

# New Species of *Philodendron* (Araceae) in the Guianas

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## ABSTRACT

Three new species of *Philodendron* (Araceae) are described and illustrated from the Guianas including, *P. ayangan-nense* Croat and *P. kaieteurense* Croat that are from Guyana and *P. pokigronense* Croat that is from Suriname.

## KEY WORDS

Araceae, French Guiana, Guianas, Guyana, new species, *Philodendron*, Suriname.

## INTRODUCTION

During recent National Geographic Society sponsored expeditions to the Guianas from January to March and August to September 2011, more than 1884 collections (including 5721 specimens) with 817 collections of Araceae were collected. Among them were four new species of *Philodendron* that are described below.

Although some collections, particularly specimens of *Philodendron* subgen. *Pteromischum*, remain undetermined, good estimates of the total flora are now available. The Araceae for the *Flora of the Guianas* has 163 species with a very

unequal distribution. Guyana with 78 species has the lowest number of species perhaps owing to its extensive areas of savanna, these being notoriously poor in species of Araceae. Suriname has 101 species and French Guiana has 132 species. French Guiana is the richest in species perhaps owing to its much more extensive expanse of primary vegetation. The area has a very low population and very little agriculture since much of the population works for the government, or are on subsistence support from the French government. Some of the new species and new records for French Guiana have come from the region near the Brazilian border and are thus species not ranging into adjacent Suriname.

It is interesting to note that the Flora of the Guianas is much less species-rich than areas in the Andes. The Guianas with 163 species in an area of 179, 000 sq. miles contrasts poorly with Ecuador, for example. Ecuador has only 104,510 sq. miles but has a flora of 943 published species, making it almost 12 times richer per unit area. However, the Flora of the Guianas does have a significantly endemic flora with 23 naturally occurring genera including 4 genera endemic to the Guianas, and a

total of 50% of the species in the Guianas are endemic to the Guianas. A total of 71 species (44% of the total) are endemic to eastern South America.

***Philodendron ayangannense*** Croat, **sp. nov.** Type: GUYANA. Potaro-Siparuni Region; Mt. Ayanganna, east face, area near camp at base of second of four encampments, 05°22'22"N, 59°57'34"W, 1,120 m, dense forest on sandstone and peat, with *Clusia*, *Euterpe* and *Socratea*, 28 June 2001, *H. D. Clarke, R. Williams, C. Perry, E. Tripp & J. Kelly 9605* (holotype, MO-5706847; isotypes, BRG, US). Fig. 2 A.

The species is most similar to *Philodendron hebetatum* Croat from Central America and the western slopes of the Cordillera Occidental in Colombia and Ecuador but that species differs in having thicker glossy petioles with yellow-brown epidermis frequently loosened on drying, lower blade surfaces with distinctly visible minor veins and prominently visible laticifers, pale yellow-brown dried primary lateral veins (not darker as in *P. ayangannense*).

Epiphyte; **internodes** short; **cataphylls** 1-ribbed 7–12 cm long; **petioles** 59.8–66.5 cm long, 6 mm diam., terete with narrow ridges, extremely warty at tip, minutely transversely ridged, drying dark brown. LEAVES with **blades** narrowly triangular-ovate-sagittate, 52.2–62 cm long, 30.2–40 cm wide, 1.55–1.73 times longer than broad, broadest below petiole attachment, 0.9–1.1 times longer than petioles, abruptly acuminate at apex, markedly bicolorous, drying subcoriaceous, areolate-ridged, yellowish brown and semi-glossy above, whitish brown, smooth and matte below, epunctate; **anterior lobe** 38.7–45.7 cm long, with straight to slightly concave margins in lower half of anterior lobe, the distal margin rounded; **posterior lobes** 21.8–23 cm long, 11.2–17 cm wide, directed downward and inward; **midrib** drying flattened and darker above, narrowly rounded, finely ribbed and darker below; **primary lateral veins** 5–6 pairs, arising at 75° angle, drying flattened,

concolorous above, round-raised and darker below; **minor veins** arising mostly from midrib but also from the primary lateral veins closer to margins, drying obscure above and moderately visible and distinct below; **laticifers** presumably lacking; **basal veins** 8–9, 4 pairs acroscopic, 4–5 pairs basioscopic, 1<sup>st</sup> pair free to base, 2<sup>nd</sup> pair fused to 2.4 cm, remainder fused to 6.2 cm; **posterior rib** gradually curved, naked 3 cm; **sinus** broadly spatulate, 13.7–17.5 cm deep, 7.5–8.1 cm wide. INFLORESCENCES with **peduncle** 7.1–11 cm long; **spathe** green, maroon at base, 9.5–12.5 cm long, 1.9–2.3 cm wide, oblanceolate, drying coriaceous, reddish brown; **spadix** 9.5–10.6 cm long, drying reddish brown; pistillate portion 3–3.5 cm long in front, 2.5–2.7 cm long in back, 7 mm diam. at middle; staminate portion (5.2–)6.5–7 cm long, 10–13 mm diam. at middle, gradually tapered to apex, slightly narrower toward base; sterile staminate portion 2.1 cm long, 1.3 cm long, 1.1 cm diam. midway, slightly narrower toward the apex and the base, drying slightly brownish; pistillate portion 3.3 cm long, ca. 1 cm diam.; pistils 2–2.1 mm long, 0.8 mm diam., narrowed into a style ca. 0.5 mm long, (4–) 5–6-locular; stigma subglobular, ca. 1.2 mm diam. with prominent spreading papillae; ovary ca. 1.3 mm long; ovules 1 or 2 borne in each transparent envelopes, these 1.2 mm long, the funicles about as long as the ovule, the lower half of funicle densely glandular; ovules basal, 1–2 per locule, 0.8–1.0 mm long, funicle about as long as ovule.

*Philodendron ayangannense* is endemic to Guyana, known only from the type locality in the Potaro-Siparun Region on Mount Ayanganna at 1,120 m in a *Montane wet forest* life zone (Holdridge et al., 1971).

The species is a member of subgen. *Philodendron* sect. *Macrobelyum*, subsect. *Glossophyllum*, series *Ovata* characterized by its epiphytic habit, narrowly triangular-ovate-sagittate, markedly bicolorous blade with the lower surface almost whitish with one free basal pair of veins and a well-developed posterior rib and a broadly spatulate sinus as well as by the spathe which is green in the apical half and red on the tube portion.



Fig. 1. A–B. *Philodendron kaieteurense* Croat. (Croat 101890). A. Habit top view. B. Habit in side view. C–D. *Philodendron pokigronense* Croat. (Croat 102167). C. Habit of plant in tree. D. Close-up of inflorescence.

The species is named for the type locality on Mt. Ayanganna in Eastern Guyana.

***Philodendron kaieteurense* Croat, sp. nov.** Type: GUYANA. Region 8: Potaro-Siparuni basin, Upper Potaro River, vicinity of Kaieteur waterfalls, along trail through forest from waterfalls to Tukeit (below falls), 05°10'52"N, 59°10'52"W to 59°28'29"W, 451–452 m, high forest with ample shade over sandstone and loose sandy soil with large sandstone boulders present, 22 Jan 2011, T. B. Croat 101890 (holotype, MO-6300397; isotypes, AAU, B, BBS, BRG, CAY, CAS, F, G, INPA, K, L, M, NY, P, RB, US, VEN). Figs. 1 A–B, 2 B–D, 3 A.

The species is most similar to *Philodendron melinonii* Brongn. ex Regel which differs in having much larger, more conspicuous cataphylls which persist in a large mass, petioles which are more sharply and broadly

sulcate with the margins bluntly and prominently raised, blades which are proportionately narrower (1.3–)1.5–1.8 times longer than broad) and are conspicuously short-pale-lineate above and usually with prominent cross-veins on the lower surface.

Epiphytic or on large sandstone boulders; **internodes** short, to 3.0 cm diam.; **cataphylls** 8–10 cm long, bluntly 2-ribbed, pale green, persisting as red-brown fibers with fragments of epidermis; **petioles** 7.5–17.5 cm long, somewhat spongy, obtusely D-shaped, broadly sulcate to narrowly or obtusely sulcate adaxially, medium green, matte to weakly glossy, finely striate with purple spots around the circumference on the sides and abaxial surface, drying dark brown, matte; geniculum not apparent. LEAVES with **blades** oblong-elliptic, oblong-lanceolate to rarely subcordate, 36.2–45.5 cm long, 11.5–16 cm wide, 2.8–3.4 times longer than broad, 2.5–4.8 times longer than petioles, slightly inequilateral



Fig. 2. A. *Philodendron ayangannense* Croat. (*H.D. Clarke 9605*). A. Herbarium type specimen. B–D. *Philodendron kaiteurense* Croat (*Croat 101890*). B. Showing leaf blade adaxial surface. C. Base of leaf, adaxial surface. D. Stem, petiole bases and inflorescences.

(one side to ca. 1 cm wider), acute to rounded or weakly subcordate at base, subcoriaceous, dark green and semiglossy above, moderately paler and glossy below, medium green or rarely heavily tinged violet-purple (if so the major veins medium

green) below, drying dark brown & matte to weakly glossy above, grayish brown and semiglossy below; **midrib** narrowly and obtusely sunken medially, somewhat discolored along its margins above, narrowly rounded and paler below, drying slightly



Fig. 3. A. *Philodendron kaieteurense* Croat. (Croat 101890). A. Petiole bases and cataphyll fibers. B–D. *Philodendron pokigronense* Croat. (Croat 102167). B. Habit of plant lying on fallen tree. C. Leaf blade adaxial surface. D. Inflorescence with cut away spathe on abaxial surface.

darker than surface above, moderately darker and matte below; **primary lateral veins** 5–7, arising at a steep angle then spreading at  $35^{\circ}$ – $45^{\circ}$ , obtusely sunken and concolorous, weakly quilted above,

narrowly rounded and paler to concolorous below, drying concolorous and sometimes undulate above, much darker and weakly raised below; basal veins 1–2: minor veins weakly etched and concolorous above,

scarcely raised and moderately distinct and rather widely spaced below; **upper surface** drying smooth above, sparsely very short-lineate above, smooth below, lacking pale lineations. INFLORESCENCES 1–2 per axil; **peduncle** to 7 cm long, 1.2 cm × 9 mm wide; **spathe** medium green, faintly tinged reddish in distal 3 cm, densely and faintly pale-speckled-lineate throughout outside, pale green and glossy throughout inside, 13.3 long and 2.3–2.8 cm diam.; **spadix** 11–12.8 cm long; pistillate portion pale yellow-brown, oxidizing black, 2.0–2.7 cm long in back, 2.5–3.6 cm long in front; staminate portion (6.4–)7.9–8.7 cm long, 1.7 cm diam. on broadest part, 1.4–1.5 cm diam. at constriction; sterile portion creamy tan 1.1–2.7 cm long, 1.6–1.8 cm diam., becoming cloudy gray with smaller flowers in distal 3–6 mm in age, those in the lower portion often elongated in the direction of the axis; fertile staminate portion spadix aging dark yellow-brown or sometimes grayish yellow-brown, 2–2.3 cm long, 1.2–1.3 cm diam., frequently very sticky; the apical portion of the staminate spadix an appendix narrowly to rather broadly rounded at apex, 2–3.4 cm long, 2.4–2.5 cm diam., aging creamy gray and clearly demarcated from the rest of the spadix, usually markedly irregular at the base and raised, thicker than the rest of the spadix; pistils 5–6-locular, ovules ca. 1 mm long, attached near the base with funicles as long as or longer than the ovules.

*Philodendron kaieteurense* is endemic to Guyana, known only from the type locality in the Pakaraima Mountains in Region 8, in the Potaro-Siparuni basin in the basin of the Upper Potaro River in the vicinity of Kaieteur waterfalls at 451–452 m in what appears to be a *Tropical moist forest* or *Premontane wet forest* life zone.

The species is a member of subgen. *Philodendron*, sect. *Macrolonchium* characterized by its epipetric habit, short internodes, bluntly 2-ribbed cataphylls that persist as red-brown fibers with fragments of epidermis, obtusely D-shaped to broadly sulcate, somewhat spongy petioles, narrowly oblong-ovate blades with the base obtuse to subcordate, as well as by the medium green spathe, faintly tinged reddish

in distal 3 cm and densely and faintly pale-speckled-lineate throughout outside, pale green and glossy throughout inside.

The species is named for the type locality at the Kaieteur Falls in Guyana.

***Philodendron pokigronense* Croat, sp. nov.** Type: SURINAME. Sipaliwine: Vicinity of Atjoni, along Suriname River, ca. 1 km S of Pokigron; virgin forest and edges, 04°23'32"N, 55°22'31"W, 63 m, *T. B. Croat & G. Ferry 102167* (holotype, MO-6318046; isotypes B, BBS, BRG, CAS, CAY, F, INPA, K, L, M, NY, S, SEL, TEX, US). Figs. 1 C–D, 3 B–D.

The species has no apparent close relatives but would key to *Philodendron panduriforme* (Kunth) Kunth which differs in having blades drying blackened with more deeply lobed margins and by having only 1–2 inflorescences per axil, or *P. bipennifolium* Schott which differs in being more deeply lobed and in having a single, much larger inflorescence.

Hemiepiphytic to 5 m; **internodes** 2.2–3.7 cm long, 1–2.2 cm diam., medium-dark green, weakly glossy, soon gray-brown, eventually yellow-brown, drying 1.1–1.3 cm diam.; **cataphylls** unribbed to 1-ribbed, 10–15 cm long, deciduous, drying dark reddish brown; **petioles** somewhat spongy, 33–37 cm long, 1–1.2 cm diam. midway, medium green, densely short-dark-lineate, obtusely flattened at base adaxially, sheathed 5–6 cm, bluntly 1-ribbed, midway adaxially more or less flattened toward apex with broad sulcus at apex, rounded abaxially, drying 25.8–31.9 cm, olive dark brown. LEAVES: **juvenile blades** broadly lanceolate occasionally with one margin constricted to 20.4 cm long, 7.8 cm wide, abruptly acuminate at apex; **preadult blades** panduriform, to 29.2 cm long, 17.2 cm wide, abruptly acuminate at apex; **blades** somewhat panduriform, 31–39 cm long, 17–36.5 cm wide (averaging 36 × 22), 1.63–1.67 (averaging 1.65) times longer than broad, 1.16–1.34 (averaging 1.25) times longer than petioles, 17–36.5 cm wide across

lateral lobes, 8–14 cm wide across constricted portion, 11.8–17 cm wide across medial lobe, abruptly acuminate at apex, subcordate at base, subcoriaceous, dark green, weakly glossy above, moderately paler and semiglossy below, lateral lobes 9–13 cm long and 6–10 cm wide, blade drying olive-brown to blackish brown and weakly glossy above, olive-brown blackish brown and semiglossy below, epunctate; **upper surface** drying irregularly and narrowly ridged, sparsely pustular; **lower surface** drying conspicuously irregularly flattened pustular; **midrib** broadly convex and slightly paler above, narrowly rounded and weakly paler below, drying narrowly raised, finely ribbed and slightly darker above, broadly convex, finely ribbed and darker below; **primary lateral veins** 6 per side, arising at 60–65° angle, drying moderately obscure, 3-ribbed and concolorous above, broadly convex, finely ribbed and darker below; **minor veins** arising mostly from midrib but also from the primary lateral veins closer to margins, drying prominently raised and irregular above and moderately visible, ridged, pustular, granular below; **laticifers** short and moderately obscure below; **basal veins** 2 (–3) pairs; **sinus**, when present, arcuate or arcuate-decurrent on petiole 1–2 cm deep. INFLORESCENCES 9 per axil; **peduncle** 10.5 cm long, 7 × 9 mm diam., brownish, semiglossy; **spathe** medium green, heavily tinged with red, especially on open edge of spathe, 1.5–12.0 cm long, 1.2–1.9 cm diam. on tube, scarcely, clearly demarcated from peduncle, olive-green to medium yellow-green outside on blade, inner surface of spathe medium green and glossy, tinged with red on one edge of tube, stipe red, drying a reddish dark brown; **spadix** to 10 cm long, 8–9 mm diam. in middle, 7–8 mm at apex, medium yellow-green, semiglossy; staminate part, 6.5 cm long, 7 mm diam. at base, scarcely constricted;

the sterile part white, 8 mm long, scarcely distinguishable; fertile spadix creamy-white; female portion, 4 cm long in front, 3.6 cm long in back, 9 mm diam. at base, 7 mm diam. at apex, drying blackish brown; pistils cylindroid-elliptic, 1.6–1.8 mm long, 1.3–1.4 mm diam., style bluntly 4–5-sided, the margins narrowly rounded; stigma button-shaped, 0.4 mm diam. with a medial depression and drying with a thin mantle nearly as broad as the apex of the style; locules 5–6 each containing one translucent envelope with 1 ovule; ovules basal, the ovule and funicle together 0.75 mm long, the funicle and ovule equally as long, 0.35–0.40 mm long, contained within a gelatinous matrix. Mature berries not seen.

*Philodendron pokigronense* is endemic to Suriname, known only from the area to the west and southwest of Lake Brokopondo in Sipaliwini and Brokopondo Districts at 60–65 m elevation in what is probably a *Tropical moist forest* life zone.

The species is a member of subgen. *Philodendron* sect. *Macrobelum* subsect. *Glossophyllum*, series *Ovata* characterized by its hemiepiphytic habit, internodes slightly longer than broad, 1-ribbed to unribbed cataphylls, subterete petioles, panduriforme olive-brown drying leaf blades with a subcordate base as well as by the cluster of up to 9 inflorescences per axil with the spathe green heavily tinged with red and clearly demarcated from the peduncle.

The species is named for the type locality near Pokigron in Sipaliwini District of Suriname.

#### LITERATURE CITED

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