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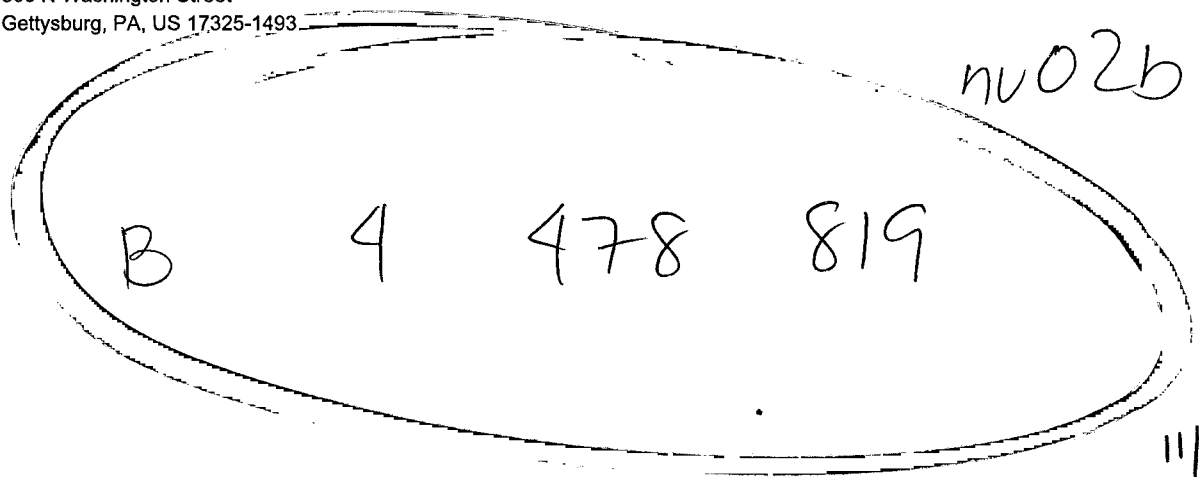
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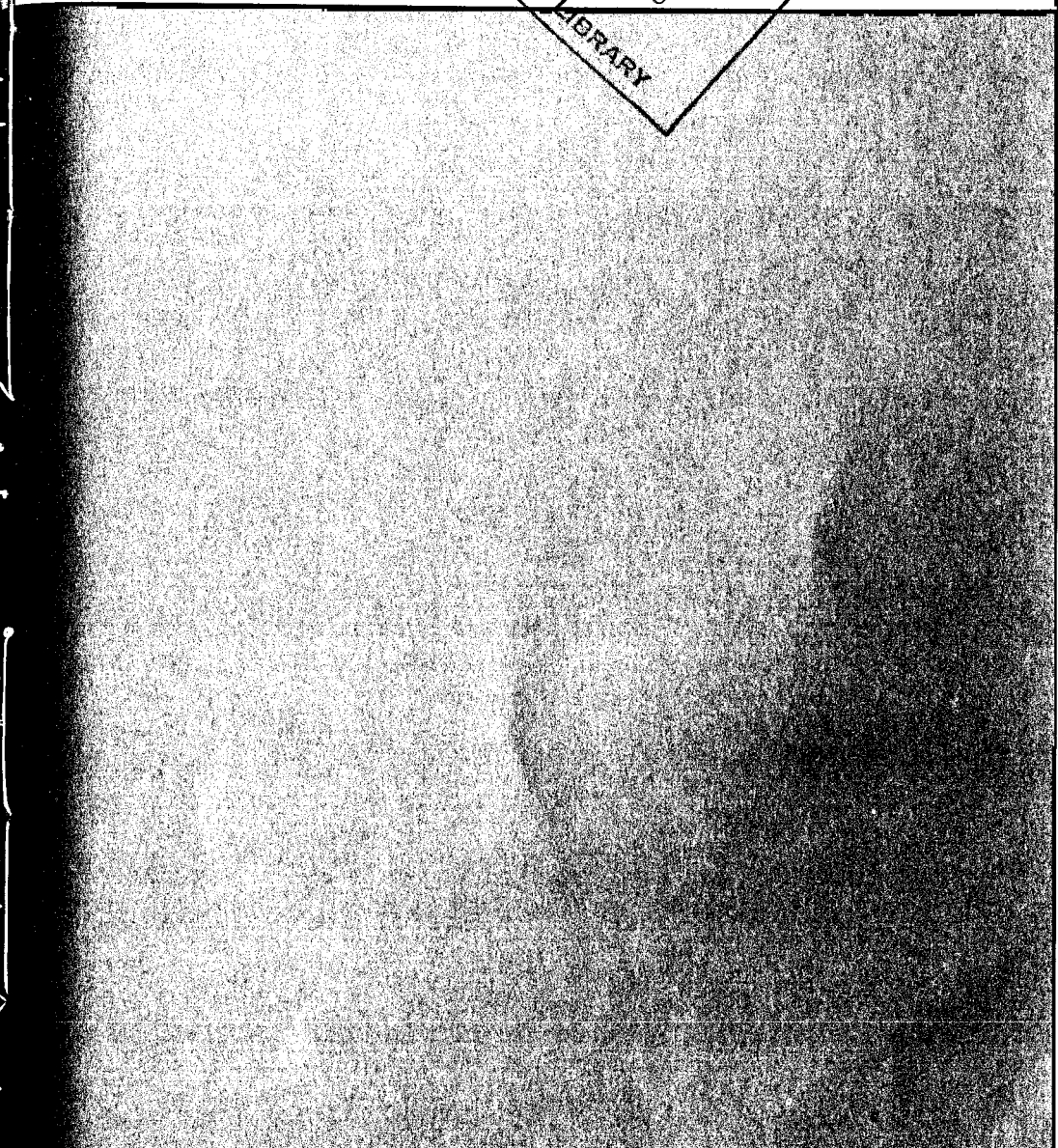
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Notes from the Royal Botanic Garden Edinburgh

Volume 46 No. 3

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Mrs N. M. Gregory

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NOTES ON NEW WORLD ZINGIBERACEAE: IV*
Some new species of *Costus* and *Renealmia*

P. J. M. MAAS & H. MAAS**

ABSTRACT. Three new species of *Costus* (sect. *Ornithophilus*) and two new species of *Renealmia* are described, and a revised key to the species of *Costus* with separate flowering shoots and unappendaged bracts is given.

Recent collections of Zingiberaceae sent to Utrecht for identification from tropical America contained five new species which are described in this paper. The numerical sequence used here follows that used in the *Flora Neotropica* accounts. The revised key on page 314 replaces part of the key in *Flora Neotropica* 18: 172 (1977).

[40] *Costus asteranthus* Maas & Maas, sp. nov. Figs 1 & 2.
Differt aliis speciebus generi *Costus* sectio *Ornithophilus* ligula brevi (1-2mm longa), calyce longa (17-22mm) corollaque lobis patentibus asteriformibus.

Plants to 2m tall. *Sheaths* to 18mm diam. at base of plant, glabrous. *Ligule* truncate, 1-2mm long, glabrous. *Petiole* 10-15mm long, glabrous. *Lamina* dark green above, shiny pale green below, (narrowly) elliptic to (narrowly) obovate, cuneate at base, acuminate and mucronate at apex (acumen to 20mm long), 18-28 × 6.5-10cm, upper side glabrous, lower side glabrous to covered with scattered appressed hairs. *Flowering shoots* to 85cm tall, sheaths green with reddish base and upper margin, obliquely truncate, to 6 × 2.2cm. *Inflorescence* narrowly ellipsoid to narrowly ovoid, obtuse to acute at apex, 6-10 × 3-4cm. *Indument of inflorescence*: sheaths, rhachis, bracts, bracteoles, calyx, corolla, ovary, and capsule glabrous. *Bracts* red, coriaceous, obovate-triangular, obtuse, 3.5-4.5 × 2-2.5cm, callus white, to 10mm long. *Bracteoles* pink, 22-35mm long. *Calyx* pink, tubular, 17-22 × 7-8mm, lobes shallowly triangular, 2 × 3-4mm. *Corolla* yellow, 73-80mm long, tube 8-10mm long, lobes patent, narrowly elliptic, 65-70mm long, dorsal one 12mm wide, lateral ones 10mm wide. *Labellum* yellow, obtriangular when spread out, 40-45 × 20-28mm, middle lobe reflexed, irregularly dentate (teeth to 3mm long), the middle tooth narrowly obovate, 10 × 3-5mm, acute, lateral lobes involute and forming a tube 10-15mm diam., inner side with two lengthwise rows of simple hairs. *Stamen* yellow, 50-55 × 10mm, apex obtuse, minutely lacerate. *Style* 55-65mm long. *Ovary* oblong to narrowly obovoid. *Capsule* ellipsoid, 12 × 10mm.

Type: Peru, Dept. Puno, Prov. Carabaya, vicinity of San Gabán (= Lanlacuni Bajo), steep forested hills, 600-800m, 18 × 1984, fl & fr, P. J. M. & H. Maas, L. Y. Th. Westra & C. Roersch 6086 (holo. U, accompanied by spirit material; iso. F, K, MO, NY, USM).

Distribution: Known only from the type locality.

*I in *Acta Bot. Neerl.* 24: 469-480 (1975); II *ibid.* 28: 90 (1978); III in *Notes RBG Edinb.* 44: 237-248 (1987).

**Institute of Systematic Botany, State University of Utrecht, Heidelberglaan 2, PO Box 80.102, 3508 TC Utrecht, The Netherlands.

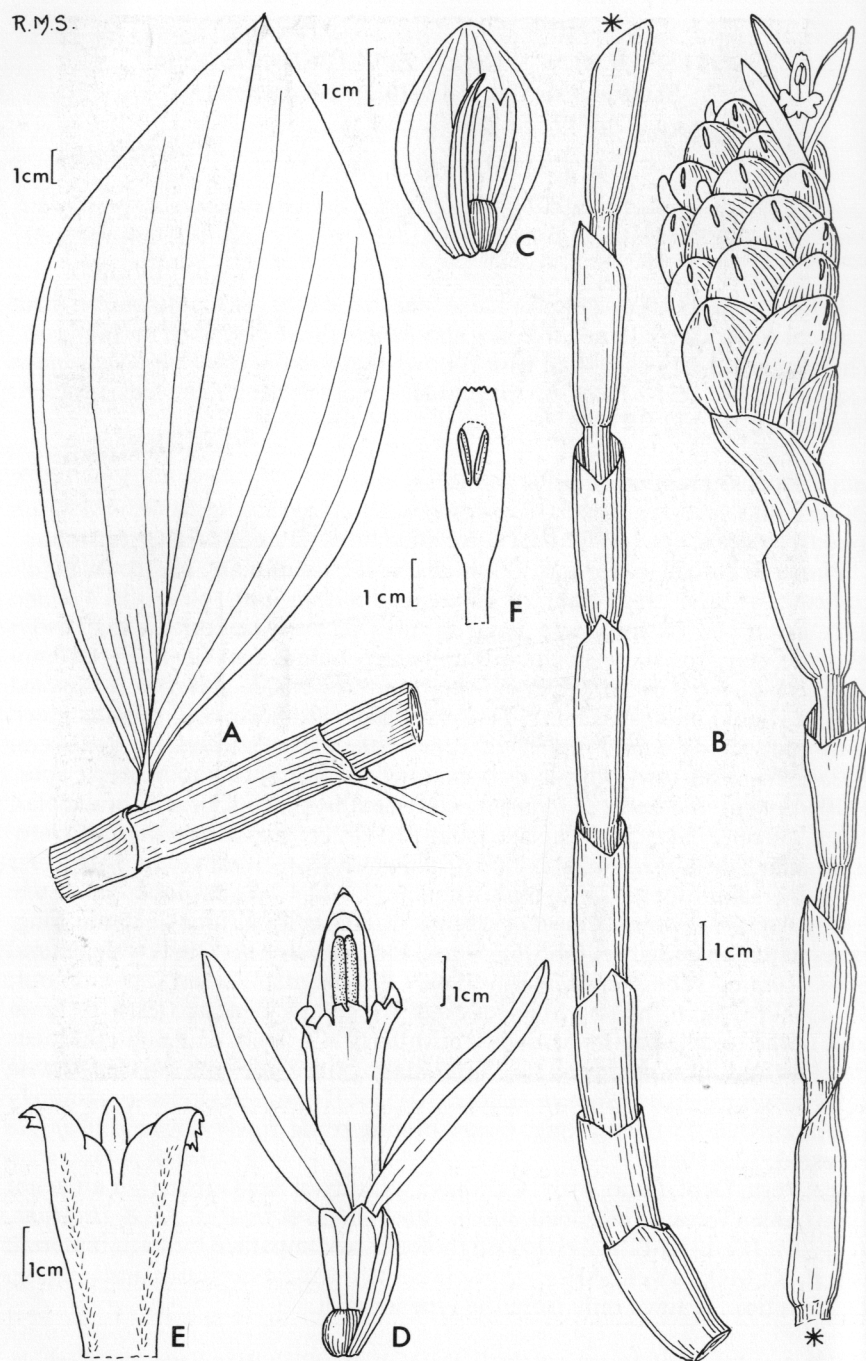


FIG. 1. *Costus asteranthus*: A, part of stem showing leaf and ligule; B, habit showing inflorescence; C, bract, bracteole, calyx and ovary; D, flower; E, labellum; F, stamen. All from *Maas et al.* 6086.

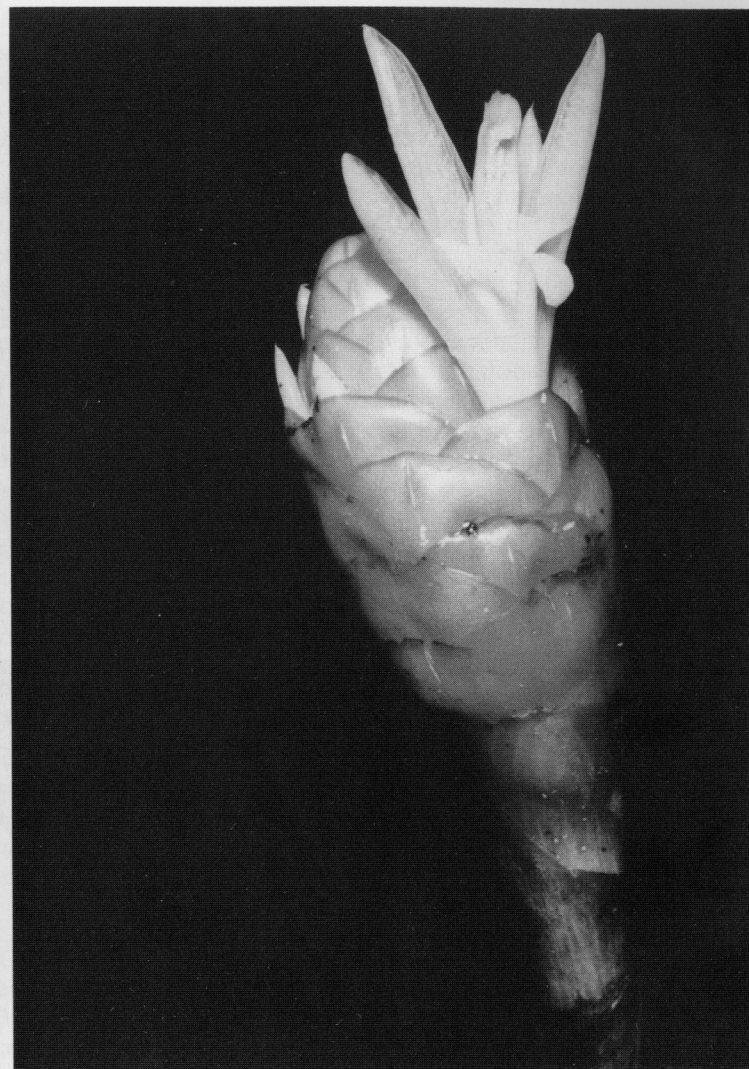


FIG. 2. Inflorescence of *C. asteranthus*, *Maas et al.* 6086. From a colour slide by L. Y. Th. Westra.

This species is characterized by a basal red-bracteate inflorescence and yellow flowers. The labellum of the flower is tubular, and the corolla lobes are definitely patent creating a star-like appearance: the new species is named after this feature which is unique in *Costus*.

In the event of there being no flowers, the almost glabrous plant can be recognized by its extremely short ligule (1–2mm) and its long calyx (17–22mm).

[41] *Costus beckii* Maas & Maas, *sp. nov.*

Differt aliis speciebus generi *Costus* sectio *Ornithophilus* ligula longa (55–60mm) indumentoque proprio.

Fig. 3.

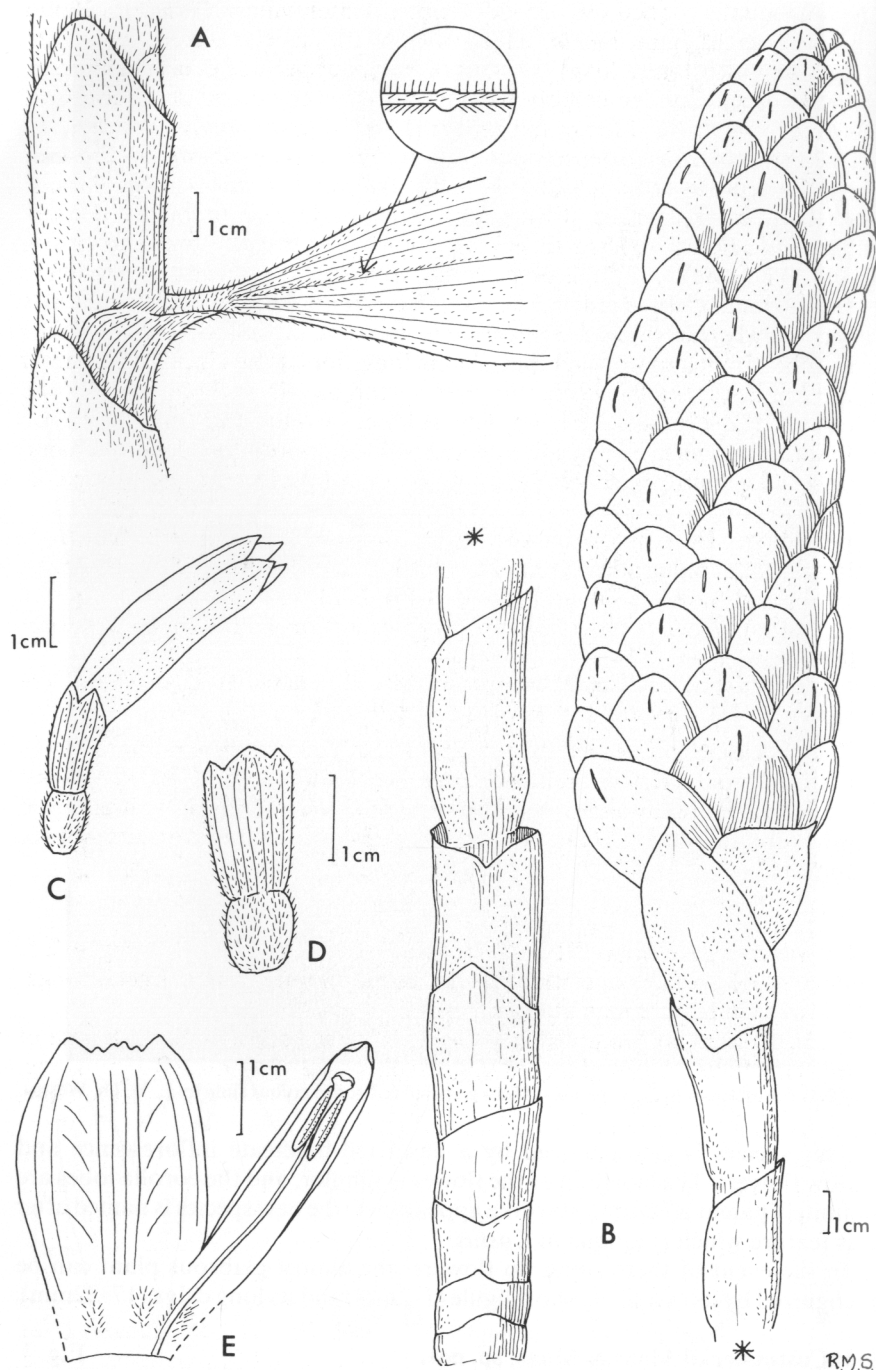


FIG. 3. *Costus beckii*: A, part of stem showing leaf base and ligule; B, habit showing separate flowering stem; C, flower; D, calyx and ovary; E, labellum and stamen. All from Beck 7324.

Plants to 3m tall. *Sheaths* over 25mm diam. at base of plant, densely strigose. *Ligule* unequally 2-lobed, (30-)55-60mm long, densely villose. *Petiole* 10-20mm long, hairy as the ligule. *Lamina* elliptic to obovate, cuneate at base, acuminate at apex (acumen 15mm long), 39-43 × 14-15cm, upper side densely villose or glabrous except for the densely hairy midrib, lower side densely sericeous. *Flowering shoots* to 110cm tall, sheaths reddish, obliquely truncate, to 6.5 × 2.5cm, glabrous to densely puberulous. *Inflorescence* oblong to ellipsoid, obtuse to acute at apex, 9.5-20 × 5-5.5cm. *Indument of inflorescence*: bracts, bracteoles, calyx, corolla, ovary, and capsule densely to rather densely puberulous. *Bracts* reddish to purple, coriaceous, broadly ovate to ovate, obtuse (to acute), 3-3.5 × 2-3cm, callus 6-9mm long. *Bracteoles* reddish, 23-30mm long. *Calyx* reddish, tubular (to turbinate), 12-15 × 5-10mm, lobes very shallowly triangular, 2-3 × 5mm. *Flowers* tubular, yellow. *Corolla* 50mm long, tube 15mm long, lobes elliptic, 35mm long, dorsal one 17mm wide, lateral ones 12mm wide. *Labellum* elliptic when spread out, 45 × 25mm, middle lobe 3-lobulate (?), lobules c.5 × 5mm, lateral lobes involute and forming a tube c.10mm diam., inner side basally covered with patches of dark coloured hairs. *Stamen* 45 × 9mm. *Style* 40mm long. *Ovary* ellipsoid. *Capsule* obovoid, 15-18 × 8-11mm.

Type: Bolivia, Dept. Cochabamba, Prov. Chapare, Villa Tunari, 14km from Palmar, foot of mountains, 550m, 24 xi 1981, fl & fr, S. G. Beck 7324 (holo. U, accompanied by spirit material; iso. K, LPB, NY).

Distribution: Known only from the type collection and a single Peruvian collection.

PERU. Madre de Dios, Manú, km139 on road from Cabo de Hornos to Shintuya, forested ridge and roadside, 27 viii 1974, fl & fr, R. B. Foster et al. 4010 (F, U).

This species, characterized by a separate basal inflorescence with red bracts and yellow tubular flowers, is named after its collector, Stephan Beck, who has for many years greatly stimulated botanical research in Bolivia. It differs from *Costus vargasii* Maas & Maas by its very long ligule (55-60mm) and its distinct indument.

[42] *Costus vargasii* Maas & Maas, sp. nov.

Figs 4 & 5.

Differt aliis speciebus generi *Costus* sectio *Ornithophilus* ligula longa (25-35mm) indumentoque absenti.

Plants to 1.5m tall, completely glabrous. *Sheaths* to 17mm diam. at base of plant, sometimes slightly glaucous. *Ligule* (un)equally 2-lobed, 25-35mm long. *Petiole* 10-15mm long. *Lamina* very dark dull green above, purplish below, narrowly obovate, rounded to cuneate at base, acuminate and mucronate at apex (acumen to 12mm long), 32-37 × 7-10.5cm. *Flowering shoots* to 80cm tall, sheaths reddish at base, green towards apex, somewhat inflated in ripe stage, obliquely truncate, to 7 × 2.2cm. *Inflorescence* narrowly oblong, rounded at apex, 4-8 × 2.5-3.5cm. *Bracts* red, coriaceous, obovate, obtuse, 2.5-3.5 × 1.7-2.5cm, callus pale red, 6-8mm long. *Bracteoles* 19-22mm long. *Calyx* turbinate, 10 × 7-9mm, lobes very shallowly triangular, 1 × 4mm. *Flowers* yellow, tubular, upper part at an angle of 45° with the axis of the inflorescence. *Corolla* yellow, 53-55mm long, tube 5-7mm long, lobes narrowly elliptic, 48-50mm long, dorsal one 17mm wide, lateral ones 12mm wide. *Labellum* yellow, obovate when spread out, 35 × 18mm, middle lobe 5-lobulate, lobules

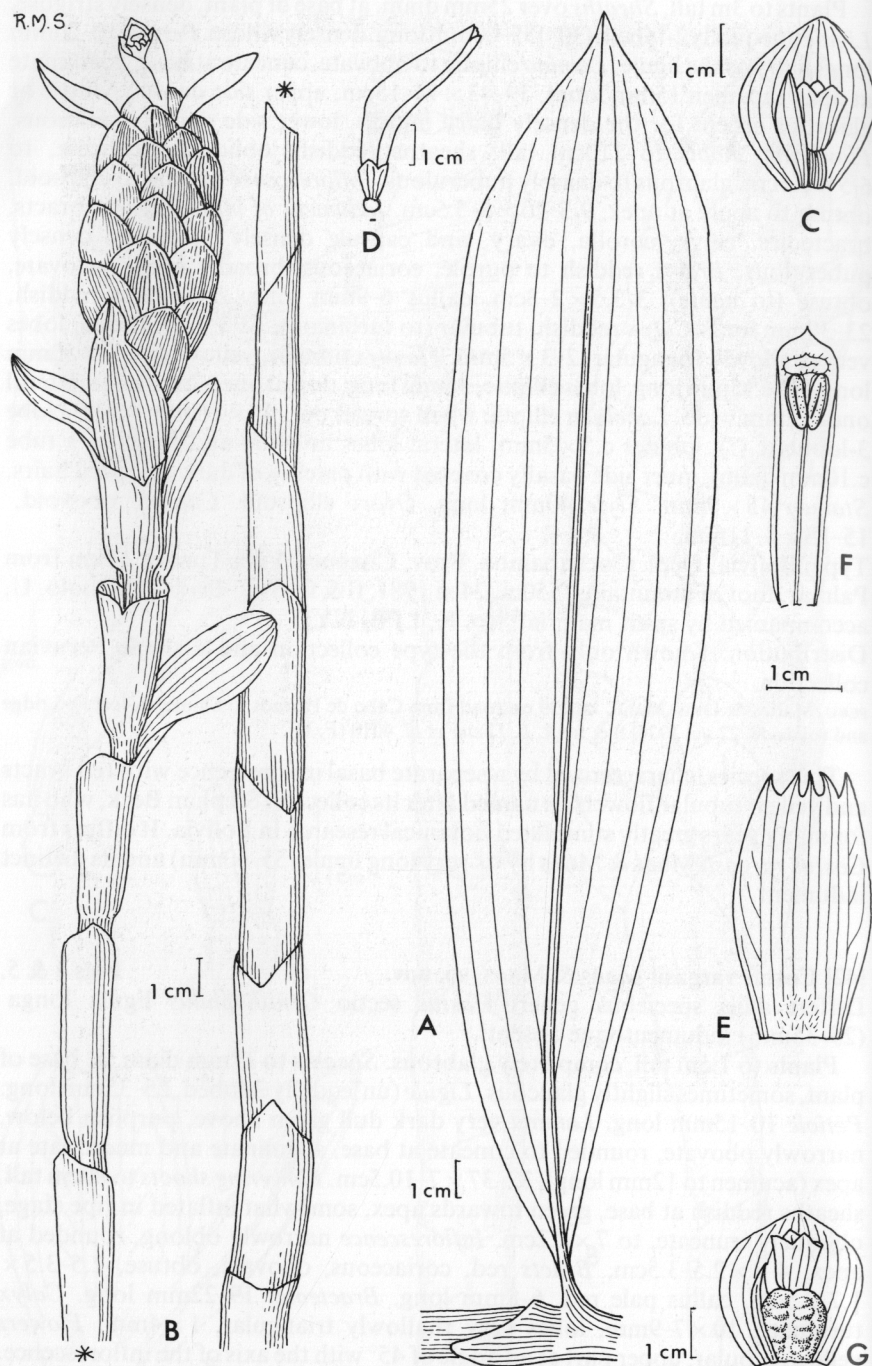


FIG. 4. *Costus vargasii*: A, habit showing leaf and ligule; B, habit showing inflorescence; C, young bract, bracteole, calyx and ovary; D, curved flower; E, labellum; F, stamen; G, older bract, bracteole, calyx and capsule. All from Maas *et al.* 6156.



FIG. 5. Inflorescence of *C. vargasii*, Maas *et al.* 6156. From a colour slide by L. Y. Th. Westra.

4 × 3mm, the middle one 4 × 1mm, lateral lobes involute forming a tube 10mm diam., inner side hairy at base. *Stamen* yellow, 37 × 9mm, apex obtuse, apiculate. *Style* 60mm long. *Ovary* oblong to obovoid. *Capsule* obovoid to ellipsoid, 10–12 × 5–12mm.

Type: Peru, Dept. Cuzco, Prov. Paucartambo, road from Pillcopata to Salvación, 2km before Atalaya, forest margin along road, 700–800m, 24 x 1984, fl & fr, P. J. M. & H. Maas, L. Y. Th. Westra & C. Roersch 6156 (holo. U, accompanied by spirit material; iso. F, K, MO, NY, USM).

Distribution: Known from two collections from Peru, 400–800m. PERU. Madre de Dios: Manú, Shintuya, 400m, 6 x 1966, fl, Vargas C. 17846 (US).

This species, characterized by a separate basal inflorescence with red bracts and yellow tubular flowers, has a long ligule as in *C. beckii*, but the whole plant is completely glabrous. It is named after Dr Cesar Vargas C., Nestor of Peruvian botany.

KEY TO SECTIONS OF *COSTUS* SUBGENUS *COSTUS*

1. Labellum large, composed of a short, rather broad tube and a distinct, exposed limb, white to yellow, lateral lobes often striped with red to purple; bracts mostly green **Section *Costus***
- × Labellum small, tubular, yellow, orange, or reddish; bracts concolorous, or rarely green **Section *Ornithophilus***

KEY TO SPECIES OF *COSTUS* SUBGENUS *COSTUS*

1. All bracts provided with foliaceous, green or reddish appendages, or apices of all bracts reflexed..... **Group 1**
(For a key to species in Group 1 see *Flora Neotropica* 18: 171, 1977)
- × Bracts not appendaged, or only the lowest provided with appendages
Group 2

KEY TO SPECIES OF *COSTUS* GROUP 2

1. Inflorescence basal, terminating a separate leafless shoot 2
- × Inflorescence terminal on a leafy stem
(For continuation of this part of key see *Flora Neotropica* 18: 172, 1977)
2. Leaves linear, 0.8–2cm wide; bracts red; calyx 15–16mm long; flowers yellowish, c.80mm long (Costa Rica)..... **32. *C. stenophyllus***
(sect. *Ornithophilus*)
- × Leaves greater than 2cm wide 3
3. Leaves cordate (to rounded) at base; bracts green; flowers snow-white, (labellum slightly tinged with yellow or purple) (Tropical South America)
10. *C. arabicus*
(sect. *Costus*)
- × Leaves rarely cordate; flowers never snow-white (except for *C. acreanus*)
4
4. Bracts densely velutinous, green; calyx 16–22mm long; labellum white, slightly tinged with yellow and red (Amazonian parts of Colombia, Brazil, Peru and Bolivia) **13. *C. acreanus***
(sect. *Costus*)
- × Bracts never velutinous, but glabrous, puberulous, strigulose or strigose
5
5. Sheaths rather densely or densely hirsute to strigose 6
- × Sheaths glabrous, sparsely strigulose, or sparsely villose-hirsute 8
6. Bracts acute, apex slightly curved outwards; ligule 10–15mm long; calyx 18–22mm long (Amazonian parts of Colombia, Ecuador and Peru)
15. *C. longebracteolatus*
(sect. *Costus*)
- × Bracts obtuse; calyx 10–15mm long 7

7. Ligule 55–60mm long; calyx 12–15mm long (Amazonian parts of Peru and Bolivia) **41. *C. beckii***
(sect. *Ornithophilus*)
- × Ligule 1–10mm long; calyx 10–14mm long (Colombia [El Valle, 1300–1500m]) **31. *C. plowmanii***
(sect. *Ornithophilus*)
8. Calyx 6–8mm long; labellum yellow, striped with dark purple (Central America and western South America) **21. *C. laevis***
(sect. *Costus*)
- × Calyx 10–22mm long 9
9. Bracts green; labellum with large spreading limb, yellow with red venation (Amazonian parts of Colombia, Brazil, Ecuador and Peru)
14. *C. amazonicus*
(sect. *Costus*)
- × Bracts red; labellum small and tubular (except for *C. zamoranus*) 10
10. Leaves 36–57 × 13–20cm; calyx 15–19mm long; corolla and labellum reddish, c.100mm long (Ecuador) **33. *C. geothyrsus***
(sect. *Ornithophilus*)
- × Leaves rarely up to 47 × 18cm 11
11. Ligule 25–35mm long; plant completely glabrous (Amazonian parts of Peru) **42. *C. vargasii***
(sect. *Ornithophilus*)
- × Ligule 1–10mm long 12
12. Calyx 17–22mm long; flowers 73–80mm long, yellow, corolla lobes patent (Peru [Prov. Carabaya]) **40. *C. asteranthus***
(sect. *Ornithophilus*)
- × Calyx 8–15mm long 13
13. Leaves (almost) glabrous on both sides 14
- × Lower side of leaf densely to sparsely puberulous to strigose; corolla 60–65mm long; calyx 14–15mm long, margins of lobes decaying into fibres (Amazonian parts of Colombia, Ecuador and Peru)
31. *C. erythrocoryne*
(sect. *Ornithophilus*)
14. Flowers yellow; labellum with large spreading limb, striped with reddish brown; ligule 1–5mm long, (Amazonian parts of Ecuador)
14bis. *C. zamoranus*
(sect. *Costus*)
- × Flowers pinkish red, labellum small and tubular, not striped; ligule 5–10mm long (French Guiana, Surinam and Amazonian parts of Peru)
30c. *C. erythrothyrsus*
(= *C. aff. spiralis*)
(sect. *Ornithophilus*)

[60] *Renealmia microcalyx* Maas & Maas, sp. nov.

Fig. 6.

Ab omnibus speciebus generi *Renealmia* differt vagina striata capsulaque nigra prominenter trivalvata calice parvo coronata.

Plants to 3m tall. *Rhizomes* to 20mm thick. *Sheaths* striate, rarely slightly reticulate, 10–15 diam., to 20mm at base of plant, densely covered with stellate prickles to 0.05mm long and some simple hairs to 0.1mm long. *Ligule* 1–2mm long, hairy like sheaths. *Petiole* 0–60mm long, hairy like sheaths. *Lamina*

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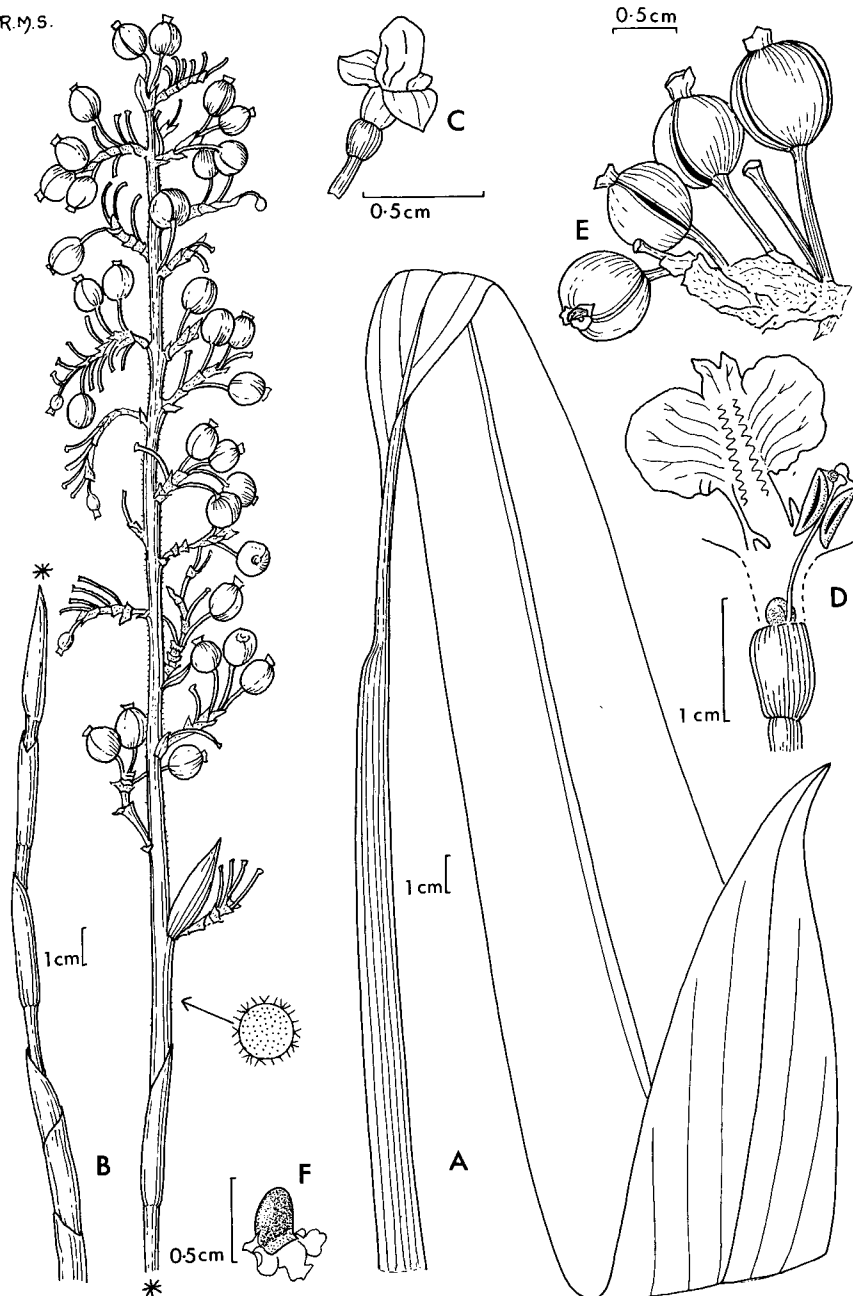


FIG. 6. *Renealmia microcalyx*: A, leaf; B, inflorescence; C, young flower showing ovary, calyx and corolla in bud; D, dissected flower showing ovary, nectarial glands, style, labellum, lateral staminodes and stamen; E, cincinnus of infructescence showing withering bracteoles, abscised calyx and prominent margins of valves of capsule; F, seed with aril. A, B from Liesner & Hall 3450; C from Liesner 6437; D from Maas et al. 6834; E from Plowman 13693; F from Nascimento et al. 224.

narrowly elliptic (to narrowly obovate), cuneate at base, acuminate at apex (acumen 10–15mm long), 32–67 × 4.5–10cm, slightly 10–11-plicate (Maas et al. 6834), upper side glabrous, lower side glabrous or covered with some furcate to plurifurcate hairs to 0.2mm long. *Flowering shoots* erect, 18–48cm tall, beset with sheaths 2–5.5(–7.5) × 0.5–1cm, very densely covered with stellate prickles to 0.05mm long. *Inflorescence* a lax thyrse, 13–28 × 4–8cm, with 4–11(–16)-flowered cincinni, rhachis pale green. *Indument of inflorescence*: rhachis, bracts, peduncles, bracteoles, pedicels and ovary very densely covered with simple, furcate or plurifurcate hairs to 0.3mm long; calyx sparsely to densely covered with the same indument and compass-needle hairs to 0.1mm long; capsule often sparsely covered with the same indument, or glabrous. *Bracts* green, herbaceous, mostly persistent, narrowly triangular-ovate, acute, 23–70 × 4–7mm. *Peduncles* (2–)5–20mm long. *Bracteoles* pale green, 6–10mm long, withering and turning brown with age. *Pedicels* pale green, 10–25mm long. *Calyx* yellow-green turning brown, turbinate to tubular, 4–5(–6)* × 1.5–2.5mm, lobes broadly to shallowly triangular, 1–2 × 1–2mm, circumscissile just above base: calyx on fruit 1–3 × 1–2mm. *Corolla* yellow to white or pale green, 5–5.5(–13)mm long, tube 3(–7)mm long, lobes 2.5(–6.5) × 1.5(–5)mm. *Labellum* white to yellow, 5–6(–11.5) × 3(–8)mm, limb 5.5 × 8mm when spread out, lateral lobes 4 × 3mm, spreading, middle lobe dark yellow, bilobulate, lobules 1.5 × 1mm, with 2 callose bands, basal claw with 2 purple lines, 6 × 2mm, lateral staminodes 1 × 0.2–0.3mm. *Stamen* pinkish, upper margin red, 2–2.5 × 2–3mm. *Style* white c. 1.2mm long. *Nectarial glands* multilobulate, only partly surrounding style base, 1mm long. *Ovary* reddish green, ellipsoid to ovoid, 2.5 × 2mm. *Capsule* dark green and shiny, maturing purple-black, ellipsoid to globose, ± trigonous by the prominent margins of the valves, 7–13 × 7–10mm, wall 0.2mm thick when dry (1mm in spirit material), glossy inside, 8–15-seeded, seeds 3–3.5 × 2–2.5mm, aril yellow-orange, lacerate.

Type: Venezuela, Amazonas, Huachica, 11km NE of San Carlos de Río Negro, primary forest, 13 xi 1977, fr. R. L. Liesner & J. Hall 3450 (holo. U, iso. MO).

Distribution: Endemic to the upper Río Negro basin of both Venezuela and Brazil, where it is found in primary forest, secondary forest along roadsides, high caatinga forest and in savannas, to 350m.

VENEZUELA. Amazonas: 11km NE of San Carlos de Río Negro, along road to Solano, 75m, 24 iv 1984, Davidse & Miller 26527 (MO, U); Cerro Neblina base camp on Río Mawarinuma, 150–350m, 3 v 1984, Gentry & Stein 47140 (MO, U); San Carlos de Río Negro, c.20km S of confluence of Río Negro and Brazo Casiquiare, 120m, 5 iv 1979, Liesner 6187 (MO, U); *ibid.*, 10 iv 1979, Liesner 6437 (MO, U); *ibid.*, 19 vi 1979, Liesner 7566 (MO, U); Dept. Río Negro, from Los Tambores of Comisión de Limite to Caño Erubichi on Río Baria, 130m, 2 iv 1984, Liesner 17096 (MO, U); Río Yatua, Piedra Araucaua, 100–140m, 27 ix 1957, Maguire et al. 41616 (NY); base of Piedra de Tubari (part of Piedra de Cucuy, 150–200m, 30 x 1987, Maas et al. 6882 (INPA, NY, U); 8–10km N of San Carlos de Río Negro on road to Solano, 21 iv 1984, Plowman 13963 (F, U); San Carlos, around airport, 125m, 17–18 iv 1970, Steyermark & Bunting 102689 (U, VEN); Maroa, Guainía, Alto Orinoco, 127m, Ll. Williams 14232 (F, US, VEN).

BRAZIL. Amazonas: Río Negro, near mouth of Río Xié, 21 x 1987, Maas et al. 6834 (INPA, NY, U); Río Negro, Porto Camanaus, 19 x 1978, Madison et al. 6454 (SEL, U); Cucuí, 26 iv 1975, Nascimento et al. 224 (IAN, U); Serra do Curicuriari, 25 x 1978, Nascimento 752 (U).

This species from the Río Negro basin is characterized by striate sheaths and black, prominently 3-valvate capsules crowned by a very small calyx remnant.

*Measurements taken from spirit material are given in italics.

These features also discern this new species from *R. floribunda*, presumably its closest relative as already suggested in the *Flora of Venezuela* 11(2): 225 (1982).

[61] *Renalmia pacifica* (Maas) Maas & Maas, **comb. nov.** Fig. 7.
 Syn: *Renalmia occidentalis* (Swartz) Sweet var. *pacifica* Maas in Acta Bot. Neerl. 24: 478 (1976) and in Flora Neotropica 18: 106 (1977).

Plants 1–3.5m tall. Sheaths, ligule and lamina glabrous. *Sheaths* striate, 6–12mm diam., to 20mm at base of plant. *Ligule* 1–2mm long. *Petiole* absent. *Lamina* narrowly elliptic to narrowly obovate, cuneate at base, acute to acuminate at apex (acumen 10–20mm long), 24–45 × 3–8cm. *Flowering shoots* erect, 35–115cm tall, beset with red sheaths up to 17 × 1.2cm. *Inflorescence* a lax thyrs, (10–)20–35 × 3–12cm, with 2–4(–5)-flowered cincinni, rachis red. *Indument of inflorescence*: all parts glabrous to sparsely, rarely densely, covered with simple, rarely also furcate, hairs 0.1–0.3mm long. *Bracts* red, herbaceous, deciduous, narrowly triangular-ovate to triangular-ovate, acute or obtuse, 15–70 × 5–10mm. *Peduncles* red, 5–50mm long. *Bracteoles* red, 10–17mm long. *Pedicels* red, 3–20mm long. *Calyx* red, turbinate, 4–10 × 4–7mm (2–4mm wide at base), lobes depressed ovate, obtuse, 1–4 × 3–6mm. *Corolla* yellow, 15–21mm long, tube (5–)8–11mm long, lobes 9–10 × 5–8mm. *Labellum* 9–12 × 5–7mm when spread out, limb 6 × 7mm, lateral lobes rounded, 4–6 × 1–2mm, middle lobe reflexed, entire to irregularly lobulate, basal claw 4–6 × 3–4mm, hairy at base, lateral staminodes 1–1.5mm long. *Style* 18–20mm long. *Nectarial glands* multilobulate, only partly surrounding style base, 1.5mm long. *Ovary* red. *Capsule* red, narrowly ellipsoid to ellipsoid, (9–)12–25 × 5–10mm, wall 0.1mm thick when dry, 10–22-seeded, seeds 2–4 × 2–3mm.

Type: Mexico, Prov. Oaxaca, Finca El Carmen, 3 ii 1945, fl, *E. J. Alexander* 498 (holo. NY).

Distribution. Pacific slopes of Mexico, Guatemala and El Salvador, on steep slopes from sea level to 1800m, in wet oak and montane forest.

MEXICO. Chiapas, E base of Cerro Tres Picos near Cerro Bola, Mun. of Villa Corzo, 1500–1800m, 4 v 1972, *Breedlove* 25059 (MO); *ibid.*, 27 v 1972, *Breedlove* 25480 (MO); Mt Ovando, 9–12 iv 1937, *Matuda* 1844 p.p. (MICH); Colonia Jalapa, 16km W of El Triunfo, Escuintla, 900m, 14 vii 1948, *Matuda* 18088 (F); Cerro Tres Picos, Villa Corzo, 1200m, 19 v 1972, *McDougall* 458 (NY). Guerrero: Montes de Oca, Vallecitos, 7 xi 1937, *Hinton* 10591 (B, F, IJ, K, MICH, NY, S, US). Nayarit: Cerro de la Gloria, 400m, 1923, *Ortega* 78 (US). Oaxaca: Poichutla, Cerro Espino, 700–950m, 16 iv 1917, *Conzatti et al.* 3094 (MO, US); km5 N of Matias Romero, 0–50m, 27 vii 1958, *King* 835 (MICH, US); Chiltepec, 200m, 22 viii 1941, *Martinez-Calderón* 603 (MICH); Rio Sal, Lachao, Juquila, 1200m, 29 v 1972, *McDougall* 472 (NY); Cafetal Concordia, 400–650m, 1–15 iv 1933, *Morton & Makrinus* 2400 (US); near Oaxaca, xii 1897, *Rösling* s.n. (K); Juquila, near Sta. Rosa, km195 on road from Oaxaca to Puerto Escondida, 1300m, 13 iv 1965, *Rzedowski* 19584 (MICH).

GUATEMALA. Sololá, Volcán Atitlán above Finca Mocá, 1000–1250m, 20 vi 1942, *Steyermark* 47894 (F).

EL SALVADOR. San Salvador, market, v 1922, *Caldéron* 691 (GH, MO, NY, US); top of Cerro de San Jacinto, 1924, *Caldéron* 2204 (US); La Libertad, Los Chorros, W of Sta. Tecla, 700m, 11 v 1951, *Rohweder* 1227 (MO); Sonsonate, Las Caleras, E of Yuayúa, 1000m, 30 vii 1951, *Rohweder* 1229 (MO); without locality, 1942, *Sola*, *Krukoff* 15545, 15925, 16032 (U).

Renalmia pacifica was previously judged (*Flora Neotropica* 18: 106, 1977) to be a variety of *R. occidentalis* (Swartz) Sweet. The availability of more herbarium material now makes it possible to establish it as a new species.

R. pacifica differs from *R. aromatica* (= *R. occidentalis*) by almost glabrous, fewer-flowered cincinni (2–4 v. 2–17), longer peduncles (5–50mm v. 4–12mm), longer and differently shaped capsules (12–25mm and narrowly ellipsoid to

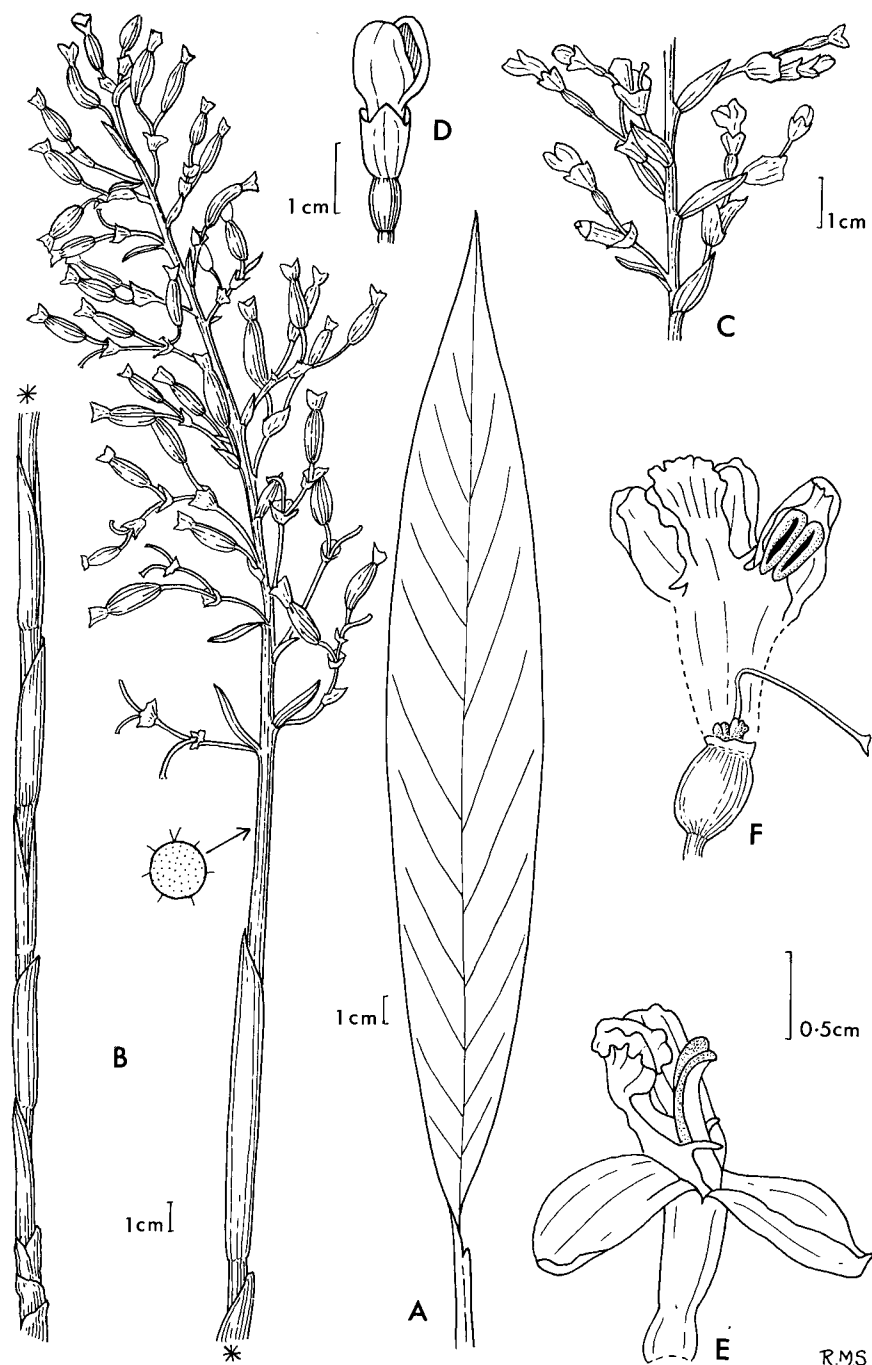


FIG. 7. *Renalmia pacifica*: A, leaf; B, inflorescence; C, detail of inflorescence; D, flower bud showing ovary, calyx and corolla; E, opened flower showing corolla, labellum, lateral staminodes and stamen; F, dissected flower showing ovary, nectarial glands, style, corolla, stamen and labellum. A from Rohweder 1229; B–F from Rohweder 1227.

ellipsoid v. 4–12mm and ellipsoid to globose), and by its distribution in Central America (Pacific slopes of Mexico, Guatemala and El Salvador v. Atlantic slopes of the same countries).

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