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Confusion about *Pitcairnia aphelandriflora* Lem. and a new well known related species

ERIC J. GOUDA[1] & JOSÉ MANZANARES[2]
[1]*University Utrecht Botanic Gardens, Budapestlaan 17, 3584 CD, Utrecht, Netherlands*
e.j.gouda@uu.nl; https://orcid.org/0000-0003-3578-8072
[2]*Herbario Nacional del Ecuador (QCNE) del Instituto Nacional de Biodiversidad, Avd. Río Coca E6-115 e Isla Fernandina, Quito, Ecuador*
jose_manzanares@icloud.com; https://orcid.org/0009-0005-3624-1513

Abstract

Pitcairnia aphelandriflora Lem. has a long history known from Panama, Ecuador and Peru, but is actually an unresolved species from an island near the coast of Santa Catarina, Brazil and the species that is generally considered *P. aphelandriflora* is actually an unnamed species, described, illustrated and compared with its morphologically closest species below.

Key words: Taxonomy, Brazil, Flora of Ecuador

Resumen

Pitcairnia aphelandriflora Lem. tiene una larga historia conocida en Panamá, Ecuador y Perú, pero en realidad es una especie no resuelta de una isla cerca de la costa de Santa Catharina, Brasil y la especie que generalmente se considera *P. aphelandriflora* es en realidad una especie nueva, descrita, ilustrada y comparada con su especie morfológicamente más cercana a continuación.

Palabrasclave: Taxonomía, Brazil, Flora of Ecuador

Introduction

Lemaire (1869: 90) introduced *Pitcairnia aphelandriflora* with a short description and without a plate. André (1870) transferred the species to *Pepinia,* included the famous icon (litho) in this publication (Fig.1) and is the type for that genus (no longer recognized). A few years later, André (1889) did not mention it in his Bromeliaceae Andreanae (1889). A direct comparison of Andre's icon and the short description by Lemaire confirms that they refer to the same taxonomic entity. However, this species definition does not fully match the taxonomic definitions of modern taxonomic treatments (Smith & Downs 1974, Rauh 1987, Gilmartin 1972, Manzanares 2005, etc.), which misidentified tens of specimens from northern South America and Central America as *P. aphelandriflora.*

The original material described by Lemaire was first published to come from the island Ste. Catherine without mentioning in which country this is situated. A search for another possibility than Santa Catarina, Brazil, especially for an island that is in the range of what generally is considered *Pitcairnia aphelandriflora*, has not been found. The plant was first published to be discovered by Marie Gautier, who sent material to the A. Verschaffelt establishment, where it was observed in flower and described by Lemaire in July 1869. Note that the type specimen of *Vriesea guttata* Linden & André (1875: 43) is also collected by M. Gautier in Santa Catarina, Brazil.

The icon published by André is also showing the name of Verschaffelt on the bottom (Fig. 1), indicating that it is from the original material and is showing remarkable differences to what now is considered *Pitcairnia aphelandriflora*. André also corrected the origin of the plant to be collected by Mr. Baraquin around 1867 from Para, Brazil (also mentioned on the icon, which was much larger at that time and included Amazonas), which makes the species Amazonian (not Atlantic), nevertheless, no material is known from that area that fits the plate and description.

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FIGURE 1. The famous icon (litho) in the publication of *Pepina aphelandriflora* André (1870)

Werner Rauh (1987) already observed some of the differences between material he obtained from Napo, Ecuador, and original description and or plate, and proposed a new variety (*longicaulis*) which was never published.

Beside the unplaced *Pitcairnia aphelandriflora* from Brazil, there are only a few species known with long and slender leafless stems and narrow short leaves, which are *P. punicea* Scheidweiler (1842: 25) that grows from Mexico to Guatemala and the new proposed species from Panama to Peru.

Pitcairnia aphelandriflora seems to be morphological more closely related to *P. punicea* than to the newly proposed species growing from Panama to Peru, described below which is compared here with *P. punicea,* because there is no herbarium material available of *P. aphelandriflora* and must be considered an unresolved species until it has been rediscovered. Only Mez (1896) seems to have studied material in herbarium Leod., Petrop., which is not verified here. The natural situation of the Amazonian *P. aphelandriflora* is not known to us, but I hope that the species will be rediscovered after 150 years.

Taxonomy

Pitcairnia aphelandriflora Lem. Ill. Hort. 16, Misc.: 90 (1869)

Lectotype (***designated here***): typified by Plate 5 in *Hortic.* 17: 32 (André 1870), see below.

=*Pepinia aphelandriflora* (Lem.) André *Illustr. Hortic.* 17: 32 pl. 5 (1870).

=*Hepetis aphelandriflora* (Lem.) Mez DC. Monogr. Phan.. In: De Candolle, C. (ed.). Monographiae Phanerogamarum 9: 367 (1896).

Figure 1 shows the famous icon (litho) in the publication of *Pepina aphelandriflora* André (1870) collected in Para, Brazil and obvious are the relatively narrow green floral bracts that are exposing part of the sepals and are not imbricate at all. Another characteristic also mentioned by Rauh are the straight convergent petal apices with the exerted anthers and the stigma exceeding the stamens. Also, all/many flowers in the spike or raceme seems to flower at about the same time. The newly described species that grows from Panama to Peru has broad floral bracts that are imbricate and mostly fully covering the sepals and bright red. The flowers are zygomorphic with the petals strongly curved, forming a cap above the anthers that are not exceeding the petals, but exposed below the petal cap and is flowering with a few flowers open at one time. Also obvious from the plate is that the peduncle of the inflorescence is very short or lacking, which is up to 7 cm long in the new proposed species.

Pitcairnia ripicola Gouda & Manzanar. *spec. nov.* Figure 2, 3 & 4

Type:—Ecuador: Prov. Morona-santiago, Limón Indanza, Cordillera del Cóndor region. Centro Shuar Kuankus, Río Coangos, at river crossing, below suspension footbridge, 310 m. elev., 03°02’22”S 78°12’37”W, growing in dense clumps of 10–20 stems on limestone rocks on banks of Río Coangos; probably underwater at periodic flood stage. 20-9-2005. *David Neill* 14668 (Holotype: QCNE!; Isotypes: F!, NY!)

Diagnosis:—*Pitcairnia ripicola* is morphologically closely related to *P. punicea* but differs in its general length 100–150(–300) cm (*vs.*30–40 cm tall), the abaxial indument of the leaf-blades glabrous (*vs.* with a thin pale membrane of coalesced trichomes), inflorescence dense with imbricate floral-bracts (*vs.* inflorescence lax with the floral-bracts remote), large ovate floral-bracts mostly exceeding the sepals (*vs.* smaller, lanceolate, shorter than the pedicel of the flower), flower subsessile (*vs.* long pedicellate), sepals elliptic (*vs.* ovate-lanceolate).

Plants flowering 100–150(–300) cm tall, rosulate and slenderly caulescent, stems often branching. **Stems** slender, covered with the remains of dead sheaths, with only rosulate leaves on distal part. **Leaves** spreading and often recurved, monomorphic, persisting, margins serrulate (at least in some parts). **Leaf-sheaths** ovate, 2.5 cm long, 1.5 cm wide, margin entire or in upper part serrate, glabrous, pale green and sometimes with a dark brown band at the base. **Leaf-blades** slightly narrowed at the base but not petiolate, linear, 20–25(–32) cm long, 0.8–1.5 cm wide; margins sometimes slightly undulate, minutely and laxly serrulate especially distally; spines of 0.5 mm long, midvein prominent, apex long attenuate and acute, glabrous on both sides, adaxially dark green and paler abaxially. **Inflorescence** simple, erect, dense or rarely subdense, 10–21 cm long, 2.2 cm wide, cylindrical, polystichously (8–)14–23 flowered, slightly lepidote or glabrous. **Peduncle** totally covered by its bracts, erect, 3–7 cm long, 5 mm in diameter. **Peduncle bracts** nearly all or the lower ones foliaceous decreasing gradually in size to ovate, erect, exceeding the internodes, imbricate, 2.5–3 cm long, 1.3 cm wide, apex acuminate or the lower ones caudate (laminate), red with green blade or apex or green. **Rachis** erect or slightly curved ascending and slightly angled, red, glabrous. **Floral bracts** ovate, suberect with divergent apex, (15–)25–40 mm long, (7–)10–33 mm wide, sometimes slightly shorter than to distinctly exceeding the sepals

(the lower ones sometimes even exceeding the flower), imbricate, ecarinate, nerved, margins entire or irregularly and sparsely serrulate, apex acuminate (the lower sometimes caudate or laminate) and upper ones acute, glabrous, olive green or red often with green acumen. **Flowers** up to 5 cm long, sub-sessile, pedicel 2 mm long, corolla zygomorphic, pistil and stamens included. **Sepals** elliptic, 15–36 mm long, 5–10 mm wide, adaxial ones (and others) ecarinate, apex acute, glabrous, green. **Petals** curved, 4.5–5 cm long, lanceolate, with one ligule at the base, ligules 8 mm long, ligules denticulate at apex, cinnebar red (yellowish at base). **Stamens** and pistil included but emerging below the petal cap, slightly shorter than the petals. **Pistil** ovary two third superior, three angled, ovules obtuse. **Seeds** slightly alate.

FIGURE 2. *Pitcairnia ripicola* in habitat on a river bank close to Limón Chiriaza, voucher: *A. Hirtz 7042* (QCNE!). A. overview of the many stemmed specimen; B. the top op the leafy stem with elongate inflorescence; C. detail of an inflorescence and flowers, showing the zygomorphic aspect of the corolla and stamens. Photos by Alexander Hirtz.

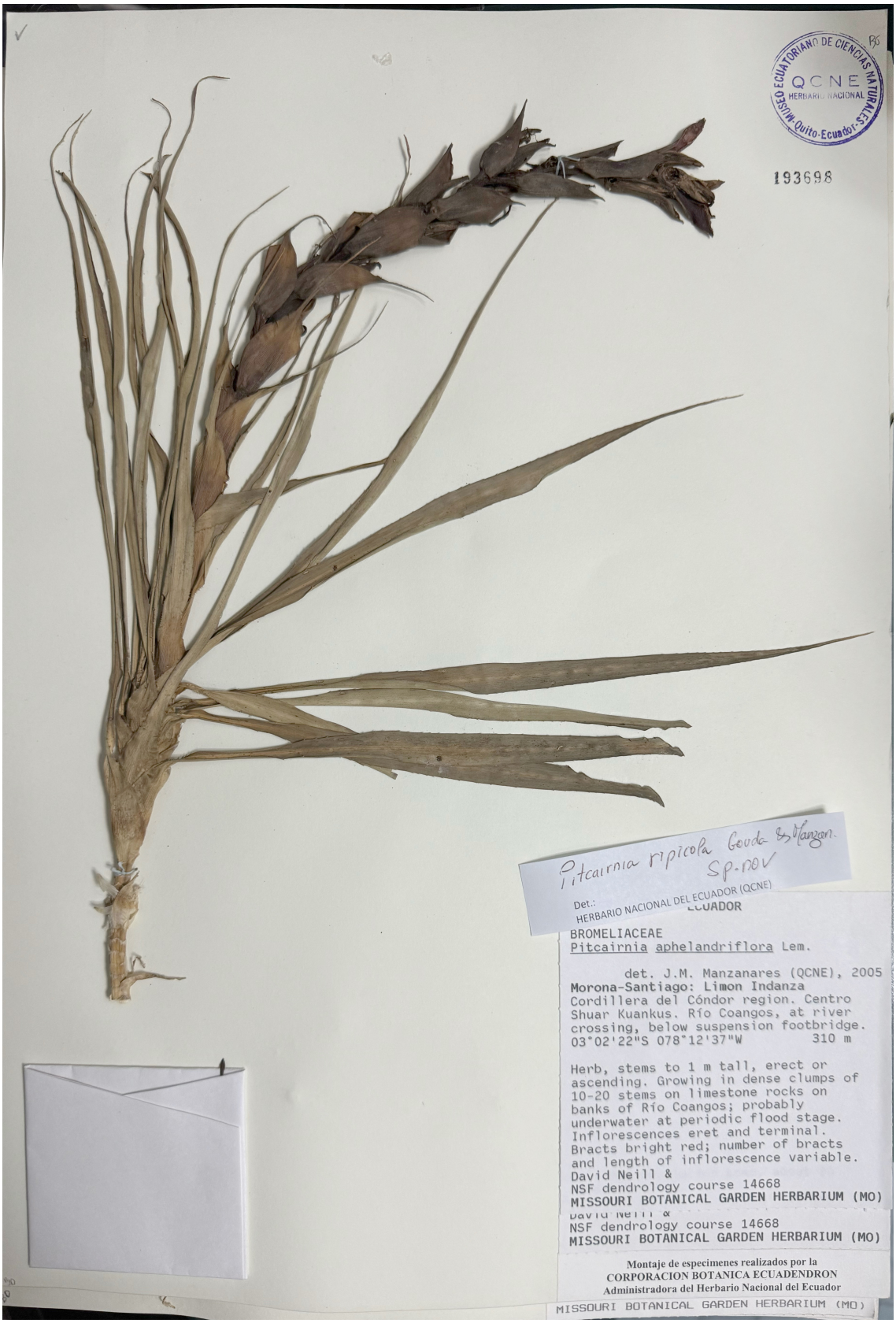

FIGURE 3. Holotype of *Pitcairnia ripicola* at QCNE. Photo José M. Manzanares.

Etymology:—The epithet 'ripicola' refers to the riparian (ripicolous) growth of the species, often growing along riverbanks or areas that get flooded regularly.

Distribution and habitat:—The species is found in following countries and divisions **PANAMA**: Bocas del Toro, Chiriquí, Veraguas, Coclé. **ECUADOR**: Napo, Morona-Santiago, Zamora-Chinchipe. **PERU**: Amazonas,

Loreto, Ucayali, often along riverbanks in primary forest or low mountain forest from 120–1350 m elevation. It forms clusters of many stems.

Specimen examined:—**PANAMA. Bocas del Toro:** 15-11-1971, *H. Kennedy & R.L. Dressler* 1248 (F!); **Chiriquí:** La fortuna hydroelectric project, on forested slope south side of river, and upriver from camp, 20-03-1978, *B.E. Hammel* 2096 (MO, USF!); **Veraguas:** Santa Fe, Valley of río Dos Bocas along road between Escuela Agricola Alto Piedra and Calovebora, 15.6 km northwest of Santa Fé; along trail to Santa Fé, steep forested hill east of river, 31-08-1974, *T.B. Croat* 27699 (MO!); Santa Fé, Vicinity Santa Fé, along road between Santa Fé and Calovebora, 1.7 miles past Alto Piedra school, 1.5 miles beyond quebrada Cosilla (previously referred to as río Primero Braso), 13-07-1994, *T.B. Croat & guang hua zhu* 76848 (MO, USF!); Santa Fé, Forest at base of Cerro Tuti [Tute], 6.5 Km outside of Santa Fé, 06-05-1977, *J.P. Folsom* 3060 (MO!); Santa Fé, NW of Santa Fé. 11 km from Escuela Agricola Alto de Piedra, in valley of Rio Dos Bocas. Atlantic slope, 20-12-1974, *S.A. Mori, J.A. Kallunki, B.A. Cochrane, T.S. Cochrane, B.F. Hansen, R.R. Kowal & M. Nee* 3877 (MO, WIS!); Santa Fé, Parque Nacional Santa Fé. Bermejo. Parte baja del Salto, 19-05-2004, *R. Aizprúa & I. Alvarez* B4181 (F!, MO, PMA). **ECUADOR. Napo:** Napo, near Mishualli. growing in riverbed, 10-05-1988, *E.J. Gouda & R. Verwer* 6 (U!); Río Napo, sin loc, 03-1983, *A.C. Hirtz* 848 (MO, SEL!, US). **Morona-Santiago:** Río Itzintza, Cordillera Cutucú, ("Oriente"), 17-11-1944, *W.H. Camp* E-1238 (MO, NY!, US); Road from Méndez to Morona, about km 100, Santiago-Yaupi, 08-1989, *A.C. Hirtz* 4390 (QCA, SEL!); Centro Shuar Kankaim, (Cangaime); 20k nw de Taisha, 17-09-1985, *D. Shiki* 112 (NY!); Via de Patuca a Morona Santiago km 76.5. Terrestre, crece en márgenes de pequeños ríos, caulescente, tallo ramificado. Inflorescencia roja con flores violáceas, 700 m, 28-08-1996, *J.M. Manzanares, H. Van Durme & P. Manzanares* 6156 (QCNE!); Limón Indanza, cerca de Limón Chiriaza. Forma densos grupos, caulescente. Inflorescencia con brácteas florales rojas y flores violáceas, 1300 m, 10-1999, *A. Hirtz 7042* (QCNE!); Limón Indanza, Cordillera del Cóndor, Centro Shuar Warints. Tributary of Río Warints, 04-10-2002, *D.A. Neill, Shuar conservation interns,* 14075 (MO, NY!, QCNE!, SEL!); Palora, Río Pastaza y Río Tuna Chiguaso, 08-1994, *J.M. Manzanares, K. Bracke, Pablo, Nele, & Rebeca Manzanares* 5175 (MO, QCNE!, SEL!); Cordillera de Cutucú, Western slopes, along a trail from Lograño to Yaupi, in the general region of coordinates below. Common along rocky river banks, Río Chihuasi, 11-1976, *M.T. Madison , E.O. Bush III, E. W. Davis,* 3628 (SEL!); Tiwintza, Región de la Cordillera de Cutucú, al norte del río Santiago, cantón Tiwintza, Centro Shuar Yapapas. Bosque húmedo tropical, de tierras bajas, en bosque maduro, medianamente intervenido, por el sendero que conduce desde la carretera a la comunidad. Informante: Diego Mariana, 28-10-2005, *C. Morales & grupo Shuar de conservación* 1445 (AAU, HUT, LOJA, MO, QCNE, SEL!). **Zamora-Chinchipe:** Nangaritza, Cordillera del Cóndor, "Area de Conservación Los Tepuyes". Along banks of the Río Nangaritza, in the sandstone-walled canyon between Miazi and Shaime, 17-09-2007, *D.A. Neill, C. Davidson, S. Christoph & W. Quizhpe* 15797 (MO, QCNE!, SEL!); Nangaritza, Río Nangaritza, on rocks; scape bracts red; flowers not present; 04°15'35"S 78°39'23"W, 852 m, 17-09-2007, *T.B. Croat & G. Ferry* 98734 (QCNE!). **PERU. Amazonas:** Bagua, Dtto. Imaza. Comunidad Aguaruna de Kusd-Listra. Cerro Apág, margen derecha Quebrada Kusd. Bordes Quebrada Kusd, 19-09-1996, *C. Diaz S. , A. Pena, Ruben Tiwi & David Shuwin,* 8286 (MEXU, MO, SEL!); Condorcanqui, Río Cenepa, vicinity of Huampami, ca. 5 km. east of Chávez Valdívia, camino de Chigkan Entsa. En bosque primario, 08-01-1978, *E. Ancuash A.* 1237 (F!, MO); Condorcanqui, Río Cenepa region, Quebrada Nahem, Monte, 15-07-1974, *R. Kayap* 1805 (F!, MO). **Loreto:** Río Pumayacu, Balsapuerto, 30-08-1938, *C.A.W. Sandeman* 136 (K, MO, P!). **Ucayali:** Padre Abad, Distr. Padre Abad. Carretera a Alto Miraflores, cerca al Río Negro, 13-09-2004, *J. Schunke V. , J.G. Graham,* 15927 (BRIT, F!, G, MOL, SEL!).

Observations:—The newly described species that grows from Panama to Peru differs from *Pitcairnia aphelandriflora* in having broad floral bracts that are imbricate and mostly fully covering the sepals and bright red bracts (*vs.* relatively narrow green floral bracts that are exposing part of the sepals and are not imbricate at all), the flowers are zygomorphic with the petals strongly curved, forming a cap above the anthers that are not exceeding the petals, but exposed below the petal cap stamens (*vs*. actinomorphic flowers with straight convergent petal apices with the exerted anthers and the stigma exceeding the stamens), and is flowering with a few flowers open at one time (*vs.* all/many flowers in the spike or raceme seems to flower at about the same time), additionally, the peduncle of the inflorescence is up to 7 cm long (*vs.* very short or lacking).

Remarkable is that this new species is not yet found in Colombia, but is expected there, especially in the Amazonian region. The material from Panama does not seem to be very different from the Ecuadorian material although one specimen from the prov. Veraguas was observed with green floral bracts, but others (e.g. *R. Aizprúa* B4181) also from Veraguas are reported to have red floral bracts. The species is close to *Pitcairnia punicea* that grows in a similar habitat and elevation in Mexico, Belize and Guatemala, but is larger in size and has imbricate often red floral bracts that are exceeding the sepals of the (sub)dense subsessile flowers, *vs.* green and shorter than the pedicels of the remote flowers

(see also diagnose and table 1). No detail information about *P. aphelandriflora* is known and there for not included in table 1.

TABLE 1. Comparing the new species *Pitcairnia ripicola* with *P. punicea*

	Pitcairnia ripicola	*Pitcairnia punicea*
plants		
- size (flowering)	100–150(–300) cm tall	30–40 cm tall
leaf-sheaths		
- form	ovate	narrowly ovate or deltoid
leaf-blades		
- apex	attenuate	filiform
- indument (abaxially)	glabrous	with a thin pale membrane of coalesced trichomes
inflorescence		
- density	dense	lax
- indument	slightly lepidote or glabrous	furfuraceous-lepidote
peduncle		
- diameter	5 mm	2–3 mm
floral bracts		
- form	ovate	lanceolate
- relative length	slightly shorter than the sepals-exceeding the sepals	the lower ones exceeding the pedicel and the others much shorter than the pedicel
- imbricate or remote	imbricate	remote
flowers		
- pedicel	sub-sessile	long pedicellate
- pedicel length	2 mm	10–30 mm
sepals		
- form	elliptic	ovate-lanceolate
- indument	glabrous	floccose
- color	green	red
petals		
- length	4.5–5 cm	5–5.7 cm

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