New Species of *Philodendron* (Araceae) from South America

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ABSTRACT

The following new species are described: *Philodendron aureimarginatum* Croat, *P. campii* Croat, *P. clarkei* Croat, *P. moonenii* Croat, *P. paucinervium* Croat, *P. sparreorum* Croat and *P. werkhoveniae* Croat.

KEY WORDS

South America, new species, *Philodendron aureimarginatum, Philodendron campii, Philodendron clarkei, Philodendron. moonenii, Philodendron paucinervium, Philodendron sparreorum,* and *Philodendron werkhoveniae.*

Philodendron aureimarginatum Croat, **sp. nov.** Type: PERU. Dept. Loreto: Prov. Maynas, Dtto. Iquitos, Puerto Almendra, near Río Nanay, 3°48'S, 73°25'W, 122 m, 29 Nov. 1976, *Juan Revilla 1972* (holotype, MO–2610359; isotypes, F, USM). Figures 1–3.

Planta hemiepiphytica; internodia adulta brevia, 5–8 cm longa, ad 3.5 cm diam.; cataphylla 15–17 cm longa, mox decidua; petiolus (9)15–24(36) cm longus, obtuse sulcatus; lamina anguste oblongo-ovata vel oblanceolato-elliptica, 54–75 cm longa, 12–27 cm lata; nervis primariis lateralibus 7–9 utroque; inflorescentia 1 in quoque axilla; pedunculus 2–6 (rarius ad 23) cm longus; spatha viridis vel alba, (10)12–14 cm longa, 2.5 cm diam.; spadix 11.5–13.5 cm longus; parte pistillata 3.5–4 cm longus; baccae aurantiacae vel rubrae.

Appressed-climbing hemiepiphyte; **internodes** 5–8 cm long, 1 cm diam. at lower nodes, 2–2.5 cm diam. near apex, drying yellow-brown, glossy, longitudinally folded, to 6 mm diam.; **cataphylls** 15–17 cm long, seemingly unribbed, persisting semi-intact at upper nodes on larger stems, drying dark brown, soon weathering to slender, reddish brown fibers, these also mostly deciduous. LEAVES with **petioles** (9)15–24(36) cm long, typically shorter than the blades, thicker than broad and obtusely sulcate adaxially, 0.5–1 mm diam.; **blades** narrowly oblong-ovate to weakly oblanceolate-elliptic, 54–75 cm long, 12–27 cm wide, broadest at or slightly above the middle, 2.7–4 times longer than wide, 1.1–2.6 times longer than petioles, abruptly acuminate at apex, narrowly acute to truncate to subcordate (rarely cordate) at base; upper surface drying grayish to grayish brown, with inconspicuous scattering of short, whitish, raphide cellular inclusions; lower surface drying dark yellowish brown, with inconspicuous areolate pattern of depressions; both surfaces drying matte, with a thickened, more or less hyaline, yellowish brown, submarginal band 1.5–2 mm wide, this thicker and more elevated on the lower surface; margins thin, revolute; sinus (when present) arcuate, to 7 cm deep; major veins drying blackened on lower surface; **midrib** flat on upper surface, thicker than broad on lower surface, drying acute; **primary lateral veins** 7–9 pairs, arising at a very acute angle then spreading at 30–45° angle to the margin; interprimary veins usually 1 between each pair of primary lateral veins

and only slightly less prominent; **basal veins** 2–4(5) per side, free to base or nearly so, the uppermost arising at 10–20° angle, the lowermost spreading to as much as 90° angle or reflexed. INFLORESCENCES apparently 1 per axil; **peduncles** mostly 2–6 cm long, rarely to 23 cm long in fruit, drying 4–10 mm diam.; **spathe** green, sometimes white at anthesis, (10)12–14 cm long, to 2.5 cm diam. on tube; **spadix** 11.5–13.5 cm long; pistillate portion 3.5–4 cm long, drying 10–13 cm diam.; male portion 9.7 cm long; sterile male portion 6 mm long, 8–13 mm diam.; fertile male portion drying 7–12 mm diam., the constricted portion 6.5–10 mm diam.; ovaries (7)9–10(12)-locular; **ovules** ca. 5–6 per locule. INFRUCTESCENCE apparently 7 cm long, 3.5 cm diam.; **berries** bright orange to red, the persistent styles 1.2–1.6 mm diam., annular, with the margins paler and with distinct stylar depressions, conspicuously depressed and darker medially; seeds drying dark brown, 1 mm long, 0.4 mm diam.

Philodendron aureimarginatum is a member of *Philodendron* sect. *Calostigma,* subsect. *Macrobelium* and is known only from Ecuador and Peru, in the drainage of the Río Napo. Most of the collections are from the Iquitos area, occurring in areas of white sand soil, at less than 150 m elevation, in an area of *Tropical moist forest* (bh-T). The species is characterized by its somewhat elongated blade, usually rounded to subcordate at the base, and especially by the conspicuous, more or less hyaline blade margins. The species almost certainly occurs also in Acre, based on *Croat 85685* from near Cruziero do Sul, but the specimen has not been compared with other material because it has never been sent from Brazil. If it does indeed prove to be the same species, it is important to note that this collection had at least two inflorescences per axil.

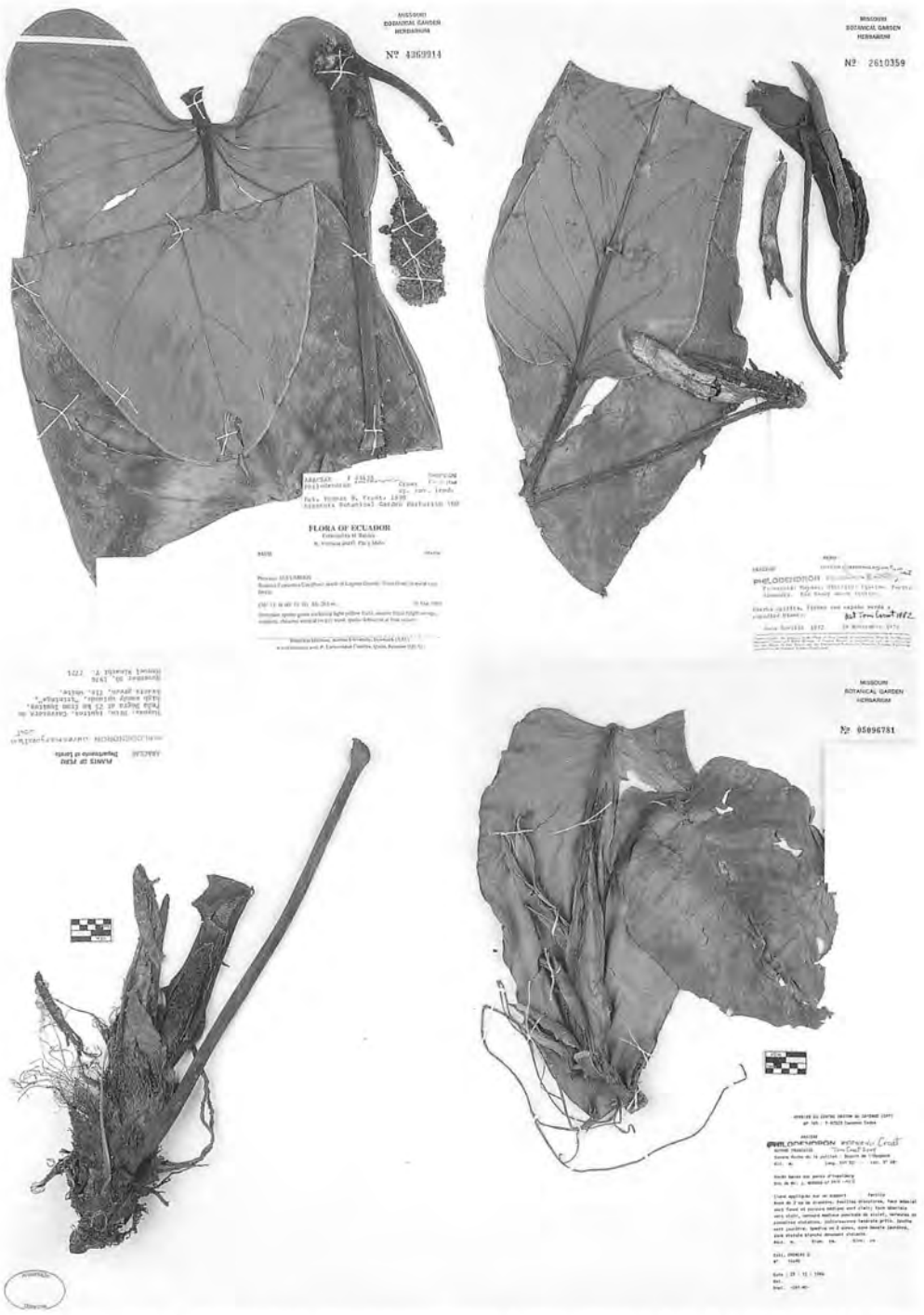
Philodendron aureimarginatum is most similar to *P. wittianum* Engl., a species with similar blade shape. That species differs in having shorter internodes, cataphylls that usually persist on the stem and blades that lack hyaline margins.

Balslev 84636 is atypical in having a much more deeply cordate leaf base but otherwise, has the typical features of the species, including the unusual leaf margin.

Paratypes—ECUADOR. **Sucumbíos**: Reserva Faunistica Cuyabeno, N of Laguna Grande, 0°01′N, 76°11′W, 265 m, 26 Mar. 1989, *Balslev et al. 84636* (MO). PERU. **Loreto**: Distrito Iquitos, Puerto Almendras, 29 Nov. 1976, *Revilla 1972* (F, MO, USM); Maynas Province, Distrito Loreto, Carretera de Peña Negra, 25 km from Iquitos, 30 Nov. 1976, *Rimachi 2721* (IMB): Carretera Peña Negra, 2 km beyond Quista Cocha, 5 Jan. 1979, *Rimachi 4185* (MO); Pto. Almendras, Río Nanay, near Iquitos, 120 m, 3°45′S, 73°15′W, 120 m, 3 Jan. 1981, *Vasquez & Jaramillo 1156* (MO, USM); Puerto Almendras, 3°48′S, 73°25′W, 122 m, 17 Jan. 1989, *Vasquez & Jaramillo 11537* (MO, USM); Arboleda de Peritos Forestales, near Pto. Almendra, 27 July 1972, *Croat 18552* (F); Mishana, halfway between Iquitos and Santa Maria de Nanay, Río Nanay, 130 m, 3°50′S, 73°30′W, 130 m, 22 July 1980, *Gentry et al. 28952* (MO); vic. Campamento Uno, 150 m, 3°50′S, 73°30′W, 150 m, 24 Feb. 1981, *Gentry et al. 31699* (MO); trail from UNAP (Zungarococha) to Niña Rumi, 130 m, 23 July 1984, *McDaniel & Rimachi 27819* (IMB, MO); Río Nanay, ca. 10 km above Puerto de Almendras, trail to Caserio Niña Rumi, 12 May 1976, *Rimachi 2256* (IMB); Yavari, Petropolis, 3 km from Río Amazonas, 8 Sep. 1976, *Revilla 1291* (F, USM).

Philodendron campii Croat, **sp. nov.** Type: ECUADOR. Pastaza: Along rd. between Puyo and Baños, vic. Shell, less than 1 km N of village, disturbed virgin forest in marshy area with standing water, 1,096 m, 1°29′39″S, 78°03′52″W, 15 Aug. 2002, *Croat, Hannon & Schmidt 86625* (holotype, MO-5745870; isotypes, K, US). Figures 5–8.

Planta hemiepiphytica; internodia 2–3 cm longa, 1–1.4 cm diam.; cataphylla plerumque 2-costata, 20–25 cm longa; petiolus teres, 5.5–7.5 cm longus; blades oblongo-



Figs. 1–4. 1–3 *Philodendron aureimarginatum* Croat (*Balslev 84636*). —1 (top L). Herbarium specimen showing blade with cordate base and infructescence. —2 (top R). (*Revilla 1972*). Type specimen showing leaf blade with rounded base and inflorescence at anthesis. —3 (bottom L). (*Rimachi 2721*). Herbarium specimen showing stem with cat-

lanceolata, 30–50 cm longa, 7.5–17 cm lata, plerumque obtusa vel rotundata ad basim; nervis primariis lateralibus 16–23 plerumque; inflorescentia 2–5(9) in quoque axila; pedunculus 6–11.6 cm longus; spatha viridis vel cremea, 4.5–8.2 cm longa; spadix viridis vel cremeus, 5.9–10.4 cm longus, parte pistillata 1.5–3.72 cm longa, 6.2–9 mm diam.

Epiphytic or occasionally terrestrial at higher elevations; **internodes** 2–3 cm long, 1–1.4 cm diam., pale green, drying tan to brownish; sap clear; leaf scars moderately conspicuous, 2.1 cm high, 3.7 cm wide; roots relatively few per node, descending, drying brown, mostly to ca. 4 cm long, 1–1.5 mm diam.; **cataphylls** subcoriaceous, sharply 2-ribbed, 20–25 cm long, medium green, with hyaline margins, inequilateral at apex, drying brownish, ultimately becoming fibrous. LEAVES erect to spreading, more or less rosulate; **petioles** 5.5–7.5 cm long, 9–10 mm diam., somewhat C-shaped in cross-section, thickly swollen and moderately spongy, bluntly and shallowly to deeply sulcate, medium green, semi-glossy, sheathed inconspicuously or between ⅓ and ½ of its length; **blades** oblong-oblanceolate, 30–50 cm long, 7.5–17 cm wide at widest point, 4–6.7 times longer than wide, 5.4–9.25 times longer than the petioles, widest point at ½ to ⅔ of length, subcoriaceous, semi-glossy, weakly bicolorous, dark green above, slightly paler below, acuminate at apex, acute to attenuate at base; **midrib** flattened near base, convex toward apex above, thicker than broad below; **primary lateral veins** (9)16–23 per side, arising from the midrib at 60–80° (mostly about 70°), curving upward, somewhat quilted-sunken above, convex and darker than the surface below; interprimary veins conspicuous, darker than surface; minor veins clearly visible; cross-veins sometimes weakly visible. INFLORESCENCES 2–5(9) per axil; **peduncles** 6–11.6 cm long, slightly flattened, ca. 3 x 5 mm diam., 0.9–1.5 times as long as the petioles, weakly glossy, medium green; **spathe** medium green to cream outside, not at all constricted, 4.5–8.2 cm long, averaging about 6 cm, to 2 cm diam. when furled, 3.4–3.7 cm wide when open, weakly cuspidate-acuminate at apex, the blade turning paler toward the margins, finally almost white along the margins; resin canals prominent, extending to within 1.7 cm of apex and 1 cm above the base; **spadix** white, 5.9–10.4 cm long; pistillate portion cylindroid, slightly narrowed toward the apex, 1.5–3.72 cm long, 5–8 mm diam. near apex, 6.2–9 mm midway, 6–8.5 mm at base; staminate portion weakly tapered, 2.3–7.5 cm long, 7.4–9 mm diam. at base, 5.4–7.5 mm diam. midway, 4–5.8 mm diam. near the apex; sterile staminate portion 8–10 mm long; **pistils** ± oblong, 1.6–2.2 mm long, 1.1–2 mm diam.; locules 6(7), ca. 1 mm long; **ovules** 1–2 per locule, contained within an oblong, transparent, gelatinous envelope, basal ovules 0.5 mm long, the funicle much shorter than the ovule; stigma depressed-globose, 0.4–0.7 mm diam., 0.4 mm thick. INFRUCTESCENCE with **berries** green to brown.

Philodendron campii ranges from Brazil (Amazonas) to southern Colombia (Amazonas, Vaupes, Putumayo, Nariño), through Ecuador (Napo, Pastaza, Sucumbíos, Morona–Santiago) and into northern Peru (Amazonas, Huanuco, Loreto, San Martín), and occurs in *Tropical moist forest* (bh-T), *Tropical wet forest* (bmh-T) and *Tropical pluvial forest* (bp-T) life zones, at 130–1,180 m elevation. Most collections have been made in Ecuador, in Sucumbíos, Napo and Pastaza Provinces or in Loreto Department of Peru. The collection from Vaupes Department of Colombia represents an outlying population, though it is possibly more common in the interven-

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aphylls, petiole and an inflorescence. —4 (bottom R). *Philodendron moonenii* Croat (*Cremers 14490*). Type specimen.

Figs. 5–8. *Philodendron campii* Croat —5, —6 (top L, top R). (*Croat 58869*). —5 Potted flowering plant showing typical blade shape with an acute base. —6 Inflorescence at

ing area than the collections indicate. Collections from Morona-Santiago, in Ecuador, and San Martín and Huanuco Departments in Peru, were less common.

Philodendron campii is distinguished by its usually epiphytic, rosulate habit, short, moderately slender stem and mostly oblanceolate to somewhat oblong-elliptic leaf blades with (9)16–23 pairs of primary lateral veins, usually 8–10(15) mm apart and arising at ca. 70° from the midrib. In addition, it has 2–5(9) inflorescences per axil, with ovate to nearly globular, greenish spathe tubes that are maroon within, and greenish white blades. It is a member of subgenus *Philodendron,* section *Calostigma,* subsection *Glossophyllum,* and has 5–6-locular ovaries and a solitary, basal ovule in each locule.

Philodendron campii is most easily confused with another new species described here, *P. paucinervium* Croat. The latter species has similar features, such as dark-drying blades and clusters of inflorescences of similar size and shape, but differs in having more oblanceolate blades that are usually attenuated toward the base, below the middle of the blade, and have 4–7 pairs of primary lateral veins that depart the midrib at a very acute angle, then spread at a 40–60° angle. In contrast, *P. campii* has blades that are more uniformly oblong-elliptic, with scarcely if any attenuation in the lower half of the blade, and usually have 16–23 pairs of primary lateral veins that typically depart the midrib promptly, at a 60–80° (mostly 70°) angle.

Although the drying color of most aroids tends to be consistent, unless moderately low temperatures are used, which causes them to dry less darkened, the drying color of both *P. campii* and *P. paucinervium* are somewhat inconsistent. While most collections of *P. campii* dry rather blackened, some specimens dry yellow-brown (See *Holm-Nielsen et al. 22180, 22229, 22480* and *22604* all from Curaray, in Pastaza Province). The same is true of *P. paucinervium,* with most collections drying somewhat blackened but with other specimens drying yellowish gray on the upper surface and yellowish green below (See *Ule 6186, 6306*), others drying dark brown above and yellow-brown below (See *Schultes & Idrobo 17420*) and still others drying yellow-brown on both surfaces (See *Killip & Smith 28149*).

Herbarium material of *P. campii* might be confused with *P. acutifolium* K. Kr., which has similar, oblanceolate blades. That species differs in having much larger, typically more yellow-green-drying blades, a larger inflorescence and a petiole that is usually deeply flat-sulcate.

Philodendron campii can also be confused with what may prove to be another species, since all of the material dried yellowish brown rather than blackened. These might, in fact, be the same species, but we are reluctant to include them here as paratypes. The material discussed above was collected in Peru, in the Bosque Nacional de Iparia in Huanuco Department, in *Tropical dry forest* (T-df) (*Schunke 2440*), in San Martín Department, along the road between Tarapoto and Yurimaguas, in *Tropical moist forest* (bh-T) (*Plowman 6003*; *Knaap & Mallet 8428*), and in Huambisa in Amazonas Department, in *Tropical moist forest* (bh-T) (*Huashikat 570*).

Kennedy 3874, from Jatun Satcha, is unusual in having blades that are more elliptic than most collections, but is probably this species.

The species was first collected by Eric Asplund in 1939. Since Asplund already has a species named in his honor, this species is named in honor of W. H. Camp, previously of the New York Botanical Gar-

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anthesis. —7 (bottom L). Cultivated potted plant, Bamboo Nurseries, Miami, showing blades with weakly subcordate base and more quilted veins. —8 (bottom R). (*Croat 61735*). Inflorescence at anthesis showing side view.

den, who made the second collection of the species in 1944.

Philodendron campii was treated in *Hortus Third* (Bailey & Bailey, 1976) and in *Exotica* 3 (Graf, 1963) as *Philodendron* "lynette'. It was considered a hybrid of *P. elaphoglossoides* Schott and *P. wendlandii* Schott (Bailey & Bailey, 1976), but the species is certainly not a hybrid. One of the purported parents, *P. wendlandii,* is restricted to Central America and *P. elaphoglossoides* is a rather rare species that does not occur within the natural range of *P. campii.*

Paratypes—BRAZIL. **Amazonas**: Río Javari, behind Paleiras Army Post, 5°8'S, 72°49'W, 1 Aug 1973, *Lleras P16997* (NY, US); 5°S, 72°49'W, 1 Aug 1973, *Heras et al. P16997* (INPA). COLOMBIA. **Amazonas**: Amacayacu, Parque Nacional Natural Amacayacu, Centro Administrativo INDERENA, a la orilla del Río Amacayacu, Bosque alto sobre maduro sobre suelos arcillosos, 3°47'S, 70°15'W, 100 m, 14 Apr. 1991, *Pipoly 15390* (MO); Río Apaporis, Raudal Yayacopi (La Playa) and vicinity, 0°5'S, 70°30'W, 244 m, 15 Mar. 1952, *Schultes & Cabrera 15989* (US). **Nariño**: La Planada, Tuquerres-Ricaurte, Reserva Natural La Planada, 7 km above Chucunés, trail to Pialapí, 150–200 m past entrance to La Planada Field Station, 1°06'N, 77°53'W, 244 m, 10 Mar. 1990, *Croat 78285* (MO). **Putumayo**: Buena Vista, 28 Sep. 1972, *Yaiguaje 41* (ECON); 13 Sep. 1972, *Piaguaje 8* (ECON). ECUADOR. **Morona-Santiago**: Centro Shuar Yukutais, 2°30'S, 78°8'W, 900 m, 12 Mar. 1990, *Bennett et al. 4076* (MO, QCNE); Limón (Gen. Plaza Guttiérrez) and Gualaceo, 1.2 km N of Limón, 2°58'36"S, 78°26'24"W, 1,211 m, 11 Aug 2002, *Croat et al. 86477* (MO); Macas-Riobamba (Guamote), 10.5 km W of Proaño, 2°16'09"S, 78°11'35"W, 956 m, 23 Aug 2002, *Croat & Hannon 86807* (MO); Gualaquiza Cantón, Gualaquiza-Nueva Targuí, Río Bomboiza, 3°26'S, 78°36'W, 1,300 m, 6 Mar. 1992, *Croat 72760* (MO); Limón-Indanza, Cordillera del Cóndor, Valley of Río Coangos, east of Shuar village of Tinkimints, 3°15'25"S, 78°12'50"W, 1,000 m, 25 Mar. 2001, *Neill & Manzanares 13219* (MO, QCNE); Morona Cantón, Macas-Puyo, 31 km N of Río Upano, 2°1'S, 77°56'W, 1,125 m, 7 Mar. 1992, *Croat 72798* (MO); Yurupaza, 600 m, 2 June 1947, *Harling 1040* (S); Río Upano, 1,750–2,500 m, 13 Nov. 1944, *Camp 979* (NY, S); Tena, 29 Aug. 1939, *Asplund 8899* (S). **Napo**: Puerto Napo-Mishuallí (16.5 km E on Río Misahuallí, at junction with Río Napo), 3.5 km E of Puerto Napo, ca. 1°02'S, 77°47'W, 2 May 1984, *Croat 58869* (MO); Limoncocha, 18 Mar. 1979, *Thompson 185* (MO); El Coca-Los Sochas, 0°25'S, 76°55'W, 250 m, 08 Oct 1987, *Cerón 2416* (MO, QCNE); Nuevo Rocafuerte, 0°56'S, 75°24'W, 200–230 m, 27 Feb. 1981, *Jaramillo 4415* (AAU, QCA); 0°30'S, 77°01'W, 250 m, 1 Oct 1987, *Cerón 2331* (MO, QCNE); vic. Limoncocha, 240 m, 16 June 1978, *Madison et.al. 5336* (K, QCA, SEL, US); Narupa-Coca, Huamani Centro Calluhua Yacu, 31 km E of Tena-Baeza rd, 0°40'S, 77°40'W, 1,150 m, 24 Dec. 1988, *Gentry et al. 64089* (MO); Luguna Jaton Co, 60 km SW of Nueva Rocafuerte, 1°00'S, 75°27'W, 200 m, 1 Sep. 1982, *Balslev 3053* (AAU); Archidona-Baeza, 6 km N of Archidona, 0°51'12"S, 77°47'20"W, 745 m, 19 Apr. 2003, *Croat et al. 87766* (MO); road to Mushullacta, 1–5 km S of Main Narupa-Coca Road, vic. Parque Nacional Napo-Galleras, 0°42'S, 77°36'W, 1,500 m, 20 Apr. 2003, *Croat et al. 87863* (MO); Río Yasuní, Garza Cocha, 1°05'S, 75°47'W, 200 m, 12 Apr. 1983, *Lawesson 43510* (AAU); Cañon de los Monos, 15 km N of Coca, Río Coca, 0°20'S, 77°1'W, 250 m, 9 Apr. 1985, *Palacios 300* (CM, MO, QCNE); 15 km N of Coca, Río Coca, Hacienda Noboa, 0°20'S, 77°1'W, 250 m, 5 Apr. 1985, *Neill 6349* (MO, QCNE); Estación Biológica Jatun Sacha, along S bank of Río Napo, 8 km E of Puerto Misahuallí, 1°04'S, 77°36'W, 450 m, 2 Apr. 1992, *Croat 73449* (MO, QCNE); 1 Apr. 1992, *Croat 73382* (MO); 1°04'S, 77°36'W, 400 m, 6 May 1990, *Palacios, Alvarez & Freire 4921* (MO); 1°04'S, 77°37'W, 450 m, 3 July 1986, *Miller et al. 2341* (MO, QCNE); 19–28 Mar. 1987, *Cerón M. 970* (MO, QCNE); 23–27 June 1987, *Cerón M. 1749* (AAU, MO,

QCNE); 4 Sep. 1987, *Cerón et al. 2096* (MO, QCNE); 10 Mar. 1995, *Schwerdtfeger 31054* (MO); Río Bueno, Path Cotapino (Concepcion), 400 m, 21 Feb. 1968, *Harling 7142* (GB); Río Cuyabeno, Puerto Montofar-Río Aguas Negra, 0°8′S, 75°58′W, 220 m, 18 Feb. 1980, *Holm-Nielsen 21323* (AAU); 0°15′S, 75°55′W, 210 m, 20 Feb. 1980, *Holm-Nielsen 21624* (AAU); Río Napo, Añangu, on S bank, 95 km downstream from Coca, 0°32′S, 76°23′W, 300 m, 11–28 Apr. 1986, *Balslev et al. 62266* (AAU); Río Napo, S of Itaya, 0°28′S, 76°33′W, 200 m, *Balslev & Dea 2840* (QCA); San Pueblo, 35 mi E of Lago Agrio, 1 Feb. 1984, *Hodgson 156* (K); Sumaco, Hollín-Loreto, km 25, Centro Challuayacu, trail to Guagua Sumaco, 0°43′S, 77°40′W, 1,230 m, 10–19 Nov. 1988, *Hurtado & Alvarado 1021* (MO, QCNE); Cantón Aguarico, Yasuní, Parque Nacional Yasuní, Lagunas de Garza Cocha, Río Garza, 1°01′S, 75°47′W, 200 m, 22 Sep. 1988, *Cerón & Gallo 5015* (MO); Nuevo Rocafuerte, Río Napo, 5 km E of Río Yasuní toward Laguna Jatuncocha, *Alarcon 29* (QCA); Añangu, 0°30′S, 76°25′W, 13 July 1982, *Luteyn 8669* (MO); 0°31′S, 76°23′W, 260–350 m, 30 May–21 June 1982, *Øllgaard et al. 38986* (AAU); 12 km from mouth of Río Napo, 0°57′S, 75°25′W, 200 m, 25–26 Aug. 1982, *Balslev & Alarcon 2920* (AAU, QCA); Parque Nacional Yasuní, 0°55′S, 76°11′W, 200 m, 26 May–8 June 1988, *Cerón & Hurtado 4033* (MO, QCNE); Río Yasuní and Lagunas de Jatun-Cocha, 0°58′S, 75°41′W, 200 m, 29 Sep. 1988, *Cerón & Gallo 5139* (MO); Río Añangu (black water), near jct. with Río Napo, 0°31′S, 76°23′W, 270 m, 18–28 Feb. 1983, *Luteyn 8996* (MO); E of Estación Cientifica Yasuní, near Sendero Peru, 0°40′S, 76°22′W, 210 m, 7 May 1999, *Leimbeck 213* (AAU, QCA); Cantón Archidona, Reserva Ecológica Antisana, Comunidad Shamato, 0°44′S, 77°48′W, 1,700 m, 27 Apr. 1998, *Clark et al. 5236* (MO, QCNE); Sumaco, Bosque Protector de la Comunidad de Mushullacta, 0°49′39″S, 77°33′47″W, 1,200 m, 25 Feb. 2003, *Altamirano 176* (MO, QCNE), *186* (MO, QCNE), *192* (MO, QCNE) & *194* (MO, QCNE); Volcán Sumaco, Carretera Hollín-Loreto, Cantón Archidona, S slopes of Volcán Sumaco, Hollín-Loreto, km 31, Comuna Challua Yacu, 0°43′S, 77°40′W, 1,200 m, 20–25 Mar. 1989, *Palacios 4113* (MO, QCNE); Cantón Orellana, Yuca-Taracoa de la Esperanza, beyond Taracoa, 22.5 km E of junction with main Coca-Río Tiguino road S of Coca, 0°34′S, 76°42′W, 350 m, 29 Feb. 1992, *Croat 72556* (MO, QCNE). **Pastaza**: Puyo-Diez de Agosto and Arajuno, 8.2 km NE of Diez de Agosto, 1°27′S, 77°51′W, 970 m, 4 May 1984, *Croat 59013* (MO); Centro Oriente, Tiwaeno, poblacion Waorani (Aucas), 400–500 m, 9 Aug. 1980, *Jaramillo 3265* (AAU); vic. Shell, ca. 1 km north of town, along Río Claro, 0°29′39″S, 78°03′52″W, 1,085 m, 27 Aug. 2002, *Croat & Hannon 87081* (MO); Shell, along Río Pindo, ca. 1.5 km N of Shell, 0°29′39″S, 78°03′52″W, 1,085 m, 5 May 2003, *Croat et al. 88575* (MO); Mera-Río Anzu, 7.7 km N of Río Alpayacu, 1°25′51″S, 78°04′34″W, 1,267 m, 8 May 2003, *Croat et al. 88857* (MO); Puyo, 930 m, 16 June 1978, *Kennedy 3874* (SEL); Río Papayacu at Río Curaray, 1°29′S, 76°42′W, 235 m, 23 Mar. 1980, *Holm–Nielsen 22602* (AAU); Curaray, near military post, 200 m, 19 Mar. 1980, *Harling 17520 & 17521* (MO); Valle de la Muerte, 1°25′S, 76°52′W, 240 m, 22 Mar. 1980, *Holm-Nielsen 22480 & 22408* (AAU); SE of airstrip, 1°22′S, 76°57′W, 250 m, 20 Mar. 1980, *Holm-Nielsen 22180 & 22229* (AAU); Montalvo, 0–1 km N and E of the military camp, 2°05′S, 76°58′W, 250 m, 17–19 May 1979, *Løjtnant & Molau 13446* (GB); Namoacu at Río Curaray, 1°27′S, 76°47′W, 230 m, 21 Mar. 1980, *Holm-Nielsen et al. 22305* (AAU); Río Namoyacu, ca. 21 km E of Curaray, 200 m, 21 Mar. 1980, *Harling 17587* (GB); Río Papayacu at Río Curaray, 1°29′S, 76°42′W, 235 m, 23 Mar. 1980, *Holm-Nielsen 22604 & 22601* (AAU); Río Villano, ca. 5 km above confluence with Río Curaray, 200 m, 24 Mar. 1980, *Harling 17721* (GB); Mera, 1,100 m, 25 May–6 June 1968, *Harling 9827* (GB) & *9747* (GB); Mera, 1,160 m, 27 Dec. 1958, *Harling 3733* (S); 1,100 m, 25 May–6 June 1968, *Harling 9971* (MO); Pozo petrolero "Ramirez", 20 km S of Curaray, 1°32′S, 76°51′W, 300 m, 21–28 Feb. 1990,

Zak & Espinoza 5133 (MO, QCNE). **Sucumbíos**: along road between Lago Agrio and Puerto El Carmen de Putumayo (at Río Putomayo on Colombian frontier), 91.7 km SE of Lago Agrio, 63.1 km SE of Dureno, 15.3 km E of Tarapoa, 00°08'N, 076°23'W, 260 m, 27 Apr. 1984, *Croat 58575* (MO); Cantón Lago Agrio, Parroquia Dureno, Comunidad indígena Cofán–Dureno, 0°02'S, 76°42'W, 350 m, 29–31 Dec. 1987, *Cerón M. & Cerón 3073* (MO, QCNE); Baeza–Lago Agrio, 760 m, 19 Dec. 1979, *Croat 49511* (MO); Lago Agrio–Río San Miguel, 17.3 km N of Lago Agrio, 0°07'S, 76°50'W, 450 m, 3 Oct. 1980, *Croat 50343* (MO,QCA); Estación Experimental de INIAP, San Carlos, 6 km SE of Los Sachas, 250 m, 9 Apr. 1985, *Baker & Trushell* 5949 (MO, NY, QCNE, SEL); Cantón Gonzalo Pizarro, Río Tigre, afluente del Río Dashiño, Lumbaquí–Reventador, km 73, 10 km S, 0°05'S, 77°24'W, 900–1,100 m, 19–21 Feb. 1987, *Neill & Palacios 7648* (MO); Cuyabeno Reserve, vic. 0°00'S, 76°10'W, 265 m, 11 Mar. 1990, *Balslev 97146* (AAU, MO); Laguna Grande, 0°00'S, 76°10'W, 265 m, 11 Mar. 1990, *Balslev 97220* (AAU); Reserva Cuyabeno, N of Laguna Grande, 0°01'N, 76°11'W, 265 m, 26 Mar. 1989, *Balslev et al. 84651* (AAU, QCA); N of Laguna Grande, 0°0'S, 76°12'W, 265 m, 11 Apr.–10 July 1988, *Nielsen 76333* (AAU); 0°00'N, 76°12'W, 265 m, 10 July 1988, *Nielsen 76052* (AAU); N of Laguna Grande, 0°01'N, 76°11'W, 265 m, 16 Mar. 1989, *Balslev et al. 84423* (AAU, QCA); Río Aguarico, 1 Aug. 1974, *Plowman et al. 4077* (GH); Cuyabeno, 0°17'S, 75°53'W, 200 m, 20 Feb. 1980, *Holm-Nielsen 21563* (AAU); Río Aguario, E of mouth of Río Cuyabeno, 0°16'S, 75°54'W, 200 m, 20 Feb. 1980, *Holm-Nielsen 21500* (AAU); Río Wai Si Aya, a northern tributary to Río Aguarico, 6 km upriver from San Pablo, 0°15'S, 76°21'W, 300 m, 10 Aug. 1980, *Brandbyge 32717* (AAU); Gonzalo Pizarro, Bosque Protector Los Cedros, Cuena del Río Tigre, 0°05'S, 77°25'W, 17 Mar. 1992, *Tipaz et al. 726* (MO, QCNE); Orellana, Loreto, Cotapino, S of Río Pucuno, near junction with Río Cotapino, 0°47'S, 77°26'W, 450 m, 4 Feb. 2000, *Neill et al. 12401* (MO, QCNE). PERU. **Amazonas**: Valle del Río Santiago, 3°50'S, 77°40'W, 9 Feb. 1980, *Tunqui 795* (MO); Condorcanqui, Distrito El Cenepa, Comunidad Aguaruna Pagki-Suwa, Río Cenepa, Quebrada Tayo, 4°31'35"S, 78°10'34"W, 289 m, 22 Jan. 1997, *Vásquez et al. 22143* (MO); Distrito El Cenepa, Comunidad de Mamayaque, Río Cenepa, Quebrada Sáasa, 4°37'08"S, 78°13'46"W, 400 m, 6 Feb. 1997, *Vasquez et al. 22425* (MO); Río Santiago, Caterpiza, Río Santiago, 200 m, 12 Sep. 1979, *Huashikat 570* (MO). **Huanuco**: Pachitea, 130 m, 29 Feb. 1968, *Schunke 2440* (COL, NY). **Loreto**: Explorama Lodge, Yanamono, 3°28'S, 72°50'W, 130 m, 11 June 1992, *Gentry et al. 77482* (MO); Yuvineto, Bellavista, *Barrier 791179S* (K, MO); Yuvineto, Bellavista, 22 July 1997, *Barrier 501* (NCY); Yuvineto, Bellavista, *Barrier 791179* (K); Río Yuvineto, tributary of Río Putomayo, near Ecuador border, Bellavista, vic. Santa Rita forest embankment, 11 Jan. 1993, *Croat 74098* (MO); Alto Amazonas, Andoas, 2°55'S, 76°25'W, 180 m, 9 Sep. 1983, *Vásquez 4434* (CM, MO); Andoas, 2°55'S, 76°25'W, 180 m, 2 Nov. 1983, *Vásquez & Jaramillo 4530* (MO, USM). **Loreto**: Río Tigre, 2°20'S, 75°53'W, 255 m, 18 Mar. 1987, *Lewis et al. 12895* (MO, USM); Vista Alegre, Río Tigre, 2°40'S, 75°35'W, 240 m, 17 Mar. 1987, *Lewis et al. 2856* (MO, USM); Maynas, Distrito Yanamono, Quebrada Yanamono, "Explorama" Yanamono camp, 3°24'S, 72°49'W, 150–180 m, 25 July 1986, *Croat 61735* (MO); Yanomono, 3°28'S, 72°48'W, 130 m, 18 Feb. 1981, *Gentry et al. 31424* (MO, USM), *31413* (MO, USM); Indiana-Río Napo, 200 m, *Gentry et al. 22189* (USM); Cantón Allpahuayo, Dtto. Iquitos, Allpahuayo, Estación Experimental del Instituto de Investigaciones de la Amazonía Peruana (IIAP), 4°10'S, 73°30'W, 150–180 m, 18 Jan. 1991, *Vasquez 15849* (MO); Distrito Indiana, Explorama Inn, 3°30'S, 72°58'W, 115 m, 30 June 1992, *Grández & Jaramillo 4196* (MO); Distrito Pebas, Caserio Colonia (Quebrada Sumón), tributary of Río "Yahuasyacu", Sumón, Caserio Colomia, 3°20'S, 71°5'W, 120–130 m, 31 Mar. 1991,

Grandez et al. 2389 (MO); 30 Mar. 1991, *Grandez et al. 2364* (MO); Indiana-Río Amazonas, Explorama Inn, 1 km S of Indiana, Río Amazonas, 3°30′S, 73°01′W, 130 m, 17 June 1986, *Gentry et al. 54644* (MO); Yanamono, 3°28′S, 72°50′W, 130 m, 28 June 1983, *Gentry & Vasquez 42293* (MO); 27–28 Dec. 1982, *Gentry & Emmons 38693* (MO, WU); Quebrada Sucusari, Explor Napo Camp, 140 m, 3°20′S, 72°55′W, 140 m, 11 Apr. 1991, *Vasquez & Jaramillo 15896* (MO); 5 Mar. 1991, *Pipoly et al. 14447* (MO); Río Ampiyacu, Distrito Pebas, 19 July 1976, *Revilla 831* (MO); vic. of Tierra Firme, above Estiron, 2°S, 72°20′W, 27 Apr. 1977, *Plowman 7102* (GH); Río Gueppi, tributary of Río Putumayo, trail from Puerto Peru, military post 8 km from mouth of river, toward Río Napo, 200 m, 15 May 1978, *Gentry et al. 21953* (MO); Río Yaguasyacu, Brillo Nuevo and vicinity, 2°40′S, 72°W, 15 Apr. 1977, *Plowman 6883* (GH, USM); Cantón Requena, Jenaro Herrera, Río Ucayali, Supay Forest Reserve, Jenaro Herrera, 4°55′S, 73°45′W, 20 Feb. 1987, *Gentry et al. 56227* (MO). **San Martín**: Mariscal Caceres, Apuzana, near San Martín-Huanuco border, 500 m, also as SEL 76–0075–002, 20 Apr. 1976, *Plowman 5938* (USM). Caserio El Progreso, off Tarapoto-Yurimaguas road, 6°25′S, 76°19′W, 700 m, 25 Sep. 1986, *Knapp and Mallet 8428* (MO, USM); Tarapoto-Yurimagnas rd, km 41, Vista Alegre, 28 Apr. 1976, *Plowman 6003* (USM).

Cultivated plants—ECUADOR. **Napo**: 15 km S of Coca, cultivated as *Besse et al. s.n.*, Selby 82–0432, 300 m, 16 Dec. 1991, *Ingram 1219* (MO); vic. Coca, *Feuerstein s.n.*, 300 m, Aug. 1991, *Croat 75406* (MO); Limon Cocha, cultivated as *Madison et al. s.n.*, Selby 78–1151, 9 Dec. 1991, *Ingram 1210* (MO). PERU. **San Martín**: Huallaga Basin, Aucayuca–Madremia, cultivated as *Plowman 5938*; Selby 76–0075–002, 23 Aug. 1991, *Ingram 1105* (MO); Locality unknown, cultivated at Missouri Botanical Garden, 14 Apr. 1986, *Sims 3* (MO).

Philodendron clarkei Croat, **sp. nov.** Type: ECUADOR. Esmeraldas: Along road to Río Tululbí from main San Lorenzo-Lita Hwy, 33 km E of Gasolinera San Lorenzo at edge of San Lorenzo, along Río San José, 1.1 km N of main Hwy, 59 m, 1°04′44″N, 78°38′59″W, 12 July 2000, *Croat et al. 83915* (holotype, MO–5150527, isotypes, AAU, B, CAS, COL, DUKE, F, GB, HUA, INB, K, MEXU, NY, PMA, QCA, RSA, S, SEL, TEX, UB, US, VEN). Figures 9–12.

Planta hemiepiphytica; internodia 4–12 cm longa, 1–2.7 cm diam.; cataphylla plerumque 2-costata; petiolus teres, 11–34 cm longus; lamina oblongo-lanceolata, 27–53 cm long, 12–22 cm lata, plerumque obtusa vel rotundata ad basim; nervis primariis lateralibus (7)8–13 plerumque; inflorescentia 6–7 in quoque axila; pedunculus 3–4(7.5) cm longus; spatha albida, 7.5–11(13) cm longa; spadix 7.5–9.5 cm longus; parte pistillata, 1.8–4.5 cm longa.

Hemiepiphyte; **internodes** to 4–12 cm long, 1–2.7 cm diam., gray to brown, densely transversely fissured; **cataphylls** 15–19 cm long, medium green, sharply 2-ribbed (rarely 1-ribbed), pale green-red, deciduous; **petioles** terete, 11–34 cm long, 3–7 mm wide at point of attachment, 5–11 mm wide at base, slightly thicker than broad, D-shaped, obtusely sulcate medially, with one side obtuse, the other more or less acute, dark green, weakly glossy, obtusely flattened adaxially, short-lineate; **blades** oblong-oblanceolate, 27–53 cm long, 12–22 cm wide, widest at 2/5 to ⅔ of length, subcoriaceous, dark green and semi-glossy above, moderately paler and almost matte below, acuminate at apex, inequilateral and acute to obtuse or rounded at base, sometimes somewhat cordulate, rarely subcordate; **midrib** flat (broadly convex) and slightly paler above, narrowly rounded and darker below, sometimes purplish; **primary lateral veins** (7)8–13 pairs, departing the midrib at a 50–60°, each vein 2.5–6 cm from the next, obtusely sunken, concolorous above, convex, slightly pleated and darker below; minor veins moderately obscure; INFLORESCENCES 6–7 per axil; **peduncle** 3–4(7.5) cm long, pale medium green,

Figs. 9–12. *Philodendron clarkei* Croat —9 (top L). (*Croat et al. 83065*). Leaf blade adaxial surface. —10 (top R). (*Croat 82132*). Leaf blade adaxial surface. —11 (bottom

densely striate; **spathe** 7.5–11(13) cm long, greenish white to creamy white, red-tinged near base on outer surface, whitish throughout within; **spadix** 7.5–9.5 cm long; **pistil** pale green, 1.8–4.5 cm long.

Philodendron clarkei is endemic to Ecuador and known only from the western slopes of the Andes in Carchi, Esmeraldas and Pichincha Provinces, in *Premontane wet forest* (P-wf). It is characterized by its deciduous, usually 2-ribbed cataphylls, D-shaped to V-shaped petioles, more or less oblong blackish-drying blades with widely spaced primary lateral veins and its clusters of whitish spathes.

Paratypes—ECUADOR. **Carchi**: N side of Río Mira, across from Lita, steep, N-facing slope directly across from (S of) community of Baboso, on S side of Río Baboso, 0°53′N, 78°27′W, 750 m, 11 Aug. 1994, *Boyle & Boyle 3529* (MO). **Esmeraldas**: Lita-San Lorenzo Rd, 3.7 km W of Río Lita Bridge (below Lita), on steep creek banks, 0°52′51″N, 78°28′30″W, 647 m, 30 June 1998, *Croat et al. 82132* (MO, QCNE); 5 km W of Río Lita Bridge (below Lita, on old road to San Lorenzo), along steep slopes of quebrada, 0°52′07″N, 78°27′43″W, 3 July 1998, *Croat et al. 82287* (MO); 14.2 km W of Río Lita Bridge (below Lita), 0°52′11″N, 78°27′16″W, 425 m, 4 July 1998, *Croat et al. 82338* (MO); 17 km W of bridge over Río Lita (on old road below Lita), 0°52′11″N, 78°27′06″W, 425 m, 6 July 1998, *Croat et al. 82385* (MO); 1.2 km W of El Durango, 21.1 km W of Alto Tambo, 0°52′11″N, 78°27′06″W, 300 m, 8 July 1998, *Croat et al. 82461* (MO), *Croat et al. 82467* (MO), *Croat et al. 82498A* (MO); 11 km W of El Durango, 9.7 km W of Alto Tambo, 1°02′31″N, 78°37′03″W, 380 m, 8 July 1998, *Croat et al. 82561A* (MO); 55.8 km W of Río Lita, 1°07′28″N, 78°43′18″W, 150 m, 6 Oct. 1999, *Croat et al. 83051* (MO), *Croat et al. 83065* (MO); 15.8 km W of Río Lita Bridge (new), 0°53′45″N, 78°31′57″W, 800 m, 9 Oct. 1999, *Croat et al. 83153* (MO), *Croat et al. 83178* (MO); 46.5 km E of Río Lita, 17.9 km W of Río Tululbí, 6.4 km W of El Durango, 1°04′41″N, 78°39′31″W, 70 m, 13 Oct. 1999, *Croat et al. 83254* (MO, USM); along Lita-San Lorenzo Rd, 36.6 km N of Gasolinera San Lorenzo, 12.6 km N of Río Tululbí, 1.7 km S of El Durango, 1°05′N, 78°38′W, 204 m, 18 July 2000, *Croat et al. 84142* (MO); 80.7 km N of Alto Tambo, 0°154′30″N, 78°132′37″W, 800 m, 20 July 2000, *Croat et al. 84224* (MO); Cayapas National Park, *Cornejo 478* (GUAY); Fila de Bilsa, 7 km E of San José de Bilsa, ca. 80 km due SW of Esmeraldas, 12 km SE of El Salto on Atacames-Muisne Rd, 0°37′N, 79°51′W, 280 m, 30 Jan. 1991, *Gentry et al. 72986* (MO); Muisne, Sitio San Salvador, Río Sucio, 100–150 m, Mar. 1995, *Palacios 13745* (AAU, MO, QCNE); Quinindé, Fundación Paraiso de Papagayos, Centro de Rescate de Aves & Mamiferos, 2 km via Esmeraldas, 0°20′N, 79°28′W, 200 m, 6 July 1997, *Clark 2773* (B, K, MO, QCNE, US); Bilsa Biological Station, Reserva Ecológica Mache-Chindul, 35 km W of Quinindé, 0°21′N, 79°44′W, 500 m, 20 Mar. 1998, *Clark & Pallis 4868* (MO, QCNE); 5 km W of Santa Isabel, 0°21′N, 79°44′W, 400–600 m, 12 Feb. 1996, *Clark 2149* (MO, QCNE). **Los Rios**: along Río Blanco, across river from Villa Hermosa, 0°05′S, 79°15′W, 250 m, 14 Oct. 1980, *Croat 50692* (MO); Cantón Quevedo, Cerro Centinela, Montañas de Ila, 10 km E of Patricia Pilar, 0°37′S, 79°18′W, 500 m, 19 June 1991, *Palacios & Freire 7419* (MO, QCNE); Patricia Pilar, 600 m, 6 Feb. 1979, *Dodson 7393* (MO, SEL). **Pichincha**: Cantón Quito, Parroquia Calacalí, 20 km Calacalí-Nanegalito Hwy, 0°02′N, 78°39′W, 2,000 m, 19 Jan. 1989, *Cerón et al. 5899* (MO); Sto Domingo de los Colorados, 0°16′S, 79°14′W, 600 m, 18

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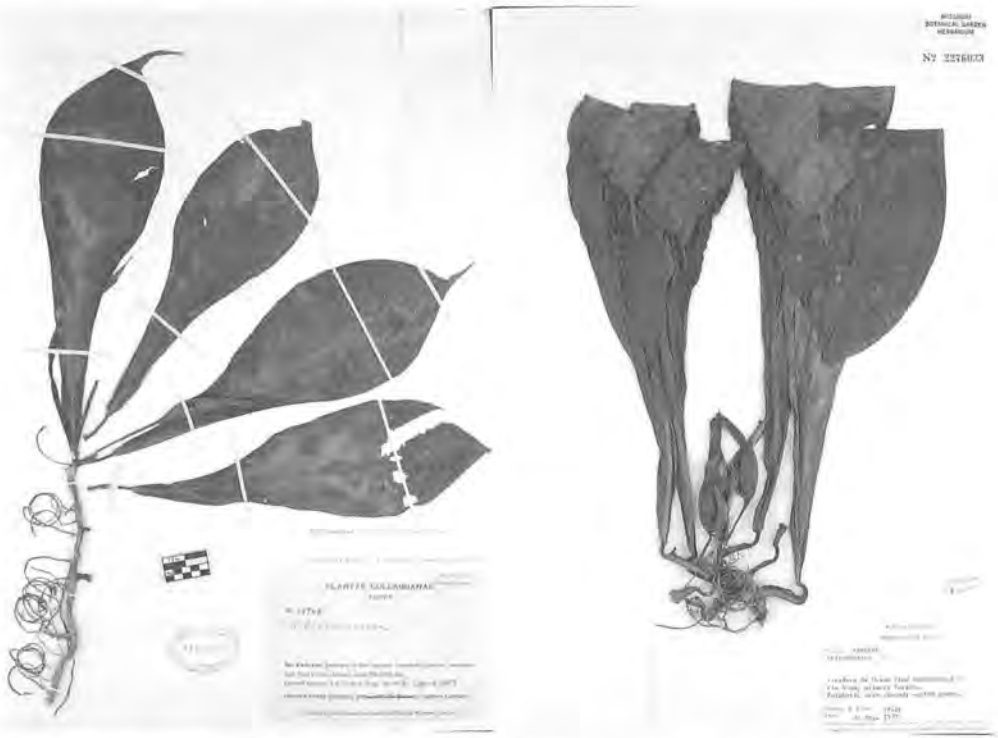
L). (*Croat et al. 83051*). Cluster of inflorescences showing closed inflorescences. —12 (bottom R). (*Croat 83254*). Stem with bases of petioles and cluster of inflorescences with one inflorescence at anthesis.

Feb. 1989, *Cerón & Benavides 6176* (MO); Hospedaje Mi Cuchita, just W of town, 0°14′S, 79°08′W, 600 m, May 1986, *Hammel & Trainer 15881* (MO); SW of Sto Domingo de Los Colorados, vic. Peripa, 0°09′34″S, 78°28′43″W, 250 m, 25 June 1998, *Croat & Nuñez 82098* (BR, MO, QCNE, SEL, UB); Bosque Proctectora "Las Perlas", along Río Cucharacha, vic. km 40 on Sto. Domingo-Esmeraldas Hwy, ca. 3 km S of Concordia, 0°00′09″S, 79°22′53″W, 300 m, 27 June 1998, *Croat et al. 82114* (CR, IC, MO, SCZ, WU); Las Perlas, 220 m, 0°00′49″–0°02′08″S, 79°22′21″–79°22′32″W, 26 May 1990, *Zak et al. 5297* (MO, QCNE); km 113, Nanegalito-Puerto Quito Rd, then N on road to Endesa Reserve, 0°04′52″N, 79°01′44″W, 602 m, 22 July 1998, *Croat 82833* (DUKE, MO, NY, QAP, US); 0°24′S, 78°48′W, 1,230 m, 17 Aug. 1983, *Thompson 1101* (CM, MO); 19.3 km E of Alluriquín, Machachi-Sto. Domingo rd, 0°24′S, 78°48′W, 1,230 m, 17 Aug. 1983, *Thompson 1101* (CM, MO); Cantón Quito, Mindo, 0°05′S, 78°45′W, 1,200 m, 16 Apr. 1994, *Neill & Asanza 10347* (MO, QCNE); km 6, Toachi-Las Pampas, off main rd, 1,300 m, 21 May 1983, *Dodson 13698* (MO, SEL); Cantón Sto. Domingo de Los Colorados, 25 km NW of Sto. Domingo, 1.9 km N of Hwy, Río Blanco, S of Valle Hermosa, 0°05′S, 79°15′W, 410 m, 13 Mar. 1992, *Croat 72969* (MO, QCNE); Hostería Valle Hermoso, 11 May 1995, *Vargas 499* (MO, QCNE); on Río Blanco, 0°05′S, 79°16′W, 350 m, 20 May 1995, *Stahl 1383* (MO); Río Toachi-Chiriboga, 0.1 km from Aloag-Sto. Domingo Rd, 0°18′S, 78°55′W, 1,200 m, 12 Mar. 1992, *Croat 72953* (MO); vic. Sto. Domingo de los Colorados, 0°16′S, 79°09′W, 400 m, 10 Apr. 1992, *Croat 73843* (BM, MO, QCA, QCNE, S, SEL); Comunidad Tsachila Otongo Mapali, 0°15′S, 79°20′W, 500 m, 8 Aug. 1995, *Ceron et al. 29232* (MO, QAP); 15 hectare patch of mature forest in Cooperative Santa Marta 2, along Río Verde, 2 km SE of Sto. Domingo de Los Colorados, 530 m, 5 Feb. 1979, *Dodson 7436* (MO); Reserva Endesa, along San Miguel de los Bancos-Puerto Quito Rd, NW of Quito, km 113, 28.6 km E of Puerto Quito, 3.1 km E of Vincente Maldonado, 3.4 km from main road, 0°03′N, 79°07′W, 710 m, 19 Mar. 1992, *Croat 73181* (GB, MO, P, USM); Reserva Endesa, 19 Mar. 1992, *Croat 73191* (EAP, HUA, MO, QCNE, W).

Philodendron moonenii Croat, **sp. nov.** Type: FRENCH GUIANA: Savane Roche du 14 Juillet–Bassin de l'Oyapock; 3°48′, 51°52′, collected 18 Dec. 1996 by J. Moonen (145). Specimen prepared 23 Dec. 1996. *Cremers 14490* (holotype, MO–05096781; isotypes, B, CAY, K, NY, P, US). Figure 4.

Planta hemiepiphytica; internodia 1–4 cm longa, 1.3–2.5 cm diam.; cataphylla 2-costata, 17 cm longa, decidua; petiolus 16.5–25 cm longus; lamina ovata vel anguste ovata, 20–29.5 cm longa, 13–17.5 cm lata; nervis primariis lateralibus 4–5 utroque; inflorescentia 3 in quoque axila; pedunculus 2.5–2.8 cm longus; spatha 5–7.5 cm longa, flavovirescens; spadix 5.7–7 cm longus; parte pistillata 3 cm longa, 6–7 mm diam.

Appressed-climbing liana; **internodes** 1–4 cm long, most longer than broad, 1.3–2.5 cm diam., (drying less than 1 cm diam.), dark green, turning grayish brown, drying dark yellow-brown, narrowly grooved longitudinally; **cataphylls** sharply 2-low-ribbed, 17 cm long, deciduous; **petioles** 16.5–25 cm long, matte, dark green (geniculum paler), drying dark brown, 5 mm diam.; **blades** ovate to narrowly ovate, 20–29.5 cm long, 13–17.5 cm wide, (1.3)1.6–1.8 times longer than wide, abruptly acuminate at apex, subcordate at base, bicolorous, dark green and semiglossy above, moderately paler and semiglossy below, drying yellowish gray-green and matte above, with minute, pale, linear cellular inclusions, slightly paler green below, drying yellow-brown and weakly glossy, with mostly short, sometimes weakly elongated, dark cellular inclusions; sinus arcuate, 1.5–2 cm deep; **midrib** sunken and purplish-spotted above, narrowly raised below; **primary lateral veins** 4–5 pairs, arising at 45–70°, purple-tinged, drying ± concolorous below; pos-



Figs. 13–14. *Philodendron paucinervium* Croat —13 (top L). (*Schultes & Cabrera 19968*). Herbarium specimen. —14 (top R). (*Croat 19426*). Type specimen.

terior lobes 4–6 cm long, broadly rounded; **basal veins** 2–3 pairs, 1st free to the base, 2nd & 3rd weakly fused ca. 1 cm; posterior rib not naked along the sinus. INFLORESCENCES 3 per axil; **peduncle** 2.5–2.8 cm long, 2–3 mm diam., drying reddish brown; **spathe** 5–7.5 cm long, yellow-green, drying 6–8 mm diam., 3 cm wide when flattened, drying light yellowish brown; **spadix** 5.7–7 cm long; **pistil** 3 cm long, 6–7 mm diam., slightly narrower at base and apex, yellowish; staminate portion 3–4 cm long, narrowly tapered to apex, whitish, becoming purplish post-anthesis.

Philodendron moonenii appears to be endemic to French Guiana and known only from the type locality. It is characterized by its narrowly ovate, subcordate blades that dry yellow-brown on the lower surface, and especially by its clusters of up to 3 small, greenish inflorescences. It is a member of section *Calostigma*, subsection *Macrobelium*, series *Macrobelium*. Its closest relative in the region is probably *P. sagittifolium* Liebm., but that species differs in having much larger leaves, always more than 30 cm long, and much larger inflorescences, typically more than 12 cm long.

The species is named in honor of its collector, Mr. Joep Moonen, a Dutch naturalist living in French Guiana, who first brought the material to the attention of the senior author.

Paratypes—FRENCH GUIANA: Crique Gaba, 26 June 2001, *Grenand 3277* (CAY, MO).

Philodendron paucinervium Croat, **sp. nov.** Type: PERU. Loreto: Distrito Amazonas: Distrito Mazán, Río Amazonas, 3 km below Varadero de Mazán, 130 m, 21 Aug. 1972, *Croat 19426* (holotype, MO–2276033, isotypes, F, IBE, MO). Figures 13, 14.

Planta hemiepiphytica; internodia ca. 1.5 cm longa, 6–12 mm diam.; cataphylla plerumque 2-costata; petiolus teres, 2–7.5 cm longus; blades oblongo-lanceolata, 22–46 cm lata, 6.7–12.7 cm lata, acutus vel obtusus vel anguste rotundatus ad basim; nervis primariis lateralibus 4–7 plerumque; inflorescentia 1–4 in quoque axila; pedunculus 2–4(5) cm longus; spatha viridis, 4.5–7.5 cm longa; spadix 4–7 cm longus.

Hemiepiphytic climber, usually on the lower portion of tree trunks in full shade; sap clear, copious, drying reddish; **internodes** mostly short, from less than 1 cm long to 1.5 cm long, 6–12 mm diam., drying with smooth, semi-glossy, tan epidermis, the epidermis sometimes cracking and breaking free; **cataphylls** unribbed, medium green, short dark green-lineate, 6.5–14 cm long, promptly deciduous; LEAVES with **petioles** 2–7.5 cm long, sheathed from 50% of to almost the entire length, the sheath inequilateral at apex, one or both sides free-ending; **blades** oblanceolate-elliptic, 22–46 cm long, 6.7–12.7 cm wide, abruptly to gradually long-acuminate at apex, frequently attenuated toward the base below the middle of the blade, narrowly acute to obtuse to narrowly rounded at base and also sometimes weakly attenuated near the base; upper surface dark green, semi-glossy to almost matte, drying usually grayish black above, sometimes grayish yellow; lower surface moderately paler and semi-glossy below, drying grayish black to grayish yellow-green to yellow-green below; **midrib** thickly convex, moderately to weakly paler than the surface on drying above, convex and darker than surface below on drying; **primary lateral veins** 4–7 pairs, departing midrib at very acute angle, then spreading at 40–60°, drying darker than surface on darker leaves, sometimes paler than surface on paler-drying leaves; minor veins moderately obscure on drying except on paler-drying blades. INFLORESCENCES 1–4 per axil; **peduncles** 2–4(5) cm long, 1–1.5 mm diam.; **spathe** 4.5–7.5 cm long, 5–10 mm diam., green, drying dark brown to blackened, scarcely constricted above the tube (constriction ca. ¾ of the length of the entire spathe); **spadix** 4–7 cm long, white, drying 3.2–3.4 mm diam. midway, 3–3.2 cm diam. at apex and base; staminate portion 3–4.2 cm long., 3.2–3.4 mm diam. midway, 3–3.2 mm diam. at base; sterile staminate portion 7.5–8.5 mm long, 3–3.2 mm diam. INFRUCTESCENCE with peduncles 6.5–8 cm long; fruiting portion of spadix drying 5.3 cm long, 1.2 cm diam.; **berries** whitish.

Philodendron paucinervium ranges from southern Colombia (Putomayo) to Ecuador (Napo, Pastaza), Peru (Loreto) and western Brazil (Amazonas), occurring in *Tropical moist forest* (bh-T), at 115–200 (800) m elevation.

Engler mistakenly determined collections of this species as *P. elaphoglossoides* Schott, but that species differs in having elongated, conspicuously warty internodes.

Paratypes—BRAZIL. **Amazonas**: Río Javari, behind Estirão de Ecuador, 10 Aug. 1973, *Lleras et al. P17298* (US). COLOMBIA. **Putumayo**: Mocoa, along Río Mocoa, 4 km from Mocoa, 800 m, 14 Nov. 1968, *Plowman 2023* (GH); Vaupes, Río Kuduyarí, 1°20′N, 70°30′W, 274–304 m, Apr. 1953, *Schultes 19968* (US); Río Pirapará (tributary of Río Apaporis), headwaters of Caño Teemeeña, 0°15′S–0°25′S, 70°30′W, 10 Sep. 1952, *Schultes & Cabrera 17420* (US). ECUADOR. **Napo**: Yasuní National Park, scientific station at Taputini, 200 m, 11 Mar. 1996, *Kjaer-Pedersen 2026* (MO). PERU: **Amazonas**: Bagua Province, Distrito Imaza, Región de Marañon, Comunidad de Yamayakat, Quebrada Kus-Chapi, Río Marañon, 4°55′S, 78°19′W, 550 m, Feb. 1995, R. *Vasquez 19785* (MO). **Loreto**: Yurimaguas, Aug. 1902, *Ule 6306* (B); Lower Río Huallaga basin, Yurimaguas-Balsapuerta, 135–150 m, 26–31 Aug. 1929, *Killip & Smith 28149* (NY); Santa Rosa, below Yurimaguas, 1–5 Sep. 1929, *Killip & Smith 28771* (NY); Santa Rosa, 9 Nov. 1929, *Williams 4827* (F); Leticia, June 1902, *Ule 6186* (B); Río Gueppi, tributary of Río Putumayo, on Ecuador border, trail from Puerto Peru to Río Napo, 8 km from

mouth of river, ca. 200 m, 15 May 1978, *Gentry et al. 21953* (MO); Maynas Province, Distrito Iquitos, Rd to Peña Negra, 5.5 km from Quista Cocha, 150 m, 19 Feb. 1986, *Rimachi 8147* (IBE); Río Nanay, Picuruyacu, 160 m, 11 June 1976, *McDaniel & Rimachi 20690* (IBE, MO); Tocha de Astoria to Río Mazan, near mouth of Río Mazan, 14 Aug. 1973, *McDaniel & Rimachi 17776* (IBE); Distrito Amazonas, Explorama Camp, near Sucusari, Río Napo, 3°20′S, 72°55′W, 100–140 m, 24 Feb. 1991, *Pipoly et al. 13594* (MO); Distrito Indiana, Yanomono, Explorama Inn, between Indiana and Río Napo, 1 km S of Indiana, 3°28′S, 72°48′W, 130 m, 18 Feb. 1981, *Gentry et al. 31424* (MO); 3°28′S, 72°58′W, 115 m, *C. Grández & N. Jaramillo 4196* (MO); between Indiana and Río Amazonas, 1 km S of Indiana, 3°30′S, 73°01′W, 130 m, 17 June 1986, *Gentry et al. 54644* (MO); Explorama Inn, 3°30′S, 73°03′W, 15 Feb. 1989, *Gentry et al. 65853* (MO); 3°28′S, 72°48′W, 120 m, 27 July 1980, *Gentry et al. 29138* (MO); Distrito Mazán, Río Amazonas, 3 km below Varadero de Mazán, 130 m, 9 Nov. 1979, *McDaniel & Rimachi 23252* (IBE); trail from Indiana on Río Amazonas and Río Napo, ca. 200 m, 24 May 1978, *Gentry et al. 22189* (MO); Río Ampiyacu, vic. village of Tierra Firme, above Estirón, ca. 2°00′S, 72°20′W, 27 Apr. 1977, *Plowman et al. 7102* (GH). **Madre de Dios**: Río Manú, Cocha Cashu Station, 350 m, 27 Nov. 1980, *Foster 5940* (MO).

Philodendron sparreorum Croat, **sp. nov.** Type: ECUADOR. Esmeraldas: 8.8 km NW of Quinindé, 85 km SE of Esmeraldas, 270 m, 0°26′N, 79°03′W, 31 Mar. 1983, *Croat 55555* (holotype, MO–3641840–42; isotypes, AAU, B, F, K, NY, QCA, QCNE, US). Figures 15–18.

Planta hemiepiphytica; internodia 2–6 cm longa, 2–6 cm diam.; petiolus (30)46–102 cm longus; lamina anguste ovato-cordata vel ovato-triangula, 40–67 cm longa, 25–57 cm lata; venas basalis 6–10 utroque, 1–2 libre ad basim; nervis primariis lateralibus 4–8 utroque; inflorescentia 2–7 in quoque axilla; pedunculus 8–21(25) cm longus; spatha 7.5–10 cm longa, versicolorous; pistillum viridulous, cum stylus prolongatus.

Appressed hemiepiphyte, climbing to 5 m high; stems usually 1.5–3 m long; roots elongated, to 5 mm diam., epidermis drying dark brown, smooth, semi-glossy, weakly folded, sometimes flaking; **internodes** 2–6 cm long, 2–6 cm diam.; epidermis drying smooth but folded and wrinkled, light brown to yellow-brown and closely longitudinally wrinkled; **cataphylls** unribbed, 25–28 cm long. LEAVES with **petioles** subterete, obtusely and weakly flattened adaxially (30)46–102 cm long, drying dark brown, to ca. 1 cm diam. midway, sheathed (8)14–23 cm when subtending an inflorescence; **blades** narrowly ovate-cordate to ovate-triangular, 40–67 cm long, 25–57 cm wide, subcoriaceous, weakly bicolorous, dark green and semi-glossy above, slightly paler and weakly purple-tinged below, drying light grayish green to grey or dark yellow-brown above, light yellowish green to yellow-brown below, abruptly acuminate at apex, prominently lobed at base, the lobes mostly broadly rounded, incurved toward sinus; sinus hippocrepiform to arcuate or closed; **midrib** ± flat above, drying weakly raised, medially sunken toward apex, convex and paler below, drying convex and paler; **primary lateral veins** 4–8 per side, usually alternating with interprimary veins (these only slightly less prominent than primary lateral veins), arising at a steep angle then spreading at 55–75°, weakly sunken above, drying weakly raised and slightly paler above, convex and paler below, drying convex, much paler and yellowish-brown; **basal veins** 6–10 per side, 1–2 free to the base, the 3rd pair coalesced with higher order veins 3.5–11 cm; posterior rib nearly straight, 11–17.5 cm long, naked 2.5–4 cm along the sinus; minor veins moderately visible; secretory ducts visible, intermittent; lower surface weakly granular at 30× magnification. INFLORESCENCES 2–7(12) per axil, producing a strong sweet scent of citrus; prophylls pink, 2-ribbed, one rib

Figs. 15–18. *Philodendron sparreorum* Croat —15 (top L). (*Croat 83357*). Habit of flowering plant showing abaxial surface. —16, —17, —18 (*Croat et al. 72311*). —16 (top R).

blunt, the other acute; **peduncles** pale green to pink, 8–21(25) cm long, drying 3–7 mm diam., gray-brown; peduncle & spathe flattened dorsiventrally; **spathe** 7.5–10 cm long, scarcely differentiated into tube and blade; outer surface at first pale green to yellowish, with salmon-colored flush, becoming deep salmon to red-orange, sometime greenish to yellow-green on tube and peach-colored to orange on blade, sometimes reported as yellow, orange or red throughout, drying reddish brown; inner surface whitish or cream, suffused with peach or cream-pink above middle; **spadix** ± cream-colored, 6–9.5 cm long; pistillate portion pale green, 2.5–3 cm long in front, 9–10.5 mm diam. midway, about as wide as the sterile male flowers; **pistils** pale green, with elongate protruding style 6–8 mm long, 0.4 mm diam., directed toward the apex, articulated and falling off just above the ovary with age; stigmas globular, ca. 1 mm long, 1.3–1.4 mm diam. at apex, slightly narrower on ovary, the apex almost circular to irregularly angular, often 5-sided, the margin thick and raised; locules 8–9; ovules 1 per locule, borne in a gelatinous envelope 0.7–0.8 mm long; **ovules** 0.35 mm long, funicle much shorter than ovule; staminate portion 4.2–6 cm long, barely or not at all constricted, with the sterile portion obscure, 6–9 mm diam., broadest in lower ⅓; sterile staminate portion short, inconspicuous, slightly narrower than fertile portions; staminate flowers 1.4–1.7 mm diam., 4–5-androus. **Berries** pale green to orange; seeds oblong-elliptic, brown on drying, 1.5–1.6 mm long, 0.6–0.7 mm diam.

Philodendron sparreorum ranges from Colombia to Ecuador, along the Pacific slopes in Colombia (Cauca, Chocó and Nariño Departments) and along the lower Pacific slopes of the Andes, at 30–1,100 m elevation, in Ecuador (Cotopaxi, El Oro, Esmeraldas, Guayas, Los Ríos and Pichincha Provinces). The species occurs in *Tropical wet forest* (bmh-T), *Premontane wet forest* (bmh-P) and *Premontane pluvial forest* (bp-P).

The species is recognized by its thick internodes, often longer than broad and drying with a smooth, light brown epidermis, as well as by its narrowly ovate-cordate blades with pale-drying major veins. More critical for recognition are the clusters of numerous, small, more or less pale orange inflorescences in one or more leaf axils, and especially the unusual pistils that have long, protruding, tapering styles.

Madison & Besse 7016 is described as having 12 inflorescences per axil, with the inflorescences smelling of cinnamon. *Camp 3701* also reports that there were up to 12 inflorescences "per cluster", but the number of inflorescences present in both collections is abnormal. *Pitman & Bass 823* describes the sap as white, a feature not reported in other collections.

One collection, *Tipaz et al. 2175,* reports the spadix as "rosado claro" and *Aulestia et al. 447* reports the spadix as "rosada". This is presumably an erroneous report that was presumably describing the spathe rather than the spadix.

This species was treated in the *Flora of the Río Palenque Science Center* (Dodson & Gentry, 1978) as *P. riparium* Engler. However, the latter species has only 2 inflorescences per axil and spathes that are much thicker, up to 2.5 cm in diameter. In addition, *P. riparium* has a typical discoid style (rather than a slender, tapered style) and a depressed-globose stigma.

Another new species from Nariño Department in Colombia (Junín–Barbacoas, *Croat 72437*), is very similar in leaf shape and coloration, and also has small inflo-

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Habit showing adaxial surface. —17 (bottom L). Stem showing long internodes and a cluster of 4 inflorescences in various stages. —18 (bottom R). Close-up of inflorescences with two closed spathes, one spathe at anthesis and an excised spadix with elongated pistils.

rescences but differs in having short, sessile styles, rather than the long protruding styles.

Paratypes—COLOMBIA. **Cauca**: Along rd between Popayán and Juntas via Viente de Julio Popayán, 17 km W of summit, 2°31′18″N, 77°01′56″W, 1,280 m, 19 July 1997, *Croat & Gaskin 80104* (JAUP, MO). **Chocó**: Hwy Bolivar-Quibdó, km 137.8, at cross, Río Atrato, 5°40′N, 76°20′W, 910 m, 11 Mar. 1984, *Juncosa 2438* (COL, MO); along road between Quibdó and Istmina, 6.6 km S of Quibdó, 5°33′N, 76°37′W, 100 m, 17 Dec. 1980, *Croat 52157* (MO). **Nariño**: Junín-Barbacoas, 1.9 km NE of Junín, 1°21′N, 78°06′W, 1,130 m, 27 Feb. 1992, *Croat 72425* (MO). ECUADOR. **Cotopaxi**: Quevedo-Latacunga, 44.7 km E of Quevedo, 12.4 km E of La Maná, 0°51′S, 79°12′W, 400 m, 5 Apr. 1983, *Croat 55861* (MO); Cantón Pulilí, Quevedo-Latacunga, 55.5 km from Quevedo, 23.5 km E of La Maná, 0°53′S, 79°04′W, 930–950 m, 10 Oct. 1983, *Croat 57050* (MO, QCNE); 1 km N of Pacayacu, 14 km N of Río Guasaganda, at Guasaganda, 22 km N of Palmar (village NE of La Maná on Quevedo-Latacunga Rd, 13 km NE of La Maná), 0°41′30″S, 79°6′30″W, 670 m, 11 Oct. 1983, *Croat 57079* (MO, WU). **El Oro**: Santa Rosa, 11 km W of Piñas on new rd to Sta. Rosa, 850 m, 8 Oct. 1979, *Dodson et al. 9018* (MO). **Esmeraldas**: Lita-San Lorenzo Rd., 10–20 km NW of Lita, 0°55′N, 78°35′W, 800 m, 12 May 1991, *Gentry et al. 70126* (MO); 15.5 km W of Lita, 0°55′N, 78°28′W, 705 m, 22 Feb. 1992, *Croat 72370* (MO); 0.9 km E of El Durango, 19.8 km W of Alto Tambo, 0°52′N, 78°27′06″W, 350 m, 8 July 1998, *Croat et al. 82514* (MO); La Tola, vic. Olmedo, 1°10′N, 79°03′W, 3 m, 22 May 1994, *Cornejo & Bonifaz 2648* (GUAY, MO); La Tola, 17 Dec. 1984, *Lescure 2243* (CAY); vic. Alto Tambo, 19.4 km W of Río Lita, 0°54′N, 78°32′41″W, 829 m, 5 Oct. 1999, *Croat et al. 82999* (MO); 44.3 km W of Río Lita, 3.2 km W of El Durango, 1°04′06″N, 78°38′49″W, 309 m, 6 Oct. 1999, *Croat et al. 83038* (CM, MO, QCA); 11.8 km E of Río Tululbí, 25 km E of Gasolinera San Lorenzo E of downtown San Lorenzo, 1°06′38″N, 78°42′31″W, 125 m, 7 Oct. 1999, *Croat et al. 83109* (MO); 15.8 km W of Río Lita Bridge (new), 0°53′45″N, 78°31′57″W, 800 m, 9 Oct. 1999, *Croat et al. 83161* (MO); 26.9 km W of Río Lita, 13.2 km E of El Durango, 0°58′06″N, 78°33′45″W, 735 m, 17 Oct. 1999, *Croat et al. 83385* (MO, USM); along rd to Río Tululbí, from main Lita-San Lorenzo Hwy, 33 km E of Gasolinera San Lorenzo, at edge of San Lorenzo, along Río San José, 1.1 km N of main Hwy, 1°04′44″N, 78°38′59″W, 59 m, 12 July 2000, *Croat et al. 83901* (MO); San Lorenzo-Mataje, 1.9 km E of Mataje, 16.4 km W of main Lita-San Lorenzo Hwy, 1°02′52″N, 78°43′01″W, 45 m, 14 July 2000, *Croat et al. 83986* (MO); 11.6 km N of Gasolinera San Lorenzo, 1.4 km W of main Lita-San Lorenzo Rd., 1°14′42″N, 78°45′26″W, 63 m, 15 July 2000, *Croat et al. 84038* (MO); La Tola, 1°11′S, 79°01′W, 5 m, 28 Feb. 2000, *Cornejo & Bonifaz 6943* (GUAY, MO); Río Santiago at Concepión, 1°03′00″N, 78°49′00″W, 30 m, 4 Sep. 1980, *Holm-Nielsen et al. 25962* (AAU); Awá Reserve, community of Mataje, 1°15′N, 78°40′W, 225 m, 31 Oct. 1994, *Ortiz & Montesdeoca 23* (MO, NY); vic. Lita, on the Ibarra-San Lorenzo RR, 550–650 m, 11 June 1978, *Madison et al. 5253* (SEL, US); Río Cayapa, Zapallo Grande, 0°48′N, 78°54′W, 100 m, 25 June 1982, *Kvist & Asanza 40310* (QCA); 200 m, 19–25 Oct. 1983, *Barfod et al. 48403* (AAU); *Kvist et al. 48403* (AAU); *Kvist 40849* (QCNE); Cooperativa Atahualpa, 1°00′N, 79°00′W, 200 m, 3 Sep. 1980, *Holm-Nielsen et al. 25858* (MO); Río San Miguel, 1 hour upstream from San Miguel de Cayapas, 0°43′N, 78°52′W, 220 m, 1 Sep. 1980, *Holm-Nielsen et al. 25449* (MO); Eloy Alfaro, Comuna de San Miguel, La Cooperativa, Río San Miguel, 0°44′N, 78°54′W, 110–160 m, 12 Sep. 1993, *Yañez et al. 2546* (MO, QCNE); 0°44′00″N, 78°54′00″W, 110–160 m, 12 Sep. 1993, *Yañez A. 1546* (QCNE). Esmeraldas-Borbon, 15.1 km N of Lagarto, 2.1 km N of turnoff to Borbon from Lagarto-La Tola Rd, 1°05′N, 79°11′W, 50 m, 17 Mar. 1992, *Croat 73095* (MO, Q, WU); Reserva Ecológica Cotacachi-Cayapas, Charco Vicente,

Río San Miguel, 0°43′N, 78°53′W, 150 m, 6–9 Sep. 1993, *Palacios & Tirado 11341* (MO, QCNE); "La Mayronga" ENDESA, 1°05′N, 79°10′W, 90 m, 26 Oct. 1993, *Jaramillo 15567* (QCA); Quinindé, 0°21′N, 79°44′W, 400–600 m, 16 Nov. 1994, *Bass & Pitman 260* (MO, NY, QCNE, US); Jct. of Río Blanco and Río Quinidé, 0°20′S, 79°28′W, 10 m, 27 July 2001, *Cornejo & Bonifaz 7207* (GUAY, MO); Mache-Chindul Ecological Reserve, Bilsa Biological Station, Mache Mountains, 35 km W of Quinindé, 5 km W of Santa Isabel, 0°21 N, 79°44′00″W, 400–600 m, 21 Nov. 1994, *Clark & Bergman 301* (MO); 12 Oct. 1994, *Pitman & Bass 823* (MO, QCNE); 500 m, 6 Jan. 1997, *Clark et al. 3753* (MO, QCNE); 20 Mar. 1998, *Clark & Pallis 4825* (MO, QCNE, US); Lita-San Lorenzo, 40.1 km W of Lita, 0°56′N, 78°40′W, 350 m, 21 Feb. 1992, *Croat 72311* (MO); Parroquia Ricaurte, Centro Pambilar, 1°08′N, 78°36′W, 500 m, 21 Jan. 1993, *Aulestia & Aulestia 932* (MO, QCNE); Parroquia Mataje, Reserva Etnica Awá, Centro Mataje, 1°08′N, 78°33′W, 200 m, 21 Sep. 1992, *Aulestia et al. 447* (MO, QCNE); 1°11′44″N, 78°34′29″W, 200 m, 17 Nov. 2000, *Ramírez et al. 16* (B, MO, QCNE, US); *Cuascota & Grupo de Post-Grado 249* (MO, QCNE); Reserva Etnica Awá, Centro Guadualito, 1°15′N, 78°40′W, 80 m, 20–29 July 1992, *Aulestia et al. 192* (MEXU, MO, QCNE); 17 Aug. 1967, *Sparre 18075* (S); km 369 on Quito-San Lorenzo RR, 12 July 1964, *Jativa 743* (S); La Florida-Río Mataje, 1°17′00″N, 78°50′00″W, 60 m, 18 Feb. 1993, *Jaramillo 15066* (QCA); new rd to "Proyecto NO", km 8–10, 19 Aug. 1967, *Sparre 18214* (S); Alto Tambo, Recinto Ventanas, 800 m SW of Río Carolina, 0°55′N, 78°38′W, 390 m, 23 Oct. 1999, *Valenzuela et al. 638* (MO, QCNE); Centro Ricaurte, 1°10′N, 78°32′W, 300 m, 25 Oct. 1992, *Tipaz et al. 2175* (MO, NY, QCNE); Reserva Etnica Awá, Parroquia Alto Tambo, Centro de la Unión, Cañón del Río Mira, 0°52′N, 78°26′W, 250 m, 22 Mar. 1993, *Aulestia & Aulestia 1399* (MO, QCNE). **Guayas:** Bucay, 304–381 m, 8–15 June 1945, *Camp E-3701A* (MO, NY); Cañar-Chimborazo-Bolívar, ca. Bucay, 305–381 m, 8–15 June 1945, *Camp E-3701* (AAU, S). **Los Ríos**: 7 km E of Patricia Pilar, 304 m, 28 July 1980, *Hansen 7844* (MO); Hacienda Monica, 12 km E of San Carlos, 180 m, 3 Nov. 1967, *Sparre 19372* (S); Hacienda Clementina, near Puerta Negra, 1°40′S, 79°21′W, 200 m, 9 Oct. 2003, *Stahl & Cornejo 6157* (GUAY); Patricia Pilar-24 de Mayo, La Centinela, 600 m, 27 Nov. 1978, *Dodson 7289* (MO, SEL); 0°36′00″S, 79°18′00″W, 300–400 m, 1 July 1977, *Iltis et al. E-94* (WIS); Centro Científico Río Palenque, 200 m, 1 Sep. 1976, *Croat 38705* (MO); 150–220 m, 20 July 1975, *Dodson 5876* (SEL); 12 Nov. 1979, *Schupp 47* (F, SEL); 0°30′00″S, 79°20′00″W, 150–220 m, 5–14 Mar. 1977, *Dodson 6659* (SEL). **Manabí**: Cerro Pata de Pajaro, 12 km E of Pedernales, above La Humedad, 0°01′N, 79°58′W, 380–450 m, 12 Nov. 1998, *Delinks & Robles 157* (QCNE). **Pichincha**: vic. Hotel Tinalandia, Río Toachi, 9.6 km E of Sto Domingo de los Colorados, 0°16′S, 79°07′W, 600 m, 2 Apr. 1983, *Croat 55682* (M, MO, QCA); km 147 on Quito-La Independencia Hwy (between Puerto Quito and Río Esmeraldas bridge), 0°07′N, 79°20′W, 200 m, 08 Apr. 1989, *Grayum & Zamora 9368* (MO); Sto. Domingo de Los Colorados, Hospedaje Mi Cuchita, just W of town, 0°14′S, 79°08′W, 600 m, May 1986, *Hammel & Trainer 15882* (MO); Peripa, SW of Sto. Domingo, 0°09′34″S, 78°28′43″W, 250 m, 25 June 1998, *Croat & Nuñez 82052* (MO, QCNE); km 113, Nanegalito-Pto. Quito Rd, Endesa Reserve, 0°04′52″N, 79°01′44″W, 602 m, 22 July 1998, *Croat 82835* (MO); 14 Oct. 1992, *Ingram 1617* (SEL); 0°05′N, 79°02′W, 800 m, 4 Mar. 1984, *Rodriguez 271* (QCA); 0°03′N, 79°07′W, 710 m, 19 Mar. 1992, *Croat 73182* (MO); Montañas de Ilah, La Centinela, 600 m, 21 Jan. 1992, *Ingram 1231* (SEL); hills N of Alluriquín, 950 m, 21 Apr. 1977, *Madison 4096* (QCA); Bosque Protector La Perla, Sto. Domingo-Quinindé, km 41, 0°0′49″–0°02′08″S, 79°22′21–79°22′32″W, 220 m, 11 Aug. 1990, *Zak et al. 5697* (QCNE); Quito-Sto. Domingo, SW of Chiriboga, km 89–90 from Quito, 0°20′00″S, 78°52′00″W, 1,100 m, 8 July 1979, *Lojtnant & Molau 15651* (AAU); Bosque Protector Las Perlas,

0°00′49″S, 79°22′21″W, 220 m, 3 June 1990, *Zak et al. 5479* (QCA); Toáchi, at confluence between Río Pilatón and Río Toáchi, 850 m, 9 Sep. 1967, *Sparre 18447* (S), *Sparre 18449* (S); Toáchi, 850 m, 3 Jan. 1967, *Sparre 13858* (S).

Cultivated plants—Montañas de Ila, La Centinela, *Dodson s.n.*, (SEL 76-0091-035) vouchered as *Ingram 1231*, 21 Jan. 1992 (SEL), 4 May 1992, *Ingram 1416* (SEL); 9 May 1991, *Croat 71801* (CM, MO); 4 May 1992, *Ingram 1416* (MO); Hills N of Alluriquín, 800–1000 m, *Madison 4096* (SEL 77-2098), vouchered as *Madison 6746* (SEL) and *Ingram 1205* (MO, SEL); 24 Feb. 1997, *Croat 79465* (CM, F, MO, SEL); 3 Dec. 1991, *Ingram 1205* (MO).

Philodendron werkhoveniae Croat, **sp. nov.** Type: SURINAM, Kappel Savanna, originally collected by *Determann & Perry s.n.*, Cultivated at Atlanta Botanical Garden (91-1484), *Croat 79413* (holotype, MO–05054485; isotypes, B, CAY, COL, K, NY, P, SEL, SURINAM, U, UB, US). Figures 19–22.

Planta terrestris; cataphylla persistens intacta; internodia brevia, 1.5 cm diam.; petiolus subteres, (24)40–55 cm longus; lamina 26–35 cm longa, profunde 3-lobata; nervis primariis lateralibus 2–4 utroque (lobus medius); inflorescentia solitarius; pedunculus (5)11–13 cm longus, 7 mm diam.; spatha 6–8 cm longa; tubo 4.0–4.5 cm longo, 1.8–2.2 cm diam., viridis vel pallide luteus; spadix 6.5 cm longus, parte pistillata 1.8–2.2 cm longa, 9–11 mm diam.

Terrestrial, on boulders or as a low epiphyte; often growing on talus in groups of 5–8 stems; **internodes** short, to 1.5 cm diam.; **cataphylls** persisting intact at upper nodes, with thin, brown epidermis. LEAVES with **petioles** subterete, slightly flattened adaxially, bluntly 1-angular on 1 side, (24)40–55 cm long, moderately firm, dark green, weakly glossy or matte; **blades** 26–35 cm long, deeply 3-lobed to within 1.5–2.5 cm of base, subcoriaceous, matte, moderately bicolorous, dark green above, the lobes arching, with tips turned downward, narrowly acuminate at apex (often merely acute on lateral lobes); medial lobe more or less elliptic, (22)26–35 cm long, (6.3)8.2–12.3 cm wide, narrowly confluent onto the lateral lobes; lateral lobes inequilateral, attenuate at base, falcate, curved toward the apex, (13)22–24 cm long, (2)4–9 cm wide; **midrib** sunken above, narrowly raised and darker below; **primary lateral veins** deeply sunken-quilted above, pleated-raised, darker and matte below, drying slightly paler than surface, 2–4 pairs on medial lobe, mostly aggregated in lower half of lobe, arising at 20–35°, 6–9 pairs on lateral lobes, joined into a posterior rib extending straight into the lateral lobe, with the veins pinnately arranged on both sides, several coalesced 4.5–6 cm; minor veins moderately distinct, dark and fine below, somewhat raised on drying; cross-veins distinct on drying. INFLORESCENCE solitary; **peduncle** (5)11–13 cm long, 7 mm diam., dark green, weakly glossy, coarsely pale, short green-lineate at apex and on base of tube; **spathe** 6–8 cm long; spathe tube 4–4.5 cm long, 1.8–2.2 cm diam., medium green to pale yellow, dark-green-striate outside, pale green inside; spathe blade greenish white on both surfaces; **spadix** cream-colored, stipitate 6 mm (stipe 6 mm diam., green), 6.5 cm long, slightly shorter than spathe; pistillate portion 1.8–2.2 cm long, 9–11 mm diam., pale tan; staminate portion 4 cm long, 8 mm diam., broadest at base, weakly tapered to apex; sterile staminate portion 1 cm long, 8.5–9 mm diam.; **pistils** pale green, pale yellow (post-anthesis), 1.8–2.2 cm diam., some of the uppermost much reduced and sur-

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Figs. 19–22. *Philodendron werkhoveniae* Croat —19, —20, —21 (*Selby 81-20-91*). —19 (top L). Potted plant showing habit. —20 (top R). Blade adaxial. —21 (bottom L). Stem showing creeping habit, with persistent intact cataphylls and petioles. —22 (bottom R). (*Croat 794513*). Adaxial blade surface with loose spathe and with the spadix removed.

rounded by staminodes; stigmas 1.3–1.4 mm wide; ovaries (4)6-locular; **ovules** 15–20 per locule, 0.2–0.5 mm long; funicles 0.3–0.5 mm long; **berries** orange.

Philodendron werkhoveniae occurs in Suriname and French Guiana. In French Guiana, it is known only from Haut Oyapock, Mt. St. Marcel, at 300–450 m elevation, along Crique Poivre. The species is terrestrial, with mature berries reported for 24 March *Sastre 4530* (CAY).

Paratypes—FRENCH GUIANA. Haut Oyapock, Mt. St. Marcel, along Crique Poivre, 300–400 m, 24 Mar. 1976, *Sastre 4330* (CAY). SURINAME. **Emmaketen**: Creek in line from Camp 15 to Main Camp, 300 m, 29 July 1959, *Daniëls & Jonker 781* (U); 2.5 km from Main Camp, 300 m, 5 Sep. 1965, *Jonker-Verhoef & Jonker 942*; District Saramacca, Rudi Kappel airstrip, E of Kappelsavanna, Roraima sandstone, 300 m, 8 July 1981, *Werkhoven UVS–16647* (SEL). **Sipaliwini**: Summit of Tafelberg, between Lisa Creek & Augustus Creek, ca. 50 m from W rim of tepui, 3°55′20″N, 56°11′50″W, 575 m, 1 July 1998, *Evans et al. 3015* (K, MO); Tafelberg, Sipaliwini, 3°54′30″N, 56°10′35″W, 700 m, 4 July 2001, *Evans 3287* (MO); 650–750 m, 8 July 2001, *Hawkins 1926* (F, MO), *2202* (MO).

Cultivated plants—Kappel Savanna, collected without voucher by Determann & Perry (SEL 81-2091), 14 Sep. 1993, *Ingram 1878* (MO, SEL); Mt. St. Marcel, 2°23′00″N, 53°00′20″W, 280 m, 27 July 2002, *De Granville et al. 15519.*

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