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New species of *Araceae* from Venezuela and the Guianas

Abstract

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Six species are described as new to science from NE South America: *Anthurium cremersii*, *Philodendron grenandii* and *P. jonkerorum* from the Guianas, *A. huberi* and *A. uasadiense* from the Guiana Highlands in Venezuela and *A. merlei* from the coastal range of NE Venezuela.

Additional key words: aroids, taxonomy, *Anthurium*, *Philodendron*, French Guiana, Suriname

Introduction

The *Araceae* of Venezuela and the Guianas are reasonably well-known owing to George Bunting who worked for many years on the aroids of Venezuela and published a key to the species of Venezuela, with diagnostic characteristics (but no full descriptions and with no illustrations) (Bunting 1979). Croat & Lambert (1986) published a revision of the *Araceae* of Venezuela which included an updated checklist as well as full descriptions of 171 of the 274 taxa occurring in Venezuela. Bunting further contributed to our knowledge of northeastern South America by publishing the *Araceae* for the Flora of the Venezuelan Guayana (Bunting 1995), which included 189 taxa. The region of the Guiana Highlands has also been studied and a review of the *Araceae* was published in the Flora of the Guianas Checklist (Croat 1992). Another work that covered this region in detail was the *Araceae* treatment in the Vascular Plants of Central French Guiana (Croat 1997), which includes 54 taxa and excellent illustrations. For Suriname most of the work was carried out by Anni M. E. Jonker-Verhoef and Fredrik P. Jonker who worked

out of the University of Utrecht in Holland (Jonker-Verhoef & Jonker 1953a–b, 1959, 1966, 1966, 1968).

A recent review of undetermined collections from the Guianas and Venezuela have resulted in the discovery of new species and these are described here.

Classification of the forest vegetation in the habitat notes of the new species follows Holdridge & al. (1971).

Anthurium cremersii G. S. Bunting ex Croat, **sp. nov.**
Holotype: French Guiana, Région de l'Inini, Mont Atachi Bacca, nord du plateau sommital, 10 km SE of Gobaya Soula, camp 1650 m, 53°55'W, 3°33'N, *J. de Granville & al. 10716* (MO 33656067; isotypes: B, G, MO, NY, P, U, US) – Fig. 1A–B.

Planta epiphytica; internodia 5–10 mm longa, 4–8 mm diam., cataphylla pro parte maxima decidua; folia petiolo subtereti, 10.4–16.3 cm longo, lamina elliptica, 8.7–13.4 cm longa, 5.9–9.2 cm lata, nervis primariis lateralibus 8–12 utroque; pedunculus 21.5–34.8 cm longus;

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spatha 2.8–3.4 cm longa, 0.5–1.2 cm lata; spadix viride-luteus, 4.6–12.8 cm longus.

Epiphyte, 30–40 cm high; *stems* short; *internodes* 5–10 mm long, drying 4–8 mm diam., scurfy, irregularly and closely fissured, dark brown to brown, frequently covered with debris and pieces of intact cataphylls and pale cataphyll fibres; *cataphylls* c. 5.5 cm long, moderately coriaceous, acute at apex, mostly breaking off, promptly weathering and mostly deciduous, sometimes with fragments of epidermis and a few pale fibres. *Leaves* with *petiole* subterete, 10.4–16.3 cm long (averaging 12.7 cm long), 1.1–1.6 × longer than blade, 3–4 mm diam., sheathed 1.5–3 cm; *geniculum* weakly sulcate, c. 1.5 cm long, scarcely distinguished from the rest of the petiole; *blade* ± elliptic, 8.7–13.4 cm long, 5.9–9.2 cm wide (averaging 16.6 × 7.1 cm), 1.8–2.3 × longer than wide, (averaging 2.2 ×), abruptly acuminate at apex, acute at base, subcoriaceous, drying dark brown above, brown below; *midrib* slightly raised, thicker and more prominent at the base, flattening out and narrowing towards the apex, somewhat convex and drying concolorous with the blade on the upper surface, somewhat flattened and slightly darker on the lower surface; *primary lateral veins* 8–12 per side, drying less conspicuous than the collective veins and scarcely more conspicuous than the interprimary veins, arising at a 40–55° angle; interprimary veins frequently branched; *collective veins* arising from one of the lowermost primary lateral veins, (3–)5–11 mm from the margins midway, sometimes loop-collecting the primary lateral veins; the upper surface minutely granular or areolate upon magnification with a sparse array of pale short lineations, a dense array of pale globular excrescences and a dense array of circular-raised gland-like structures, the latter also on the lower surface but much denser there. *Inflorescence* erect; *peduncle* 21.5–34.8 cm long (averaging 25.6 cm); *spathe* 2.8–3.4 cm long, 0.5–1.2 cm wide (averaging 3.3 × 0.85 cm), oblong-lanceolate, green, cuspidate-acuminate at apex, reflexed, drying dark brown, peduncle 6.6–10.2 × longer than the spathe (averaging 7.9 × longer); *spadix* greenish yellow, 4.6–12.8 cm long (averaging 8.3 cm) (reported to 20 cm in *de Granville & al.* 7598 but not seen), drying 2.3–3 mm diam. *Flowers* 3.3 mm long, 4.4 mm wide, 2–3 visible per spiral; lateral tepals 2.2 mm long, 0.8–1 mm wide, the margins broadly rounded and drying paler; stamens held just above the tepals, anthers 0.4 mm long, thecae broadly ovate, moderately divaricate. *Infructescence* to 10 cm long; *berries* orange to orange-red, c. 5 mm diam.

Anthurium cremersii is endemic to French Guiana (Cayenne) and is found only in the northwestern mountains at an elevation of 550–750 m in a Premontane wet forest life zone.

This species is a member of *Anthurium* sect. *Decurrentia* and has been confused with *A. lanjouwii* A. M. E. Jonker

& Jonker, a species from the same region with leaves of similar shape. The latter species differs, however, in having much larger leaf blades, drying yellow-green to yellow-brown, with 6–9 primary lateral veins and with the collective veins arising from about the middle of the blades. In addition, the spadix of *A. lanjouwii* is described as purple or purple tinged and has 5–7 flowers per spiral, whereas the spadix of *A. cremersii* is green or yellow-green and has 2–3 flowers per spiral.

The species was first collected in 1980 by George Cremers of ORSTOM in Cayenne and it is named in his honour. Dr Cremers was the head of the CAY herbarium 1976–1998 and has collected extensively in French Guiana. The senior author first met George Cremers in 1975 in Madagascar, where he was a senior botanist at the ORSTOM facility in Tananarivo between 1970 and 1975. He is now retired and, living in France, he still works on ferns and *Melastomataceae*.

Paratypes. — FRENCH GUIANA: Montagne Bellevue de l'Inini, extremite SW, 3°03'00"N, 53°35'00"W, 17.8. 1985, *de Granville* 7598 (B, MO); Montagnes de La Trinite–Bassin de La Mana, 4°35'42"N, 53°21'33"W, 600 m, 13.3.1997, *de Granville* 13320 (CAY, MO); Montagne de la Trinite, 4°35'12"N, 53°21'23"W, 550 m, 30.1.1984, *de Granville* 6386 (CAY, KEW, NY, P, U); Mt Kotika, 3°55'10"N, 54°11'10"W, 570 m, *C. Delnatte, N. Boudehri, S. Linares & O. Tostain* 1365 (CAY, MO).

Anthurium huberi G. S. Bunting ex Croat, **sp. nov.**

Holotype: Venezuela, Bolívar, Distrito Cedeno, Sierra de Maigualide, Río Chajura (afuente del Río Erebató), c. 100 km SW of Campamento Entrerios, 5°33'N, 65°13'W, 2100 m, 28.3.1988, *Huber* 12729 (MO 05094408; isotypes: MYF, US, VEN) – Fig. 1C.

Planta terrestris, internodia brevia, 1–1.5 cm diam.; cataphylla 2.5–4.5 cm longa, persistentia semi-intacta; folia petiolo 4.5–16.5 cm longo, tereti, lamina anguste ovato-cordata ad triangulari-ovata, 5.4–11.8 cm longa, 3.5–5.3 cm lata, nervis primariis lateralibus 4–6 utroque, nervis basalibus 2–3 utroque; pedunculus 8.5–19.3 cm longus; spatha 1.6–2.5 cm longa, 0.3–0.9 cm lata; spadix rubro-viridis vel purpureus, 1.5–3.5 cm longus.

Terrestrial herb over granitic substrate, 18–40 cm tall; *stems* erect to creeping; *internodes* shorter than wide or about as long as broad, 1–1.5 cm diam.; *cataphylls* 2.5–4.5 cm long, drying reddish brown, the uppermost intact, weathering partly to reddish fibres lower down, staying tight to stem along their length. *Leaves* with *petiole* 4.5–16.5 cm long (averaging 10.7 cm long), drying 1–2 mm in diam., terete, drying at least weakly sulcate adaxially and brownish and conspicuously granular-pustulate throughout, finely costate and warty-verrucose throughout; *geniculum* 7–10 mm long, drying slightly



Fig. 1. A–B: *Anthurium cremersii* – paratype specimen, Delnatte & al. 1365 (A), paratype specimen de Granville 6386 (B); C: *A. huberi* – isotype specimen at US, Huber 12729; D: *A. usadiense* – holotype specimen at US, Huber 12856.

thicker and darker than the remainder of the petiole; *blade* moderately coriaceous, narrowly ovate-cordate to triangular-ovate, acuminate at apex, prominently lobed at the base, *sinus* spatulate to narrowly V-shaped, arcuate on younger blades, sometimes completely closed with lobes overlapping in dried specimens, 5.4–11.8 cm long, 3.5–5.3 cm wide (averaging 8.8×4.3 cm), 1.5–2.7 × longer than wide (averaging 2 × long); upper surface dark green, semiglossy, sometimes glaucous, eglandular, drying greyish yellow-green; lower surface slightly paler, drying greyish green to yellowish brown, glandular-punctate (glands 0.1–0.2 mm diam., drying dark brown); *midrib* weakly raised and somewhat paler than surface upon drying, somewhat angular on upper surface, convex on lower surface; *primary lateral veins* 4–6 per side, scarcely more conspicuous than interprimaries, arising at a 55° to 70° angle, moderately straight to the collective veins; *collective veins* arising from the base, extending to the apex, very close to margin at the tip of the blade; *basal veins* 2–3 per side, prominently looped upward and merging with the margin. *Inflorescence* erect, at least as high or higher than the leaves, *peduncle* 8.5–19.3 cm long (averaging 14.5 cm long), drying 1–1.5 mm diam., becoming more tapered toward spadix; *spathe* light green, linear-lanceolate, 1.6–2.5 cm long, 0.3–0.9 cm wide (averaging 1.9×0.6 cm), acuminate at apex, rounded at base; *spadix* dark reddish green to purplish, matte, 1.5–3.5 cm long (averaging 2.7 cm long), drying 3–5 mm diam. *Flowers* 3–5 visible per spiral, drying 2.4–2.6 mm long, 1.6–2 mm wide, the outer margin bluntly triangular, inner margin broadly rounded, stamens maroonish brown, held at surface of tepals, the thecae broadly ovate, slightly divaricate. *Berry* colour unknown; immature berries developing at least sometimes only in lower $\frac{3}{5}$ of spadix.

Anthurium huberi is found in Venezuela (Bolívar, Amazonas) at an elevation of 2000 to 2150 m in a Premontane wet forest life zone.

Anthurium huberi is a member of an unknown section, perhaps *A. sect. Calomystrum*. It is most closely related to another species from the tepuis, namely *A. uasadiense* G. S. Bunting ex Croat (also published in this paper). Both species share similar glandular-punctate leaves and petioles that are finely costate and warty upon drying. *A. uasadiense* differs in having petioles much longer than the blades and in having larger, greyish yellow-green-drying blades. The blades also have more prominent rounded lobes and the sinus is spatulate with a larger gap than *A. huberi*.

Within the collections of *Anthurium huberi*, there are some variations. Specimen *Huber 13367* differs visually from both *Huber 12729* and *Berry & al. 4823* in that its blades are more narrowly triangular with a wider V-shaped sinus and less prominently rounded lobes. This may be due to the fact that this specimen was collected

as a more immature plant. The spadix on this specimen is also much smaller, which adds additional evidence to this assumption.

The species is named in honour of the Italian botanist-ecologist, Otto Huber, who first collected this small but elegant species in 1988 and whose contributions to the plant science of Venezuela are renowned. Dr Huber (born in 1944) made many studies in Venezuela, especially in the region of the tepuis.

Paratypes. — VENEZUELA: AMAZONAS: Departamento Atures, Sierra Maigualide, NW sector, small valley along an upper tributary of Caño Iguana, 5°30'N, 65°15'W, 2000 m, 28.2.–3.3.1991, *P. E. Berry, O. Huber & J. Rosales 4823* (MO); Río Asita, Sierra de Maigualide, 5°34'N, 65°13'W, 2150 m, 8.3.1996, *Huber & Riina 13637* (MO).

Anthurium merlei Croat, **sp. nov.**

Holotype: Venezuela, Sucre, Distrito Arismendi, Península de Paria, SE of Carúpano, NW of Maturincito, Cerro La Cerbatana, N slope, along trail between Caserio La Sierra toward Caserio Guárico, 10°38'30"N, 63°10'W, 800–900 m, 2.10.2005, *W. Meier, J. Wasmuth & S. Ramírez 11986* (MO 5939867–8; isotype: VEN) – Fig. 2A–C.

Planta hemiepiphytica; internodia 7–18 cm longa; cataphylla 14–20 cm longa, fibrosa pro parte; folia petiolo 62–77 cm longo, lamina plus minusve ovata, 54–101.5 cm longa, 32–54 cm lata, nervis primariis lateralibus 8–12 utroque; pedunculus 38–47 cm longus; spatha viridis vel cremea vel rubella, 17–23.5 cm longa, 3–12 cm lata; spadix roseus vel ruber, 19–21 cm longus, 1–1.5 cm diam.

Appressed-climbing hemiepiphyte, *stems* erect; *internodes* typically longer than broad, 7–18 cm long, 1.2–1.5 cm wide upon drying; *cataphylls* 14–20 cm long, drying reddish brown, persisting fairly tight on stem, intact closer to base, flaking off and exposing paler fibres from roughly middle to tip. *Leaves* with *petiole* 62–77 cm long (averaging 71 cm long), ribbed, thicker at base and narrowing as reaching petiolar plexus, 0.9 cm diam. on average just above petiolar plexus, drying darker than blade, sheathed 10–21.5 cm; *blade* ovate to narrowly ovate, 54–101.5 cm long, 32–54 cm wide (averaging 72.5×41 cm wide), 1.5–1.8 × longer than wide, 0.8–1.3 × as long as blade, somewhat coriaceous, narrowly ovate-cordate, acuminate at apex, prominently lobed at base, drying greyish to greyish yellow-brown above, greyish yellow-brown to greenish grey below; *sinus* narrowly hippocrepiform to broadly obovate; *midrib* prominently raised, narrowly rounded, drying yellow-brown and darker on upper surface, drying bluntly acute and yellow-brown below; *primary lateral veins* 8–12 per side, arising at an acute angle, then spreading at a 55–65° angle, with the angle decreasing as the

veins approach the apex, running parallel to each other and curving slightly towards the apex, then extending very close to the margin for some distance, drying narrowly raised and darker above, yellow-brown and darker than the surface below, much more prominent than the interprimaries; *basal veins* 6(–7) per side, regularly branching off posterior rib, the 1st and 2nd free to base, the 5th and 6th fused to 7–7.5 cm, radiating out moderately straight, curved upwards and merging with margin; *collective veins* arising from one of the uppermost primary lateral veins; tertiary veins prominulous. *Inflorescence* erect; *peduncle* 38–47 cm long; *spathe* spreading, green to cream with a tinge of pink or pinkish red or pink, 17–23.5 cm long, 3–12 cm wide, becoming very widely cordate at base at maturity; *spadix* erect, pink to reddish (pale green when immature), 19–21 cm long, 1–1.5 cm diam. *Flowers* (1.8–)2.4–2.6 mm long and wide, 11–12 visible per spiral; tepals conspicuously granular, lateral tepals 1.8–2 mm wide, the outer margin 2-sided, all tepals turned upward against the pistils upon drying; stamens barely emerging above the edge of the tepals at anthesis and apparently then retracted, c. 1 mm diam. *Berries* not seen.

Anthurium merlei is endemic to northeastern Venezuela (Monagas, Sucre) at an elevation of 750 to more than 1200 m in a Tropical moist forest life zone.

Anthurium merlei is a member of *A. sect. Belolonchium* and it is characterised by its epiphytic habit, moderately elongated internodes (for *A. sect. Belolonchium*), sometimes intact cataphylls, subterete petioles conspicuously sheathed at the base, the collective veins arising from one of the primary lateral veins, ovate to narrowly ovate-sagittate, yellow-brown drying blades with prominulous reticulate veins, a collective vein arising from one of the primary lateral veins near the apex and especially by the subcordate spathe and pink to reddish tapered spadix.

The species keyed out to *Anthurium macrourum* Sodiro in the Lucid key to *Anthurium* in the CATE *Araceae* treatment (Haigh & al. 2008, 2009). That species is endemic to the eastern slopes of the Andes in central Ecuador and differs in having short internodes (usually about as long as broad), blades with the collective veins arising from the 1st pair of basal veins and an inflorescence with the spadix 2–3 × longer than the spathe.

The species is named in honour of Mr Winifred Merle on whose property the species was collected. Mr Merle is a conservationist and is interested in preserving the local environment.

Paratypes. — VENEZUELA: SUCRE: Limit of Distrito Arismendi and Distrito Bermúdez/Benítez, Peninsula de Paria, SE of Carúpano, NW of Maturincito, Cerro La Cerbatana, along trail Camino Refugio to La Cumbre, 10°38'30"N, 63°10'W, 1.10.2005, W. Meier, M. Speck-

maier, T. Rennebarth & K. Muench 11143 (MO); *ibid.*, 2.10.2005, W. Meier, A. Berg & J. C. Quevedo 14328 (MO); La Cerbatana, along the trail west of the bifurcation, 900–950 m, 10°38'N, 63°10'W, W. Meier & P. Molina 10508 (MO). — MONAGAS: Cordillera de la Costa, E of Caripe, NE of Quebrada Grande, property of Rolf Struppek, 10°13'30"N, 63°25'W, 1200–1400 m, 19.3.2000, W. Meier, L. Cortez, R. Moran & D. Elsner 6572 (MO).

Anthurium uasadiense G. S. Bunting ex Croat, **sp. nov.**
Holotype: Venezuela, Amazonas, Dpto. Atures, Serranía Uasadi, sector nor-occidental, cumbres montañosas ubicadas en las cabeceras orientales de Río Asita, afluente derecho del Río Ventuari, 5°21'N, 65°12'W, 1850 m, 22.11.1988, O. Huber 12856 (US 3147947; isotypes: K, MO, MYF, VEN) – Fig. 1D.

Planta terrestris; internodia ad 2.3 cm longa; cataphylla 2.5–3.5 cm longa, persistentia semi-intacta; folia petiolo 28.5–41.3 cm longo, lamina anguste ovata, 14.7–16 cm longa, 7.8–9 cm lata, lobulis posterioribus 4.7–5.3 cm longis, nervis primariis lateralibus 3–5 utroque, nervis basalibus 4 utroque; pedunculus 39 cm longus; spatha viridis, 4.5 cm longa, 8 mm lata; spadix 8–10 cm longus, 8–10 mm diam., atroviridis.

Terrestrial, to 0.5 m tall; *stems* short or somewhat scandent; *internodes* short or to 2.3 cm long, drying 6–1.3 cm diam.; *cataphylls* 2.5–3.5 cm long, persisting semi-intact and red-brown. *Leaves* with *petiole* 28.5–41.3 cm long, 1.5–2 mm diam., 0.7–1.9 × as long as the blade, drying pale yellow-brown, matte, finely costate and weakly muricate throughout; *blade* narrowly ovate, 14.7–16 cm long, 7.8–9 cm wide, 1.8 × longer than wide, narrowly acute with a short apiculum at apex, prominently sagittate at base, dark green and matte above, drying greyish yellow and weakly glossy above, slightly paler and yellowish grey, weakly glossy below; *anterior lobe* 10.5–11.7 cm long; *posterior lobes* 4.7–5.3 cm long, directed toward the base; *sinus* obovate to spatulate, 4 cm long, 1.6–1.8 cm wide; *midrib* weakly raised and slightly paler above, more prominently raised and convex below, drying finely ridged and paler below; *primary lateral veins* 3–5 pairs, arising at a 70° angle, weakly raised above and below, straighter than interprimaries but not much more defined, joining the principal (uppermost) pair of collective veins; upper surface smooth and eglandular except for some bluntly raised tertiary veins; *lower* surface prominently dark punctate with irregularly shaped and irregularly sized plate-shaped gland-like structures, finely wrinkled upon magnification; *basal veins* 4 pairs, the lower 3 pairs curving along lobes and intersecting with the margin, uppermost pair curving up toward apex and merging with the margin near apex. *Inflorescence* erect, with *peduncle* 39 cm long, drying <2 mm diam. and costate-

warty like the petioles, upon drying, colored as petioles; *spathe* green, linear-lanceolate, reflexed, 4.5 cm long, 8 mm wide, rounded at apex with a short, blunt point; *spadix* 8–10 cm long, 8–10 mm diam., dark green with brownish maroon stamens. *Flowers* 4 per spiral, 2.2 cm long, 1.8 mm wide; lateral tepals 1.3–1.4 mm wide, the outer margins 2-sided, the inner margin broadly rounded; *stamens* clustered around pistil at apex of tepals, 0.15 mm long, 0.4 mm wide, anthers subrounded, slightly divaricate. *Mature berries* not seen, immature berries green, early emergent, developing in the lower 1/2 of the *spadix*.

Anthurium uasadiense appears to be a narrow endemic to Venezuela known only from the type locality in Amazonas State in the Department of Atures in Sierrania Uasadi at 1850 m in a Premontane wet forest life zone.

The species is a member of some unknown section, but perhaps an unusual member of *Anthurium* sect. *Urospadix*. It is characterised by its terrestrial habit, small size, short internodes, long-petiolate leaves, small, coriaceous, narrowly ovate-sagittate greyish yellow-drying blades with a narrow spatulate sinus and a long-pedunculate inflorescence with a reflexed green spathe and a long, narrow dark green *spadix*.

Anthurium uasadiense is closely related to *A. huberi*, another new species described in this paper from a similar region in the Department of Amazonas, Municipio Atures and in the same habitat, growing in the understorey of low forest and along riverine forests. Both species share similar petioles, which dry finely costate with a dense array of wart-like growths throughout their length. *A. huberi* differs in having petioles closer in length to the blade, smaller, more oval, less prominently lobed blades, which dry darker yellow-brown, and a sinus narrow or closed upon drying.

The species epithet “*uasadiense*” is coined from the type locality in the Serranía Uasadi.

***Philodendron grenandii* Croat, sp. nov.**

Holotype: French Guiana, Trois Sauts, Aval de Zidock ville, 4.2.1975, *Grenand 718* (CAY; isotype: CAY) – Fig. 2D.

Planta epiphytica; cataphylla 7.3–10.4 cm longa, semi-intacta; folia petiolo 12.3–20.5 cm longo, lamina anguste ovata ad ovato-elliptica, 19.6–27.3 cm longa, 5.3–9.9 cm lata, nervis primariis lateralibus 3–4 utroque; spathe 6.5–10.7 cm longa, lamina alba et tubo rubro; ovula 25–40 in quoque loculo.

Epiphyte, *stems* slender, elongate; *internodes* longer than broad, 7–10 mm diam., drying medium brown, smooth, matte, finely ribbed upon magnification; *cataphylls* weakly 2-ribbed, 7.3–10.4 cm long, drying red-

dish brown, remaining mostly intact, weathering partially to fibres near the base, finally deciduous. *Leaves* with *petiole* 12.3–20.5 cm long (averaging 16 cm), drying 2–3 mm in diam., sharply and broadly sulcate, drying darker than the blades, sheathed to about 2 cm at base but to 10–12 cm when subtending an inflorescence; *blade* 19.6–27.3 cm long, 5.3–9.9 cm wide, (averaging 23 × 7.9 cm) 2.9 × longer than wide, 1.4 × longer than the petiole, narrowly ovate to ovate-elliptic, asymmetrical with one side 0.9–1.3 cm wider, acuminate at apex, inequilateral and rounded to weakly subcordate at base, sometimes weakly decurrent onto petioles, dark green and matte above and lighter green underneath, drying yellowish to yellow; upper surface drying minutely granular upon magnification with a sparse array of short, pale, linear cellular inclusions; lower surface drying weakly glossy to matte with a dense array of somewhat darkened speckles; *midrib* flattened upon drying, somewhat raised on the upper surface, drying lighter than the blade on the lower surface; *primary lateral veins* 3–4 per side, arising at a 50 to 60° angle, curving upwards as they reach the margin; minor veins fine, close, moderately visible and weakly raised upon drying. *Inflorescence* with *spathe* 6.5–10.7 cm long, moderately constricted above the tube, tube 4.5 cm long, red on outside, blade white; *spadix* white; pistillate portion (post-anthesis) 3 cm long, 2.7 cm diam.; staminate portion 4.5 cm long, 1 cm diam.; sterile staminate portion c. 5 cm long, 1 cm wide; pistils 6.5–7.5 mm long, 3.2–3.6 mm diam., 5–6-locular, placentation axile, style weakly sunken at each division of the locules, stigma somewhat sunken, button-shaped, 1–1.2 mm diam., with 5–7 equidistant pits around its circumference; ovules 25–40 per locule, 1.3 mm long, the funicle 0.2 mm long.

Philodendron grenandii is endemic to French Guiana, known only from the eastern part of the country at an elevation of 300–450 m in a Tropical moist forest or Premontane wet forest life zone. *P. grenandii* is known from only two collections, one made near the Brazilian border at Trois Sauts and the other at Huat Oyapock on Mt St. Marcel at 350–400 m.

The species is a member of *Philodendron* subg. *Philodendron* sect. *Philodendron* but its further classification is uncertain. It seems to have greatest affinity with *P.* subsect. *Platypodium* (Schott) Engl. despite its narrow blades, which are inequilaterally rounded to weakly subcordate at the base. *P. grenandii* is characterised by its elongated internodes, its broadly sulcate petioles, the narrowly ovate to ovate-elliptic, greenish yellow-brown drying blades, which are narrowly rounded to weakly subcordate at the base, as well as by its inflorescences with a red tube and white blade.

The species is perhaps related to *Philodendron fragrantissimum* (Hook.) G. Don owing to the dried colour of its blades and the colour of the inflorescence. Howev-



Fig. 2. A–C: *Anthurium merlei* – paratype specimen Meier & al. 14328 (A); holotype specimen at MO, Meier 11986, sheet 1 (B), sheet 2 (C); D: *Philodendron grenandii* – paratype specimen at CAY, Sastre 4445.



Fig. 3. *Philodendron jonkerorum* – holotype specimen at NY, Daniels & Jonker 773.

er, *P. grenandii* has oblong blades that are much longer than wide, while *P. fragrantissimum* has more cordate-shaped blades with a wider base. The species has also been confused with *P. splitgerberi* Schott, a poorly known species that differs in having narrowly ovate-triangular subcordate blades with a broadly arcuate winged petiole.

Philodendron grenandii is also easily confused with *P. ushanum* Croat & Moonen (especially in living condition) in being an appressed-climbing vine with internodes longer than wide, by having narrowly ovate-oblong, narrowly acuminate blades which are narrowly rounded to acute at base as well as in having small solitary inflorescences. That species differs in having blades that dry greyish green to dark grey or blackened rather than pale greenish grey to yellowish brown as in *P. grenandii*. In addition, the stem of *P. ushanum* has a yellow-brown and conspicuously sulcate-ridged epidermis, whereas the stem of *P. grenandii* is smoothly terete and minutely finely ribbed.

The collection by *Sastre 4445* differs in having the petioles sheathed nearly to the apex, whereas the *Grenand 718* collection has most of the petioles scarcely sheathed except for the petiole subtending the inflorescence. There are also minor differences in the epidermis on both surfaces between these two collections but they may be unimportant.

A collection from the Serra dos Carajás (*Daly & al. 1856* at MG) in the state of Pará represents a similar species, which appears to be related. It has narrowly ovate, subcordate blades with a similar, small red inflorescence. It differs not only in its much broader blades but the upper surface is minutely granular and covered with short pale-lineate cellular inclusions.

The species is named in honour of Pierre Grenand of the ORSTOM Herbarium in Cayenne (CAY). Dr Grenand's interests include anthropology, ethnobotany and pharmacology and he made the collection in conjunction with his work in French Guiana.

Paratype. — FRENCH GUIANA: Huat Oyapock, Mt St. Maral, 350–440 m, 20.3.1977, *C. Sastre 4445* (CAY).

***Philodendron jonkerorum* Croat, sp. nov.**

Holotype: Suriname, Emmaketen Mts, on granitic boulder in creek 500 m E of main camp, 350 m, 29.7.1959, *Daniëls & Jonker 773* (NY; isotype: U) – Fig. 3.

Planta epipetrica; internodia brevica; folia petiolo 48–49 cm longo, lamina ovato-cordata, 34 cm longa, 28–30 cm lata, lobulis posterioribus 12.5–14.5 cm longis, nervis basalibus 7–8 utroque, nervis lateralibus primariis 4–5 utroque; pedunculus 5–5.5 cm longus; spathe 14–19.5 cm longa, viridis extus, lamina lutea intus, tubo rubro intus; spadix pistillatus, 8.3 cm longus; ovula 15–20 in quoque loculo.

Epipetric; stems erect; internodes moderately short; cataphylls not seen. Leaves with petiole 48–49 cm long, drying dark brown, 5 mm diam. midway, sheathed to about 10 cm at base (at least when subtending an inflorescence), green-verrucose in lower 1/3, becoming more conspicuously club-shaped scaly toward the apex (these somewhat denser toward the apex); blade ovate-cordate, 34 cm long, 28–30 cm wide, subcoriaceous, acuminate at apex, conspicuously cordate and broadest at the base, dark green and matte above, moderately paler and semiglossy below, drying grey-green above, greenish brown below; sinus broadly hippocrepiform, to 8.5 cm deep; anterior lobe 26.5 cm long, nearly straight along most of its margin; posterior lobes 12.5–14.5 cm long, 9–10 cm wide; midrib flattened, drying somewhat darker than surface above, narrowly rounded and drying much darker than the surface below; basal veins 7–8 per side, 1st–2nd free to base, the 3rd almost free, the 5th–6th coalesced 4.3 cm, drying narrowly rounded and much darker than the surface; posterior rib naked throughout most of its length; primary lateral veins 4–5 per side, arising at a 30–45° angle, drying dark brown, darker than the surface; minor veins drying moderately distinct, in part wrinkled. Inflorescence with a peduncle 5–5.5 cm long; spathe 14–19.5 cm long, green outside, blade yellowish inside, tube red inside; spadix with pistillate portion 8.3 cm long, 2 cm diam. midway, 1.2 cm diam. at apex; staminate portion 8–8.2 cm long, 9–10 mm diam. at base, to 1.2 cm diam. in upper 1/3; pistils 3.5 mm long, 2.5 mm diam.; locules 5; ovules 15–20 per locule, 1 mm long, 0.2 mm diam.; placentation axile, the ovules dispersed along the entire length of the locule.

Philodendron jonkerorum is endemic to Suriname and is known only from the type locality from the Emmaketen Mountains found at an elevation of 350 m in a Premontane wet forest life zone.

Philodendron jonkerorum is a member of *P.* subg. *Philodendron* sect. *Philodendron* subsect. *Psoropodium* and is characterised by its narrowly ovate-sagittate blades, which are grey-green on the upper surface and yellowish grey on the lower surfaces, and by its petioles, which are conspicuously glandular in the upper half.

The species is similar to *Philodendron squamiferum* Poepp. & Endl., another species with scaly petioles found in Suriname at similar elevations. *P. jonkerorum*, however, has a very different and distinct blade shape as well as fibres that run the entire length of the petioles. The species should be compared also with *P. ornatum* Schott, yet another species that has petioles bearing warty structures and is also found in Suriname within the same elevational range. That species differs in having much larger blades, petioles that have much shorter, more blunt, warty excrescences, mostly restricted toward the apex of the petioles.

The species is named in honour of Anni M. E. Jonker-Verhoef and her husband Fredrik P. Jonker who jointly worked on the *Araceae* of Suriname. Together they published several new species for the Guiana region.

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