Five New Species of *Cissus* (Vitaceae) from Northern Brazil

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**ABSTRACT.** *Cissus acreensis, C. amapaensis, C. appendiculata, C. araguainensis, and C. paraensis,* new species of Vitaceae, are described from northern Brazil. These species are distinct in many characters, mainly trichomes, leaf dimorphism, flower disc, fruits, and seeds. In addition to descriptions and illustrations, comments on probable relationships and distributions are presented.

*Cissus,* with approximately 350 species (Mahberapa, 1987), is the largest genus of Vitaceae. The 31 species described and listed by Baker (1871) in the genus *Vitis* were transferred to *Cissus* by Planchon (1887). Since his work few other species have been described from Brazil (but see Malme, 1901; Hoehne, 1915, 1938; Kuhlmann, 1938). While working on a taxonomic survey of *Cissus* in South America, five undescribed species were found in northern Brazil: *Cissus acreensis, C. amapaensis, C. appendiculata, C. araguainensis,* and *C. paraensis.*

**Cissus acreensis** Lombardi, sp. nov. TYPE: Brazil.

Acre: Cruzeiro do Sul, rio Jurua, km 18 road Cruzeiro do Sul to Japiim, forest on terra firme, 26 Oct. 1966, France et al. 2843 (holotype, UEC; isotype, NY). Figure 1A–F.

Frutex scandens, *C. verticillatae* (L.) Nicolson & Jarvis similis, sed in ramis vegetabilibus folii triangularibus et in ramis fertilibus folii ellipticos vel obovatis, concoloribus, et epicarpo incrassato differt.

Liana, stems glabrous, terete. Tendrils not seen. Stipules 0.1 cm long, 0.15 cm wide, deltate, fleshy, glabrous, caducous. Petioles 1–4 cm long, canaliculate, glabrous. Leaf blades simple and entire, triangular on vegetative shoots, elliptic to ovate on reproductive shoots, 5–7 cm long, 1.7–5.5 cm wide, herbaceous, glabrous, drying dark, concolorous, the base reniform to cuneate, the apex acuminate, the margin denticulate. Inflorescence flat-topped, glabrous; the peduncle 0.5–2 cm long; the bracts triangular, 0.1 cm long, glabrous, ciliate. Flowers greenish to pinkish; pedicels 0.1–0.2 cm long, glabrous; calyx truncate, the lobes obscure-triangular, 0.1 cm long, 0.1–0.2 cm diam., fleshy, glabrous; corolla tetramerous, 0.1–0.2 cm long, 0.1–0.15 diam., petals coherent, caducous, glabrous; stamens 4, connective cuneiform, granular, drying clear, anther latrorse; disc side concave, apex convex; the style terete, the stigma not apparent. Fruit purple, botuliform, smooth, thick-skinned, 1.5 cm long, 0.8 cm wide. Seed 1, subfusiform, 1.2 cm long, 0.5 cm wide, the hilum acute, the raphe obsolete, the sides irregularly rugose.

This species is known from the state of Acre in Brazil, and for this is named "acreensis." It grows in borders of primary and secondary vegetation.

*Cissus acreensis* differs from other South American species of *Cissus* by its simple leaves and large seeds in thick-skinned fruits. It is similar to *C. verticillata* subsp. *verticillata,* but differs in having concolorous and dimorphic leaves that dry dark, thick-skinned fruits, and bigger seeds.

**Paratypes.** BRAZIL. Acre: Cruzeiro do Sul, Monte Belo, margem esquerda do rio Moa, 15 Feb. 1976, *Marinho 198* (NY); Cruzeiro do Sul, próximo ao aeroporto, projeto RADAM, 16 Feb. 1976, *Monteiro & Damiao 435* (MG); rio Acre, Seringal Auristella, Mar. 1911, *Ule 9381* (FL). **Cissus amapaensis** Lombardi, sp. nov. TYPE: Brazil. Amapá: Mazagão, área do experimento de manejo do convênio JARI/EMBRAPA, floresta tropical primária de terra firme, 19 June 1986, *M. J. Pires & N. T. Silva 1234* (holotype, NY). Figure 1G–I.

Frutex scandens, pilosus, pilis malpighiaceis, folis ternatis, *C. erosae* Richard similis, sed foliis apice acuminas vel caudatis, inflorescentia in ramis subapillus differt.

Liana, stems glabrous to sericeous on nodes, terete. Trichomes malpighiaceous. Tendrils with several bifurcate branches, adhesive discs not seen, glabrous; scales not seen. Stipules 0.2–0.3 cm long, 0.15–0.35 cm wide, triangular, fleshy, glabrous, ciliate, persistent. Petioles 4–4.5 cm long, canaliculate, glabrous. Leaves absent on the distal portion

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Figure 1. A-F, *Cissus acreensis* Lombardi. —A. Reproductive branch above and vegetative leaf below. —B. Nectariferous disc and pistil. —C. Flower bud. —D. Stipule. —E. Stamens, ventral and lateral views. —F. Seed. G-I, *Cissus amapaensis* Lombardi. —G. Reproductive branch. —H. Flower bud. —I. Nectariferous disc and pistil. J-O, *Cissus araguaianensis* Lombardi. —J. Seed. —K. Stamens, ventral and lateral views. —L. Reproductive branch above and vegetative leaf below. —M. Stipule. —N. Nectariferous disc and pistil. —O. Flower bud. A–E drawn from Prance et al. 2843; F from Monteiro & Damídio 435; G–I from M. J. Pires & N. T. Silva 1234; J from Irwin et al. 21191; K–O from Irwin et al. 21084a. Scales: A, G and L = 1 cm; B–F, H–K and M–O = 1 mm. Drawn by the author.
of reproductive shoots, blade ternately compound; central petiolules 1–1.5 cm long, laterals 0.3 cm long, the base sericeous; blades of central leaflets elliptic, 11.5–12 cm long, 3–3.5 cm wide, blades of lateral leaflets subelliptic, 7.9–9.4 cm long, 2–2.7 cm wide, herbaceous, glabrous on adaxial side, sparsely sericeous on midvein on abaxial side, the base cuneate, the apex acuminate to caudate, the margin denticulate. Inflorescence flat-topped, apex sparsely sericeous; the peduncle 1.5–1.7 cm long; the bracts deltate, 0.1 cm long, the base sericeous, ciliate. Flowers red; pedicels 0.25–0.3 cm long, glabrous; calyx truncate, 0.15 cm long, 0.2 cm diam., fleshy, papillose, glabrous; corolla tetracerous, 0.15 cm long, 0.15 cm diam., petals coherent, caducous, papillose, glabrous; stamens 4, connective deltate, granular, drying dark, anther extrorse; disc apex obconic; the style conic, the stigma slightly clavate. Fruit not seen. Seed not seen.

This species is known from a unique collection in the rainforest of Amapá State in Brazil, and for this is named “amapaensis.” I have failed to locate other specimens and isotypes in Museu Göeldi (MG), Instituto de Pesquisas da Amazônia (INPA), and Centro de Pesquisas do Trópico Úmido (IAN) herbaria. The presumed restricted distribution of this species places it in an endangered situation.

This species differs from other trifoliolate South American Cissus species by acuminate to caudate leaflets and malpighiaceous trichomes. It is similar to C. erosa subsp. erosa but differs in the caudate apex and shape of the leaflets, inflorescences borne in reproductive shoots with leafless apices and longer flowers.

**Cissus araguaíensis** Lombardi, sp. nov. **TYPE:**

Brazil. Tocantins: cut-over gallery forest, land of George Yunes & Cia, Araguaína, rio das Lontras, ca. 300 m, 13 Mar. 1968, Irwin et al. 21084a (holotype, UB [as 21084]). Figure 1J-O.

Frutex scandens, pilosus, pilis uni et bicellularibus et malpighiaceis, C. verticillatae (L.) Nicolson & Jarvis similis, sed pilis, folias ellipticas, parum dicoloribus; pedicellis puberulis; semine subpyriformi, 0.7 cm longo, 0.3 cm lato differt.

Liana, stems puberulous, sometimes with elliptic lenticels, terete. Trichomes unicellular to bicellular and adpressed malpighiaceous. Tendrils not branched, glabrous, adhesive discs not seen; scales 0.1 cm long, deltate, glabrous, ciliate. Stipules 0.2–0.3 cm long, 0.15–0.2 cm wide, triangular to elliptic, fleshy, puberulent, ciliate and sinuate, persistent. Petioles 0.4–1.7 cm long, canaliculate, sparsely puberulent in the base. Leaf blades simple and entire, elliptic, 5.7–13.5 cm long, 1.5–6.2 cm wide, herbaceous, glabrescent to puberulent on the abaxial side, the veins on the abaxial side with minute spines, slightly bi-colored, the base cuneate, the apex acuminate, the margin denticulate. Inflorescence flat-topped, puberulent; the peduncle 1.2–2.5 cm long; the bracts triangular, 0.1–0.15 cm long, glabrous, ciliate. Flowers greenish; pedicels 0.15–0.25 cm long, sparsely puberulent; calyx truncate, 0.05–0.1 cm long, 0.1 cm diam., fleshy, puberulent on the base; corolla tetratomorous, 0.1–0.2 cm long, 0.1–0.15 cm diam., petals coherent, caducous, glabrous; stamens 4, connective cuneiform, granular, drying clear, anther latrorse; disc side concave, apex convex; the style terete, the stigma slightly clavate. Fruit purple, subspheric, smooth, 0.5 cm diam. Seed 1, subpyriform, 0.7 cm long, 0.3 cm wide, the hilum acute, the raphe prominent and transversely grooved, the sides smooth.

This species is named for the type locality, and is known from other states in northern Brazil where it occurs in borders of forests and savanna areas (cerrado). I know of no explanation for this apparent disjunction, except for the general lack of liana collections, chiefly in the Amazon basin.

This species differs from other simple-leaved species by seed shape and the combination of unicellular, bicellular, and malpighiaceous hairs. It is similar to *Cissus verticillata* subsp. *verticillata*, but differs in having bicolored leaves, in seed shape, and in the presence of malpighiaceous hairs.

**Paratypes.** BRAZIL. Maranhão: Fortuna, lugar Caíçara a 15 km SE de Fortuna, 03°48'S, 44°03'W, 21 Feb. 1983, J. U. Santos et al. 633 (F, MO, NY). Pará: Conceição do Araguaia, ca. 20 km W of Redenção, near córrego Sao Joao and Troncamento Santa Teresa, ca. 08°03'S, 50°10'W, 350–620 m, 8 Feb. 1980, Plowman et al. 8490 (MO, NY). Tocantins: land of George Yunes & Cia, Araguaína, at rio das Lontras, ca. 300 m, 14 Mar. 1968, Irwin et al. 21191 (NY, UB); margem direita do rio Tocantins, canteiro de obras da Usina Hidrelétrica da Serra da Mesa, 23 Feb. 1991, B. A. S. Pereira et al. 1544 (US).

**Cissus appendiculata** Lombardi, sp. nov. **TYPE:**

Brazil. Pará: Marabá, Serra dos Carajás, canga do N-4, 25 Jan. 1985, Nascimento & Bahia 961 (holotype, MG). Figure 2A–F.

Frutex scandens, pilosus, pilis longis et ferrugineis; foliis ternatis, C. surinamensis Descoins similis, sed calyce basi 1–3 appendiculat, appendiculis ligulatis differt.

Liana, stems hispid, terete. Trichomes not rami-fied, multicellular, long or short and not secretory or rarely capitate and secretory. Tendrils with several bifurcate branches, with adhesive discs, his-
Figure 2.  A–F, *Cissus appendiculata* Lombardi. — A. Reproductive branch. — B. Flower bud. — C. Nectariferous disc and pistil. — D. Seed. — E. Stipule. — F. Stamens, ventral, lateral, and dorsal views. G–L, *Cissus paraensis* Lombardi. — G. Reproductive branch. — H. Flower bud. — I. Stipule. — J. Nectariferous disc and pistil. — K. Seed. — L. Stamens, ventral, lateral, and dorsal views. A and D drawn from *A. S. L. Silva et al. 1940*; B, C and E, F from *Nascimento & Bahia 961*; G, K from *Plowman et al. 9612*; H, J, and L from *Lisboa et al. 1256*; I from *M. J. F. Pires et al. 838*. Scales: A and G = 1 cm; B–F and H–L = 1 mm. Drawn by the author.
Frutex scandens, foliis ternatis, C. trigonaef Willdenow ex Schultes & Schultes f. similis, sed stipulé et bracteis rari gibbosis, basi calicis disciforme differt.

Liana, stems glabrous to rarely sparsely puberulent, terete to winged on older stems. Trichomes rare and not ramified, multicellular. Tendrils with several bifurcate branches, with adhensive discs, glabrous; scales 0.1 cm long, triangular, glabrous, the base gibbous. Stipules 0.3–0.6 cm long, 0.2–0.4 cm wide, deltate, fleshy, glabrous to rarely puberulent in its gibbosity, the base gibbous and drying dark, the margin darkened and revolute. Petioles 1.7–8.3 cm long, canaliculate, glabrous to rarely puberulent. Leaf blades ternately compound; central petioles 0–1.4 cm long, laterals 0–0.5 cm long, glabrous to rarely puberulent; blades of central leaflets elliptic to oblurultrulate, 3.5–17.4 cm long, 1–10.1 cm wide, blades of lateral leaflets subelliptic, 1.4–12.9 cm long, 0.5–7.9 cm wide, herbeaceous, glabrous to rarely puberulent, chiefly along the veins on the abaxial side, the base cuneate, the lateral leaflets rarely lobulate, the apex acute to acuminate, the margin denticulate. Inflorescence flat-topped, glabrous to rarely puberulent; the peduncle 1.1–6.2 cm long; the bracts triangular, 0.15–0.2 cm long, the base gibbous and drying dark, the margin crispate. Flowers greenish to rarely red; pedicels 0.2–0.35 cm long, papillose, glabrous to rarely puberulent; calyx truncate, 0.1–0.15 cm long, 0.2–0.5 cm diam., fleshy, glabrous to rarely puberulent, the base laterally discoid; corolla tetramerous, 0.1–0.15 cm long, 0.1–0.15 cm diam., petals coherent, caducous, the apex hispid; stamens 4, connective deltate, granular, drying dark, anther extrorse; disc apex concave with a central depression; the style terete, the stigma slightly clavate. Fruit purple, conic, drying sulcate, smooth to tuberculate, 1.0 cm long, 0.65 cm wide. Seed 1, subdolabririform, 0.8 cm long, 0.5 cm wide, the apex obcordate, the raphe prominent and transversely grooved, the sides slightly rugose.

This species is known from northeastern Brazil, chiefly in areas of iron mining (the "cangas") in the Serra dos Carajás, Pará State, and savanna areas (cerrado). The intense commercial exploration of this area is a menace for this species in the area of principal (and type) collections.

The unique calyx of Cissus appendiculata differs from that of all other species of Cissus. I know of no similar species in the Neotropics. The relationships of this species are therefore obscure, despite some similarity to Cissus surinamensis Descoings in leaf aspect.

Paratypes. BRAZIL. MARANHÃO: Monção, rio Pindaré, June 1944, Fréa 20253 (NY). PARÁ: Monte Alegre, 6 May 1958, Andrade-Lima 55–1391 (IPA); Serra dos Carajás, 20–25 km NW of Serra Norte mining camp, ca. 05°55’S, 50°26’W, 6 Dec. 1981, Daly et al. 1776 (F, NY); Serra dos Carajás, Marabá, 14–15 km, 20 Mar. 1984, A. S. L Silva et al. 1940 (MG, NY). TOCANTINS: ca. 5 km N of Araguaína, ca. 300 m, 14 Mar. 1968, Irwin et al. 21176 (UB).

Cissus paraensis Lombardi, sp. nov. TYPE: Brazil. Pará: Tucuruí, km 25 S of Represa Tucuruí on road (BR 422) to Breu Branco, ca. 03°52’S, 49°44’W, 90 m, 15 Mar. 1980, Plowman et al. 9612 (holotype, MC; isotypes, F, NY). Figure 2G–L.

This species is named for Pará State in Brazil, where the type material was collected. It occurs in the secondary and primary forests and savannas (campina and campinarana). This species differs from others with ternately compound leaves in its stipules and bracts that are prominently gibbous and dark on drying, and in its discoid calyx.

Cissus paraensis is similar to C. trigonaef Willdenow ex Schultes & Schultes f., but can be easily distinguished by the smaller leaves and seeds, the discoid calyx, and fruits that are not thick-skinned.

Paratypes. BRAZIL. ACRE: Rio Branco, Rio Branco-
Porto Velho Highway, between km 22–42, 28 Mar. 1979, Albuquerque et al. 1276 (NY, US). **Amazonas**: Manicoré, BR 230, 120 km de Humaitá, reserva indígena dos Tenharim, 07°55'S, 62°00'W, 15 Apr. 1985, Cid 5531 (F, MG, NY, US). **Pará**: Almeirim, monte Dourado, área da água Azul, 01°05'S, 52°70'W, 26 Mar. 1986, M. J. Pires et al. 838 (INPA, MG, NY); Tucuruí, margem direita do rio Tocantins, BR 263, ramal à direita do km 16, 29 Jan. 1980, Lisboa et al. 1256 (INPA, NY).

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