy like the sheaths. Leaves sessile. Lamina (narrowly elliptic to) obovate, abruptly acuminate at the apex (acumen 10–15 mm long), cuneate at the base, 20–64 cm long, 9–17 cm wide, weakly to deeply 30–60-plicate, upper side glabrous to scarcely hairy, lower side densely to very densely covered with hairs of the compass-needle type and basally stellate hairs (to 0.5 mm wide). Inflorescence a terminal thyrs 5–19 cm long and 3–7 cm wide, or sometimes a basal one (3–)12–14 cm long with a scape 16–26 cm tall, beset with sheaths 2.5–6 cm long and 0.5–1 cm wide, rhachis 1–3 mm thick, cincinni 3–10-flowered. Indumentum of inflorescence: sheaths, rhachis, bracts, peduncles, bracteoles, pedicels, calyx, ovary, and capsule densely covered with basally stellate hairs and hairs of the compass-needle type (to 0.2 mm wide) to subglabrous; corolla densely hairy, hairs to 0.06 mm wide. Bracts green, persistent, narrowly to broadly elliptic, 15–36 mm long, 8–11 mm wide, obtuse to acute. Peduncles 2–5 mm long, the lower ones concaulescent, the adnate part to 4 mm long. Bracteole 7–10 mm long. Pedicels 3–10 mm long. Calyx cream coloured to bright orange, turbinate to urceolate, 4.5–6 mm long, 3–4 mm wide, lobes broadly triangular

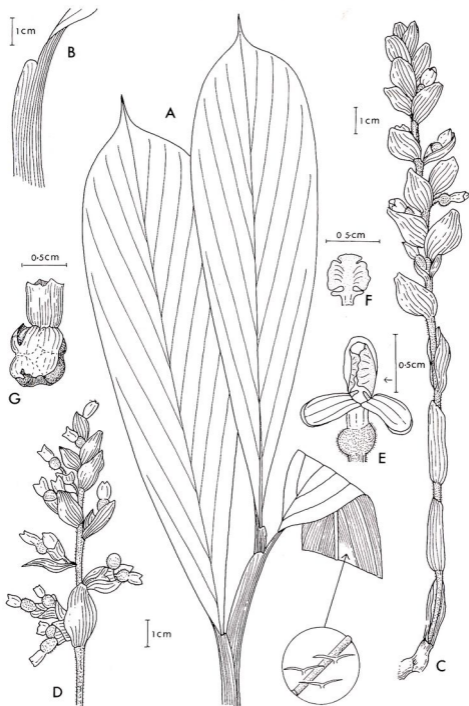


FIG. 1. *R. pirrensis*: A, Leaf-shoot (inset showing indumentum of lower leaf surface, much enlarged); B, ligule; C, inflorescence; D, infructescence; E, flower; F, labellum; G, fruit and calyx. A, B from *Folsom* 4277; C, D from *Croat* 37864; E, F from *Croat* 37938, G from *Duke* 6109.



FIG. 2. *R. foliifera*: A, leaf (inset showing indumentum of lower surface, much enlarged); B, basal inflorescence; C, terminal infructescence; D, bud. A from Croat 48646; B from Folsom 4523; C from Duke & Elias 13680; D from Folsom 4269.

to deltate, 2-2.5 mm long, 2 mm wide. Corolla creamy white, inside with red flecks, to 9 mm long, tube c.7 mm long, c.1.5 mm diam., lobes 2-2.5 mm long. Labellum c.9 mm long, c.4 mm wide when spread out, the limb 3-lobed, lateral staminodes c. 0.5 mm long. Anther c.2 mm long, c.0.7 mm wide. Style 8 mm long. Nectarial glands partly surrounding the style base, 1 mm long. Ovary ellipsoid. Capsule green to orange, ellipsoid to globose, 5-6 mm diam., its wall 0.1 mm thick when dry, 2-8-seeded, seeds 3 × 3.5 mm, aril present.

Distribution: Panama and Colombia; in cloud forest, 800-1800 m alt.

PANAMA. Darién: *Duke & Elias* 13680 (MO, U); Cerro Pirre, 1200 m, 10-20 vi 1977, *Folsom* 4269, 4433 (MO), 4523 (MO, U), 6284 (MO); *ibid.*, 1000 m, 8-10 iii 1972, *Gentry* 4601 (MO, U); Cerro Mali, 1300 m, 20 i 1975, *Gentry & Mori* 13727 (MO); *ibid.*, 1400 m, 23 i 1975, *Mori & Gentry* 4398 (MO, U); Cerro Sapo, 800 m, 1 ii 1978, *Hammel* 1161, 1193 (MO).

COLOMBIA. Chocó: Alturas de Nique, 30 xii 1980, *Hartman* 12443 (MO).

*Renealmia foliifera* differs from *R. concinna* in having 30-60-plicate leaves, and an often terminal inflorescence.

Three additional collections may be referable to *R. foliifera*: *Mori et al.* 7564 (MO) from Panama (Veraguas) differs in having a petiole up to 4 cm long, and rather small leaves; *Croat* 48646 and 50034 (MO), both from Panama (Chiriqui), have the same dense indumentum, but on both sides of the leaves.

[57.] *Renealmia variegata* Maas & Maas, *sp. nov.* Fig. 3.

Ab omnibus speciebus differt inflorescentia racemosa, bracteis persistentibus laminisque facie superiora albostriata, facie inferiora pilis malpighiaceis vestita.

Plants to 1.5 m tall. Rhizomes 5-10 mm thick. Sheaths striate, to 16 mm wide, glabrous to densely covered with simple, appressed hairs (to 0.4 mm long). Ligule 1-2 mm long, glabrous to hairy. Petiole 0-2.5 cm long. Lamina narrowly elliptic to obovate, acuminate at the apex (acumen 10-13 mm long), cuneate to gradually decurrent into the petiole, 15-50 cm long, 7-13 cm wide, upper side glabrous, dark green, 6-12 white veins on each side of the midrib prominent, lower side paler green, densely to very densely covered with hairs of the compass-needle type (to 0.6 mm wide). Scape erect, 11-23 cm tall, 2-3 mm diam., beset with sheaths 0.5-2.5 cm long and 0.3-0.5 cm wide. Inflorescence a congested, basal raceme, 2.5-8.2 cm long, 1.4-3 cm diam. Indumentum of inflorescence: sheaths, rhachis, bracts, peduncles, bracteoles, pedicels, calyx, ovary, and capsule very densely covered with simple, basally (pluri)furcate, and compass-needle hairs (to 0.4 mm long); corolla beset with only simple hairs. Bracts green, persistent, (narrowly) ovate-obovate, 10-25 mm long, 4-10 mm wide, top acuminate to acute (to obtuse). Peduncles 1-2 mm long, the lower ones concaulescent, the adnate part to 6 mm long. Bracteole tubular, 5-8 mm long. Pedicels 1-9 mm long. Calyx white to yellow to orange, tubular to urceolate, fleshy, 7-9 mm long, 3-5.5 mm wide, lobes (shallowly) triangular, 1-3.5 mm long, 1.5-3.5 mm wide. Corolla white, 12-12.5 mm long (5-6 mm in herbarium material), tube to 8.5 mm long, lobes 3.5-4 mm long, 2-3 mm wide. Labellum to 7 mm long and to 8.5 mm wide when spread out, middle lobe bilobulate, basal claw

c. 2.5 mm long and c. 1 mm wide, lateral staminodes 0.4–2 mm long. Anther 2.5–3 mm long, 0.8 mm wide, glabrous. Style 3–4 mm long. Nectarial glands partly surrounding the style base, 1–1.5 mm long. Ovary ellipsoid. Capsule orange, maturing black, ellipsoid to globose, 5.5–8.5 mm diam., its wall c. 0.1 mm thick when dry (0.5 mm thick in spirit), 11–13-seeded, seeds 2–3 mm diam., aril present.

Type: Ecuador, Pichincha, Carretera Quito–Puerto Quito, km 113, virgin forest, 800 m, 26 ii 1984, c.fl. et fr., *Ulloa* 87 (holo. QCA, iso. U).

Distribution: Panama, Colombia and Ecuador; in forests, near rivers, along roads, 200–800 m alt.

PANAMA. Darién: Cerro Pirre, 11 iv 1967, *Bristan* 498 (NY).

COLOMBIA. Chocó: Al Este del Río Surama, 200–400 m, 24 ii 1977, *Forero et al.* 3331 (COL, MO); San José del Palmar, hoya del Río Torito, 630–730 m, 5 iii 1980, *Forero et al.* 6741 (COL, MO), 8 iii 1980, 6876 (COL, MO), 14 iii 1980, 7303 (COL, MO, U), 21 iii 1980, 7564 (COL, MO). El Valle: Anchicayá, Cali–Buenaventura Rd, 11 viii 1952, *Køie* 4827 (C).

This species is characterized by a raceme with green persistent bracts, white-striped leaves, and an indumentum of hairs of the compass-needle type on the lower side of the leaves.

[58.] *Renealmia cylindrica* Maas & Maas, sp. nov. Figs 4 & 5.

Ab omnibus speciebus differt vagina manifeste reticulata, capsula 5–6-seminali inflorescentiaque cylindrica gelatinosa bracteis latis rubris ornata.

Plants to 3 m tall. Rhizomes unknown. Sheaths distinctly reticulate, to 20 mm wide and 27 cm long, very densely covered with simple hairs (to 0.4 mm long) especially on the transverse veins, and stellate prickles (to 0.1 mm long). Ligule 1–3 mm long. Petiole 0–40 mm long, hairy like the sheaths. Lamina (narrowly) elliptic-obovate, plicate, abruptly acuminate at the top (acumen to 20 mm long), cuneate at the base, 23–62 cm long, 11–18 cm wide, upper side glabrous except for simple hairs along the midrib, lower side densely to very densely covered with simple hairs (to 0.3 mm long) especially on the veins; margin and midrib of leaves, sheaths and pedicels tinged with purple. Scape erect, 11–22 cm tall, to 7 mm thick, beset with sheaths up to 6 cm long and 3 cm wide, to very densely covered with stellate prickles (to 0.04 mm diam.) and simple hairs (0.2 mm long). Inflorescence a spiciform, ovoid to cylindrical, basal thyse 4–16 cm long and 3–4.5 cm wide, with 1–3-flowered cincinni, completely covered with a thick gelatinous substance. Indumentum of inflorescence: rhachis, bracts, peduncles, pedicels, ovary and capsule to very densely covered with simple and basally (pluri)furcate hairs (to 0.3 mm long); bracteole and calyx subglabrous. Bracts basally white to red (or bright pink) at the top, imbricate, persistent, depressed ovate to circular, obtuse, apiculate just below the apex, 20–25 mm long, 25–30 mm wide. Peduncles 1–3 mm long. Bracteole pink, 12–16 mm long. Pedicels to 1 mm long. Calyx basally white to red at the top, tubular to turbinate, becoming fleshy with age, 7–10 mm long, 3–5.5 mm wide, the lobes triangular, 1.5–4 mm long, 3–4 mm wide. Corolla yellow to white, 15 mm long, glabrous, tube 8 mm long, lobes 7 mm long, 4–9 mm wide, obtuse. Labellum whitish yellow, 9 mm long, 12 mm wide when spread out, glabrous, limb horizontally spreading, 6 mm long, 12 mm wide, lateral lobes

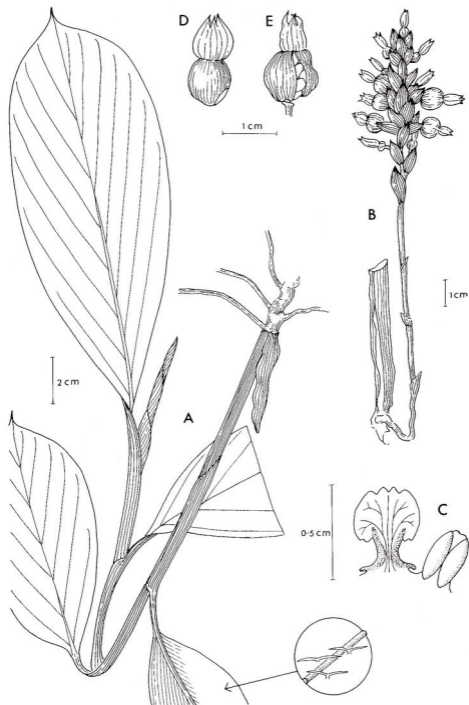


FIG. 3. *R. variegata*: A, Leaf-shoot (inset showing indumentum of lower leaf surface, much enlarged); B, inflorescence; C, labellum and stamen; D, capsule and calyx from spirit material; E, ibidem from dried material. From Forero *et al.* 7564.

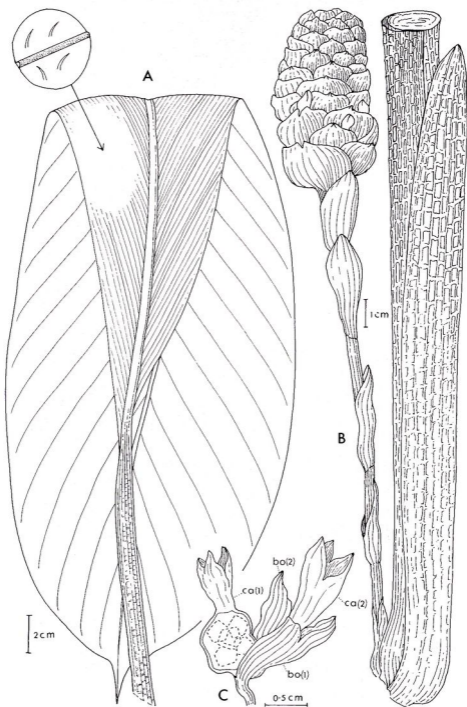


FIG. 4. *R. cylindrica*: A, leaf (inset showing indumentum of lower surface, much enlarged); B, inflorescence and sheaths; C, detail of fruiting cincinnus showing bracteoles (bo), calyces (ca) and 5-seeded capsule. A, B from *Forero* 7365; C from *Madison et al.* 5115.





FIG. 5. *R. cylindrica*. Inflorescence from *Maas et al.* 6512.

rounded, middle lobe fleshy, covered with little warts, bilobulate, lobules rounded, 1 mm long, basal claw 3 mm long, 2 mm wide. Anther pink to red, 4 mm long, 2 mm wide. Style 9.5 mm long. Nectarial glands partly surrounding the style base, 2 mm long. Ovary white, obovoid. Capsule red maturing black, obovoid, 7 × 8 mm, its wall c.0.1 mm thick when dry, 5-6-seeded, seed tan with orange aril, 2.5-3 × 2.5 mm.

Type: Colombia, Nariño, 5 km W of CONIF Fieldstation 'La Espriella', 45 km E of Tumaco, high forest, 5 vi 1986, c.fl., *Maas et al.* 6512 (holo. POPAYAN, iso. U).

Distribution: Panama, Colombia and Ecuador; in forests, to 1100 m alt.



FIG. 6. *R. purpurea*: A, leaf (inset showing details of sheath reticulations, much enlarged); B, inflorescences and rhizome; C, cincinnus showing first two flowers and bracteoles (bo); D, labellum and stamen; E, young capsule showing old, shrunken calyx; F, old, empty capsule; G, seed cluster. From Maas *et al.* 6131.

PANAMA. Darién: Ridge S of Río Setigandi, 800–1000 m, iv 1980, *Gentry et al.* 28604 (MO).

COLOMBIA. Chocó: Municipio de Novitá, 600–900 m, 22 ii 1977, *Forero et al.* 3116 (COL), 3149 (U); Municipio de San José del Palmar, 730–950 m, 3–15 iii 1980, *Forero et al.* 6574 (COL, MO, U), 7365 (COL, MO).

ECUADOR. Esmeraldas: Río San Miguel, 220 m, 1 ix 1980, *Holm-Nielsen et al.* 25469 (AAU); Ibarra-San Lorenzo Railroad, near Lita, 550–650 m, 9 vi 1978, *Madison et al.* 5115 (F, U).

This new species is characterized by reticulate sheaths (as in *R. vallensis*), more-seeded capsules (as in *R. costaricensis*), long bracteoles (12–16 mm), and large red bracts (20–25 × 25–30 mm), together creating a cylindrical inflorescence.

[59.] ***Renecalmia purpurea*** Maas & Maas, **sp. nov.** Fig. 6.

Ab omnibus speciebus differt vagina reticulata, lamina margina pilis simplicibus dense vestita labelloque purpureo.

Plants to 3 m tall. Rhizome to 15 mm thick. Sheaths reticulate to 15 mm wide, densely covered with needle-like hairs (to 0.4 mm long) especially on the transverse veins. Ligule 4–6 mm long, very densely covered with needle-like hairs (to 0.4 mm long). Petiole 110–140 mm long, covered with needle-like hairs (to 0.1 mm long). Lamina (narrowly) elliptic, acuminate at the apex (acumen 15–20 mm long), cuneate at the base, 33–46 cm long, 13–15 cm wide, c.15-plicate, glabrous, margins very densely covered with brown, simple hairs (to 0.4 mm long). Scape 9–20 cm tall, up to 4 mm thick, beset with sheaths up to 3.5 cm long and 1.5 cm wide. Inflorescence a basal thyrse 5–13 cm long and 4–8 cm wide, with 3–4-flowered cincinni, rhachis green. Indumentum of inflorescence: sheaths, rhachis, bracts, peduncles, bracteoles, pedicels, calyx, ovary, and capsule to very densely covered with furcate to plurifurcate hairs (to 0.1 mm long); corolla glabrous. Bracts green maturing brown, persistent, narrowly triangular-ovate, acute, to 20 mm long and 5 mm wide. Peduncles 5–7 mm long. Bracteole to 13 mm long. Pedicels 2–3 mm long. Calyx red maturing brown, urceolate and fleshy (in alcohol material), 4–7 mm long, 4–6 mm wide, the lobes triangular, 2.5–3 mm long. Corolla white, 8–9 mm long, the tube 4 mm long, the lobes 4–5 mm long, 2–3 mm wide. Labellum purple, central part yellow, 8 mm long and 8 mm wide when spread out, the limb horizontally spreading, 5 mm long, 8 mm wide, lateral lobes rounded, 4 mm long and 3 mm wide, middle lobe reflexed, with two triangular lobes c. 1 mm long, basal claw 2 mm long and 2 mm wide, lateral staminodes pinkish, 0.5 mm long. Anther pink, 3 mm long and 2 mm wide, glabrous. Style 6 mm long. Nectarial glands 1 mm long, forming a one-sided cylinder, only partly surrounding the style base. Ovary red, ellipsoid. Capsule maturing black, ellipsoid to globose, 10–12 mm long and wide, its wall 1 mm thick (in alcohol material), 15–20-seeded, seeds 3 × 3 mm, aril orange.

Type: Peru, Paucartambo, near Pillcopata, 700–800 m, 23 x 1984, c.fl. et fr., *Maas et al.* 6131 (holo. U, iso. USM).

Distribution: Peru, known only from the type locality; in forest, 700–800 m alt.

*Renealmia purpurea* can be recognized by its reticulate sheaths (covered by simple hairs), 15-20-seeded capsule, purple and yellow labellum, and by its leaf margins very densely covered with simple brown hairs. *R. asplundii* shares the character of leaf margin indumentum, but differs by having striate sheaths (covered with stellate prickles) and 2-6-seeded capsules.