

## Two new species and a new combination in Amazonian *Heteropsis* (Araceae)

M. L. Soares<sup>1</sup>, S. J. Mayo<sup>2</sup>, T. B. Croat<sup>3</sup> & R. Gribel<sup>1</sup>

**Summary.** The species of the genus *Heteropsis*, known throughout Brazilian Amazonia as “cipó-titica”, have long been the target of intensive commercial collection because of the valuable fibre which is made from their aerial roots. The fibre is widely used in regional craft manufacture and forms part of the extractive industry of the region, based on forest products. In this study, two new species are described, *Heteropsis duckeana* M. L. Soares and *H. croatii* M. L. Soares, and a new combination is made, *H. robusta* (G. S. Bunting) M. L. Soares; descriptions, illustrations and conservation status are given.

**Resumo.** As espécies do gênero *Heteropsis* conhecido na Amazônia brasileira como cipó-titica, tem sido alvo de intensas coletas comerciais na região por ser fonte de fibras valiosas adquiridas a partir das raízes aéreas. Estas raízes são muito utilizadas para confecção de artigos artesanais, fazendo parte da economia extrativista da região, baseada em produtos florestais. Neste trabalho, duas novas espécies e uma nova combinação do gênero *Heteropsis* são descritas, a saber: *H. duckeana* M. L. Soares, *H. croatii* M. L. Soares e *H. robusta* (G. S. Bunting) M. L. Soares respectivamente; descrições, ilustrações e avaliações do estado de conservação de cada espécie são fornecidos.

**Key Words.** Araceae, Amazonia, cipó-titica, conservation, *Heteropsis*, new taxa, non-timber forest products.

---

### Introduction

The genus *Heteropsis* Kunth is composed of about 17 species (including those described here) confined to tropical America and most diverse in South America (Govaerts *et al.* 2007; Mayo *et al.* 1997). In Brazil the genus is restricted to Amazonia and the Atlantic forest.

The species are known throughout Brazilian Amazonia as “cipó-titica”, and have long been the target of intensive commercial collection because of the valuable fibre made from the aerial roots. These roots are widely used in regional craft manufacture and form part of the extractive industry of the region, based on forest products (Galvão 1959; Milliken *et al.* 1992; Potiguara & Nascimento 1994; Durigan 1998).

### Methods

All specimens cited have been seen unless otherwise indicated. The study of the morphology and geography of the species is based on observation of both living

material (*Heteropsis duckeana*, *H. robusta*) and dried specimens deposited in the herbaria cited under the species descriptions. The citation of the collections studied is in alphabetical order of country, state, municipality and locality. Specimens without collector's numbers are cited using the catalogue number (when available) of the herbaria where they are deposited. Measurements of leaves and internodes were made from the mature, free, plagiotropic shoots, which provide the best vegetative diagnostic characters. The plagiotropic shoots grow more-or-less horizontally from vertical shoots fixed to the host plant by anchor roots. The inflorescences are borne on the plagiotropic shoots, which show sympodial patterns of growth. The fertile axes themselves also provide some useful diagnostic characters, including differences in number and size of the internodes, and persistence of cataphylls and euphylls. All measurements, including those of the reproductive organs, were made with a Mitutoyo digital caliper.

---

Accepted for publication November 2008.

<sup>1</sup> Instituto Nacional de Pesquisas da Amazônia, Av. André Araújo 2936, Bairro Petrópolis, CPBO-INPA, 69083-000, Manaus, Amazonas, Brazil.

<sup>2</sup> Herbarium, Royal Botanic Gardens Kew, Richmond, Surrey TW9 3AB, UK.

<sup>3</sup> Missouri Botanical Garden, P.O. Box 299, St. Louis, MO 63166, USA.

**Heteropsis duckeana** M. L. Soares sp. nov. *H. rigidifolia* Engl. affinis sed folii lamina subcoriacea, subpatenti nec rigida (*H. rigidifolia*: coriacea, patens, rigida), internodiis 2 – 3 cm longis (*H. rigidifolia*: 1.5 – 2 cm longi), petiolo 5 – 8 mm longo (*H. rigidifolia*: 3 – 5 mm longus), spadice 3.8 – 5.3 cm longo, 1 – 1.5 cm lato (*H. rigidifolia*: 1.5 – 3 cm longus, 0.6 – 0.8 cm latus), semine 1 – 1.5 cm longo, 0.9 – 1.3 cm lato (*H. rigidifolia*: 0.8 cm longum, 0.4 – 0.5 cm latum) differt. Typus: Brazil, Amazonas, Manaus, Reserva Florestal Adolfo Ducke, km 0.35 caminho alojamento-torre, 8 Nov. 2002, M. L. Soares 503 (holotypus INPA; isotypi K, MG, MO, RB).

*Plant* scandent climbing to 35 m high, shoot leafy, aerial roots c. 7 – 8 mm diam., subcylindric, reddish brown when young, grey when mature; internodes 2 – 3 cm × 4 – 9 mm, brown, longitudinally striated when dry, somewhat flattened on one side, rounded on the other; lateral bud 1 – 2 mm long, apex rounded. *Leaf*: petiole 5 – 8 × 2 – 3 mm, usually twisted, margin paler; geniculum c. 3 mm long, darker than petiole; blade 9 – 17 × 2.5 – 4 cm, elliptic-lanceolate, subpatent, olive green when fresh, becoming brown when dry, glossy, subcoriaceous, 2.2 – 2.8 mm thick, apex acute, base cuneate, margin revolute, slightly sinuate, lateral veins numerous, obscure on both sides when fresh, visible when dry, submarginal collective vein 2 – 3 mm distant from margin, outer submarginal veins 1 – 2. *Inflorescence*: terminal and axillary, fertile shoot 2.5 – 7 cm long, internodes 0.5 – 1.5 cm × 3 mm, with 1 – 2 small, persistent euphylls at the most apical nodes; peduncle short, 1 – 1.5 cm long, 3 – 4 mm diam.; spathe 2.5 – 5 × 4 – 5.8 cm when expanded, yellow on both sides, inflated, convolute, apex shortly acuminate, margin cream, spathe of floral buds 2 – 3 cm × c. 8 mm, dark green; spadix 3.8 – 5.3 × 1 – 1.5 cm, cylindric, apex weakly acuminate, pale yellow, stipitate; stipe 1.5 – 2 × c. 3 mm. *Flowers*: stamens 3 – 4 × 1.25 – 1.7 mm, anther 1 × 1.5 mm; gynoecium 3 – 3.5 × c. 3.5 mm, obpyramidal; ovary 2.5 × 1.8 mm; locules 2 per ovary; ovules 2 per locule, 0.6 – 1 × 0.7 mm, anatropous, subsessile; placenta basal to subbasal; stigma 1 – 1.5 mm long, oblong-elliptic. *Infructescence*: 6 – 6.5 × 2.3 – 3.2 cm; berry 1 – 1.7 cm × 9 – 18 mm, apex 6 – 8 mm diam., subobovoid, yellow, pulp yellow; seeds 1 – 2 per berry, 1 – 1.5 × 0.9 – 1.3 cm, obovoid, testa rugose. Fig. 1.

**DISTRIBUTION.** Known only from Central Amazonia, Brazil (Map 1).

**SPECIMENS EXAMINED.** BRAZIL. Amazonas: Itacoatiara, Mil Madeireira, 12 Dec. 1999, M. L. Soares et al. 486 (INPA fl.); Manaus, Reserva Florestal Adolfo Ducke caminho alojamento-Torre, 0.35 km, 8 Nov. 2002, M. L. Soares 503 (INPA fl.); 6 Jan. 2005, M. L. Soares & E. C. Pereira 759 (INPA fr.); 13 Oct. 1994, A. Vicentini, 747 (INPA fl.); Pará: Itaituba, Parque Nacional do

Tapajós, km 60 da estrada Itaituba-Jacarecanga 20 Nov. 1978, G. Silva & C. Rosário 3852 (MG, K, U, fl.).

**HABITAT.** In terra firme plateau forest (*floresta de platô*); c. 150 m. Collected in flower between October and December, in fruit in January.

**CONSERVATION STATUS.** Vulnerable (VU). Rare in the Adolfo Ducke forest reserve, where it is known only from a single highly branched individual collected at a height of 35 m on its host tree. As a canopy-dwelling species it is probably undercollected.

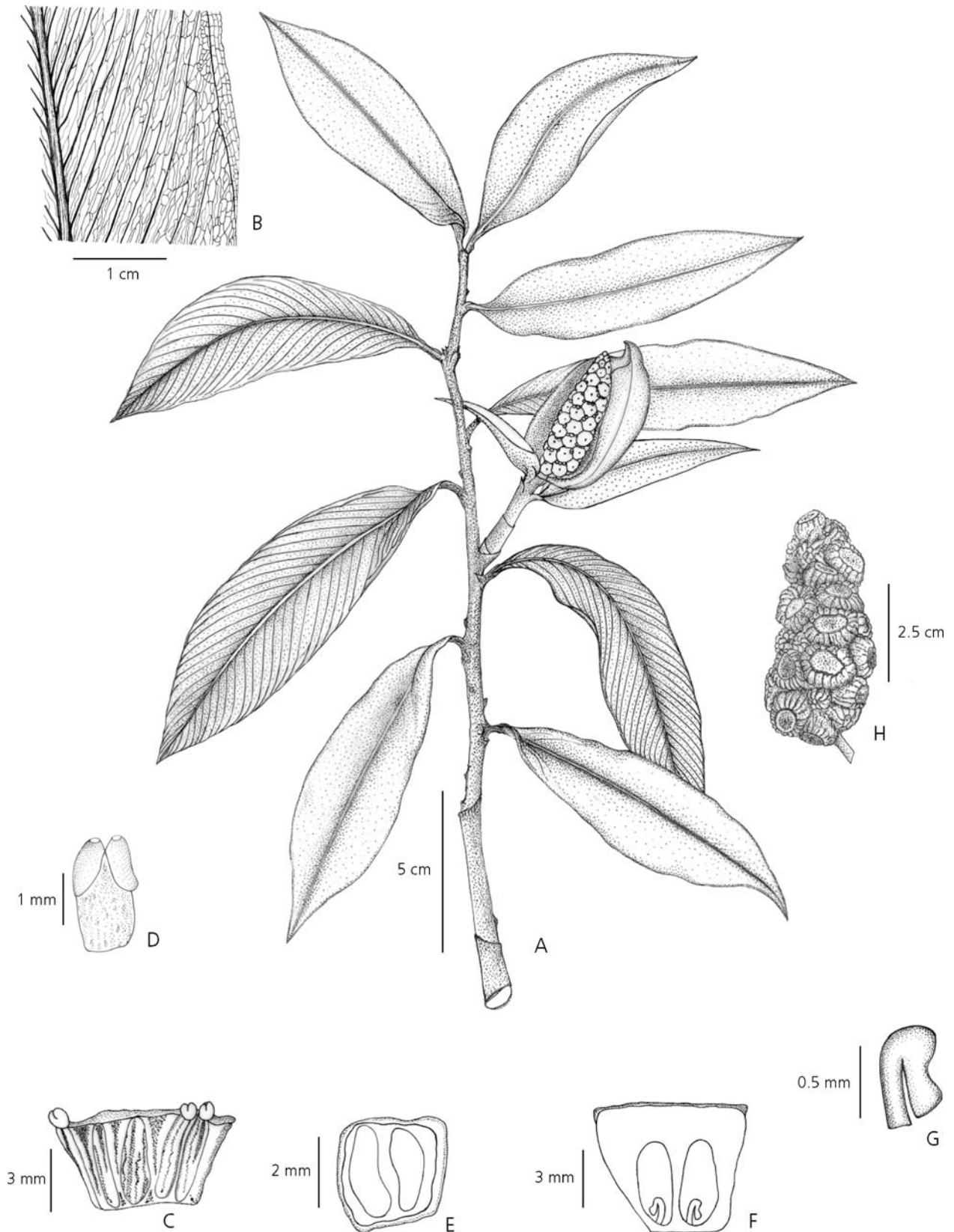
**ETYMOLOGY.** The specific epithet refers to the collecting locality where this species was first recognised, the Reserva Florestal Adolfo Ducke belonging to the Instituto Nacional de Pesquisas da Amazônia (INPA), in the municipality of Manaus, Brazil.

**NOTES.** *Heteropsis duckeana* is morphologically similar to *H. rigidifolia* from the Atlantic Forest but differs in the less coriaceous, non-rigid, and less spreading leaf blade, longer internodes and petioles, and especially in the larger size of the spadix and seeds. In *H. rigidifolia* the internodes are 1.5 – 2 cm long, the petiole 3 – 5 cm long, the leaf blade is coriaceous, rigid and spreading, the spathe is 2 – 2.5 cm long, the spadix 1.5 – 3 cm long, 0.6 – 0.8 cm diam. and the seed 8 mm long, 4 – 5 mm diam. The aerial roots of *H. duckeana* have lenticels throughout and the anchor roots adhering to the host tree are flattened and velvety reddish-brown. The ovary locules contain a transparent mucilaginous substance which dries rapidly on exposure to air.

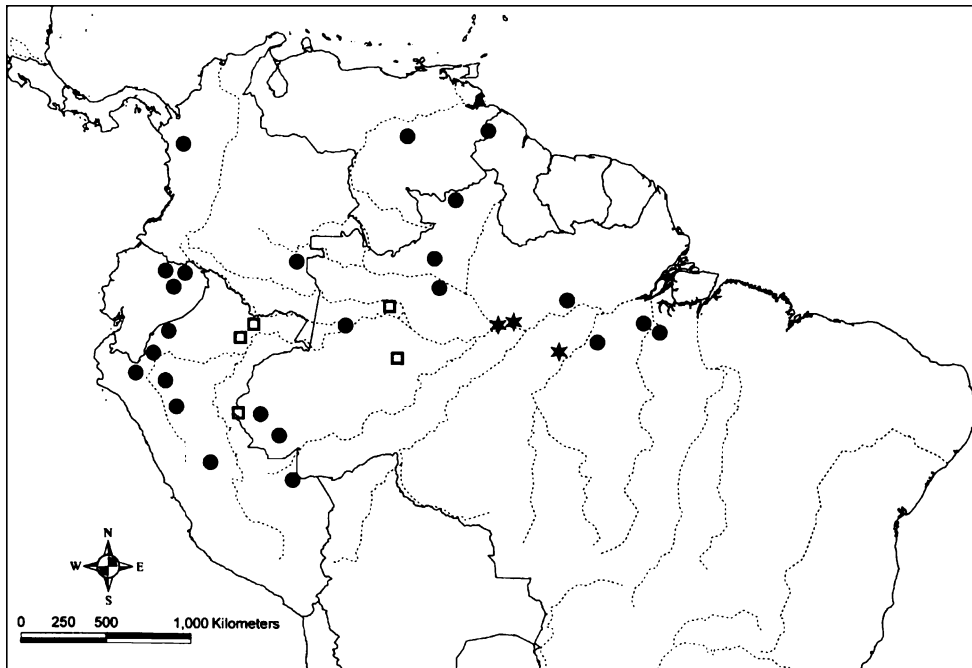
A study of the root anatomy of *Heteropsis* species in the Reserva Adolfo Ducke (M. L. Soares, unpublished), showed that *H. duckeana* differs from other species in the presence of brachysclereids in the central cylinder.

**Heteropsis croatii** M. L. Soares sp. nov. internodiis quadrangularibus, forma laminae folii, statura inflorescentiae *H. robusta* (G. S. Bunting) M. L. Soares affinis, sed costa laminae folii pagina abaxiali non flavescenti, nervis lateralibus primariis pagina adaxiali impressis, ramis inflorescentiarum crassioribus, pedunculo breviori, extrorse torto, spatha cuspidata spadici maiori differt. Typus: Brazil, Acre, Cruzeiro do Sul, Rio Moa, 7°38'S, 73°36'W, 21 Aug. 1986, T. B. Croat & A. J. Rosas 62424 (holotypus INPA; isotypi K, MO).

*Plant* hemiepiphytic, scandent; internodes 3 – 5 cm × 2.8 – 5 mm, longitudinally striate when dried, quadrangular, usually sulcate, grey-greenish brown; lateral bud c. 1 – 2 mm long, straight to introrsely curved, with pointed apex. *Leaf*: petiole 5 – 8 × 1.6 – 2.8 mm; sheath very often sinuate at the margin, especially those of the flowering shoot; geniculum c. 4 mm long; leaf blade 15 – 26 × 5 – 8.4 cm, oblanceolate, subcoriaceous, greenish brown on both surfaces when dried, 1.1 – 2.7 mm thick, apex 1.5 – 2.5 cm long, acuminate-



**Fig. 1.** *Heteropsis duckeana*. A habit; B leaf venation, detail; C flower, lateral view; D stamen, anterior view; E ovary, in T.S.; F gynoecium, in L.S.; G ovule, lateral view; H infructescence. A – G from M. L. Soares *et al.* 503 and 759). DRAWN BY FELIPE FRANÇA MORAIS.



**Map 1.** Geographical distribution of *Heteropsis duckeana* (\*); *H. croatii* (□) and *H. robusta* (●).

attenuate, base shortly attenuate, midrib weakly sulcate, primary and secondary lateral veins impressed on the upper surface, prominent on lower surface, submarginal collective vein prominent, c. 1.5 mm from margin, with a single outer submarginal vein. *Inflorescence*: terminal and axillary, flowering shoot 3.5 – 10.5 cm long, internodes 1.5 – 3 cm × 1.8 – 3 mm, matt brown, weakly quadrangular; peduncle 0.5 – 0.6 × 0.2 cm, usually extrorsely twisted at apex; spathe c. 3.5 × 1.5 cm, convolute, longer than spadix, cuspidate, yellowish, apex acuminate; spadix 1.5 – 2 cm × 6 – 7 mm, cylindrical, apex rounded, cream, stipitate; stipe 0.3 – 0.6 cm × 1.4 – 1.7 mm, subcylindrical to weakly quadrangular. *Flowers*: stamens c. 1.5 × 0.75 mm; *gynoeceum*: c. 2.5 × 2.5 mm, prismatic, apex 2.5 – 3.5 mm wide, locules 2 per ovary; ovules 2 per locule, 1 – 1.5 mm long, anatropous, subsessile, usually one smaller than the other; placentation sub-basal; stigma discoid. *Infructescence*: c. 5.5 cm × 3.3 mm; berry 0.6 – 1 cm × 5 – 8 mm, bright orange; seed, 0.6 – 1 cm × 6 × 7.5 mm, obovoid, pulp orange, testa subrugose. Fig. 2.

**DISTRIBUTION.** Western Amazonia, Brazil (Acre, Amazonas), Peru (Loreto) (Map 1).

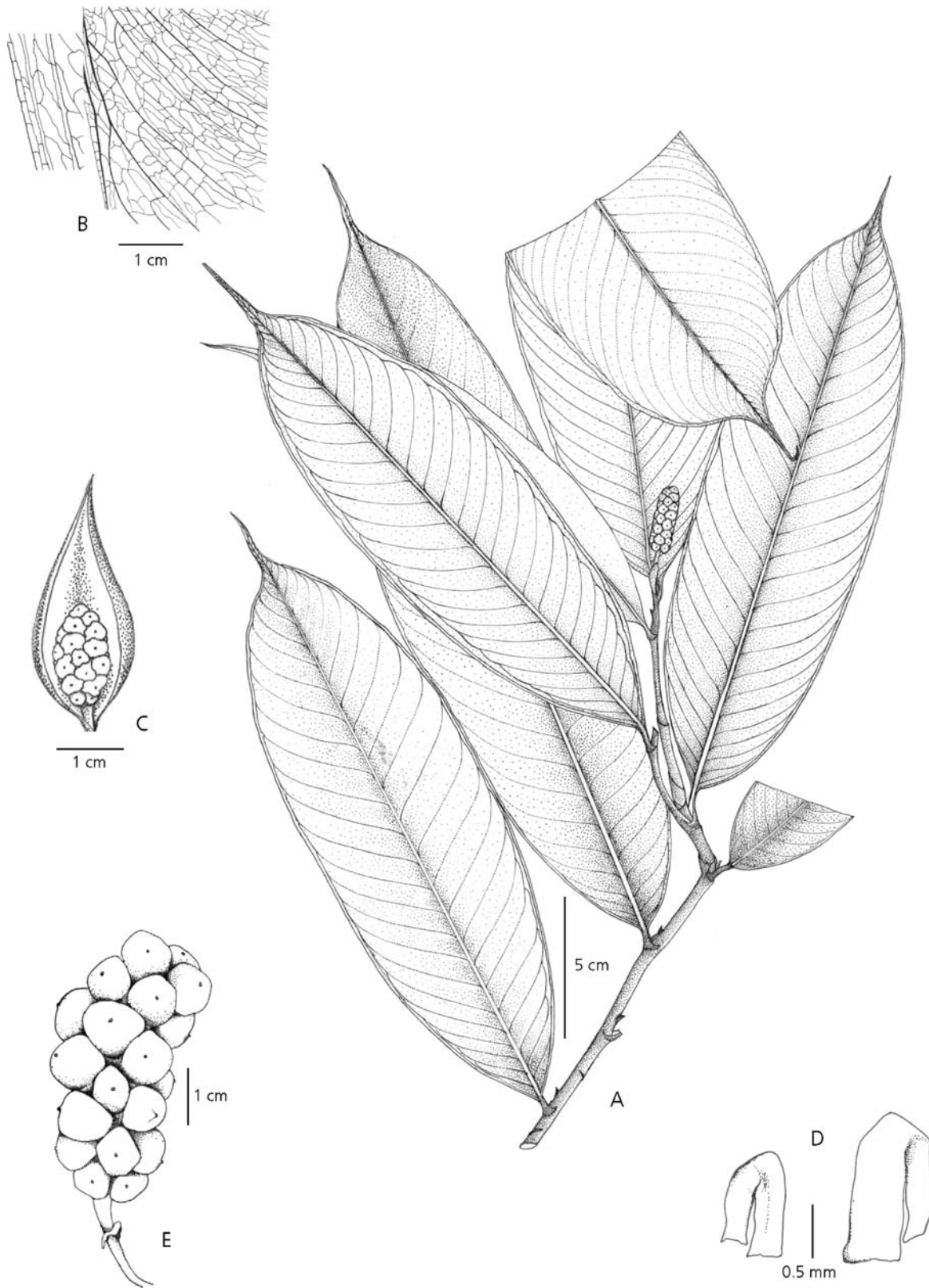
**SPECIMENS EXAMINED.** BRAZIL. Acre: Cruzeiro do Sul, Rio Moa 7°38'S, 73°36'W, 21 Aug. 1986, *T. B. Croat & A. Jr. Rosas* 62424 (INPA, MO, K fl.); Amazonas: Município de Coari, Rio Urucu, base da PETROBRÁS, 28 May 1991, *C. A. A. Freitas & C. D. A. Mota* 394 (INPA fr.); Município de Maraã, Rio Japurá, Lago Maraã 1°51'S, 65°36'W, 4 – 5 Dec. 1982, *T. Plouman et al.* 12189 (INPA, MO fl. fr.); Colonia dos Índios Canamaris,

Rio Japurá, 1°50'S, 65°35'W, 31 Oct. 1982, *C. A. Cid & J. Lima* 3443 (INPA fl.). PERU. Loreto: Provincia de Maynas, 3°50'S, 73°30'W, 23 Feb. 1981, *A. Gentry et al.* 31560 (MO fr.); 16 Aug. 1988, *S. McDaniel* 30195 (MO sterile); Distrito Las Amazonas; Comunidad Piloto "Roca Eterna" 3°25'S, 72°33'W, 27 March 1991, *C. Grández et al.* 2304 (MO fr.); Puerto Almendraz, Rio Nanay, 13 Jan. 1976, *A. Gentry & J. Revilla* 15878 (MO fr.); 20 km WSW of Iquitos 3°46'S, 73°20'W, 30 March 1989 *J. Chota* 14 (MO sterile); 93°48'S, 73°35'W, 9 Jan. 1986, *R. Vásquez & N. Jaramillo* 7080 (MO fr.). Santa Maria de Nanay and Iquitos, 23 Feb. 1981, *A. Gentry et al.* 31560 (MO fr.); 3°55'S, 73°35'W, 30 Sept. 1990, *J. J. Pipoly et al.* 12616 (MO fl.); Rio Nanay 3°40'S, 73°30'W, 6 July 1984, *R. Vásquez & N. Jaramillo* 5214 (MO fl.); 3°55'S, 73°35'W, 25 Sept. 1986, *R. Vásquez & N. Jaramillo* 7980 (MO fr.); Rio Yavari 14 April 1964, *J. V. Schunke* 6391 (MO fr.).

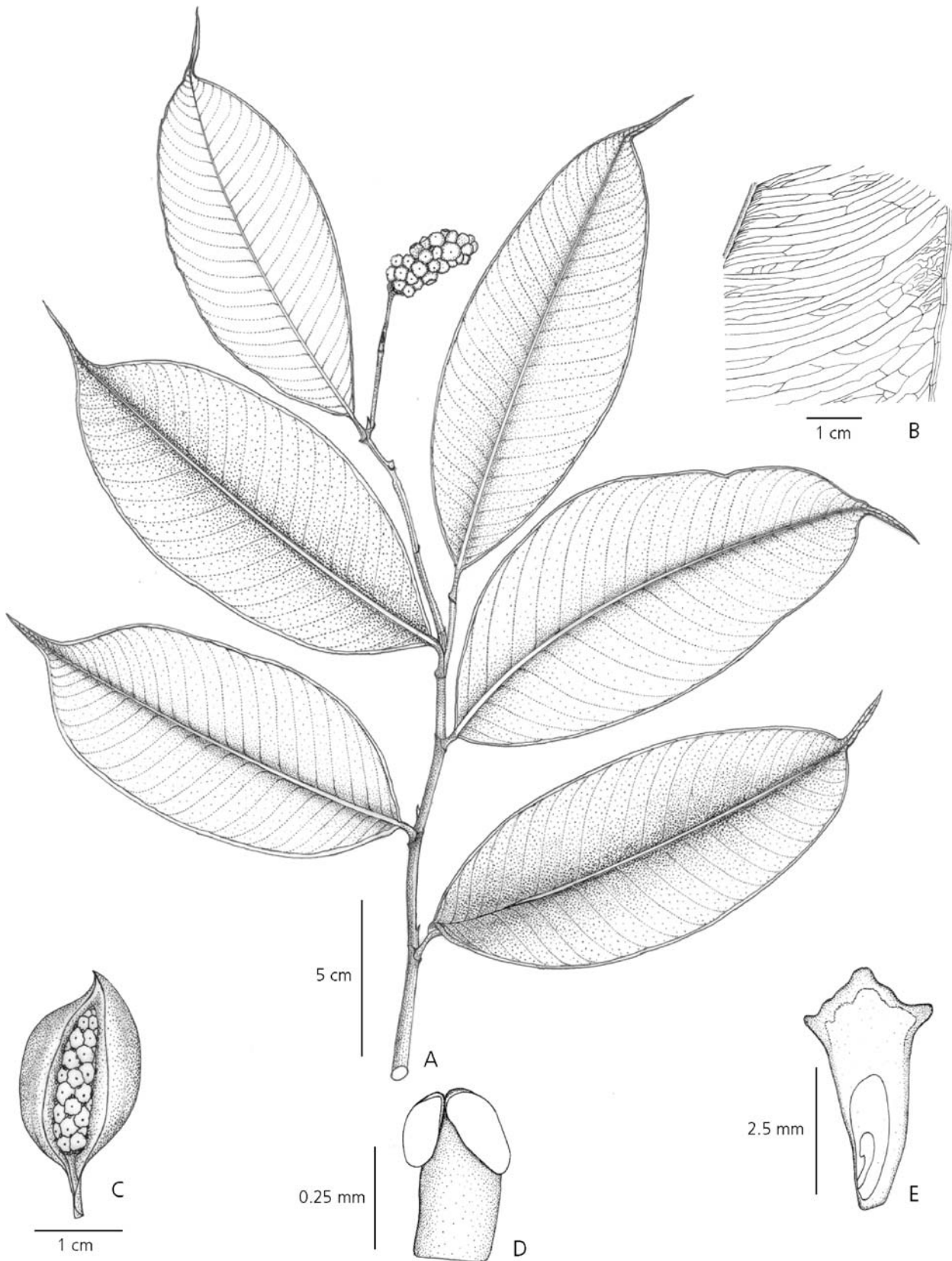
**HABITAT.** Occurring in Plateau Forest (terra firme); 120 – 230 m. Collected in flower in April, May, August to October, and in fruit from January to May.

**CONSERVATION STATUS.** Least Concern (LC). This species occurs over a wide area of lowland western Amazonian Brazil and Peru, and is probably not at immediate risk from habitat loss. However, as all species of *Heteropsis* are targeted as a non-timber forest product for their root fibres, there is a degree of threat.

**ETYMOLOGY.** The specific epithet honours Dr Thomas B. Croat of the Missouri Botanical Garden who has made numerous important contributions to knowledge of *Araceae* systematics, particularly through his unrivalled collections and extensive publications.



**Fig. 2.** *Heteropsis croatii*. A habit; B leaf venation, two details; C inflorescence; D ovules, lateral view; E infructescence. A – D from T. B. Croat 62424; E from A. Gentry & J. Reville 15878. DRAWN BY FELIPE FRANÇA MORAIS (A, B, C) AND ISABEL REIS (D, E).



**Fig. 3.** *Heteropsis robusta*. A habit; B leaf venation, detail; C inflorescence; D stamen, anterior view; E gynoecium, in L.S. A & B from G. A. Romero *et al.* 1832, C from R. L. Liesner 7361, D & E from G. Davidse *et al.* 27115. DRAWN BY FELIPE FRANÇA MORAIS.

**NOTES.** *Heteropsis croatii* is morphologically similar to *H. robusta* in the quadrangular internodes, oblanceolate leaf blade and inflorescence size, but differs by the midrib which is not yellowish on the lower surface in dried material, the adaxially impressed primary lateral veins, the thicker floral shoot axis, and especially by the short, usually extrorsely twisted peduncle and cuspidate spathe much longer than the spadix. In *H. robusta* the midrib is yellowish on the abaxial surface of the leaf blade, the floral shoot axis is slender, the peduncle is not extrorsely twisted and the spathe is not cuspidate and only slightly longer than the spadix.

***Heteropsis robusta* (G. S. Bunting) M. L. Soares comb. et stat. nov.**

*Heteropsis spruceana* var. *robusta* G. S. Bunting, *Phytologia* 60: 303 (1986). Type: Venezuela: Territorio Federal Amazonas, 90 – 110 m, 4 Aug. 1980, *Francisco Guanchez* 61 (holotype MYF, not seen).

*Plant* scandent, branches slender, aerial roots 3 – 6 mm diam., greyish; internodes 2 – 5 cm × 2.6 – 4 mm, longitudinally striate when dried, quadrangular, yellowish; lateral buds 1 – 1.5 mm long, straight, apex sharply pointed. *Leaf*: petiole 3 – 7 × 1.2 – 2 mm, margin slightly sinuate; geniculum 2 – 4 mm long; leaf blade 10 – 24 × 4 – 8 cm, ovate-lanceolate, dark green when fresh on both surfaces, dark green to pale brown when dried, matt, membranaceous, 1.3 – 2.6 mm thick, apex 1 – 3 cm long, caudate, base obtuse to shortly attenuate, margin slightly sinuate, midrib sulcate on upper surface, prominent, yellowish on lower surface, primary and secondary lateral veins arched in the direction of the apex, more easily seen on lower surface, submarginal collective vein 2 – 3 mm from the margin, with an outer submarginal vein. *Inflorescence*: terminal and axillary, floral shoot 3 – 6.5 cm long, slender, internodes 1 – 2.5 cm × 1.3 – 1.7 mm, yellowish when dry, slightly quadrangular; peduncle c. 0.1 cm long; spathe 2 – 2.5 × c. 2 cm, (closed spathe 2 × 0.7 – 0.9 cm) yellow on both surfaces, inflated, convolute, apex acuminate; spadix 1.5 – 2.5 × 0.6 – 1 cm, cylindric, yellowish-white, apex rounded to acuminate,

stipitate; stipe 2 – 3 × 1.1 – 1.6 mm. *Flowers*: stamens c. 0.8 mm long, 0.7 mm wide; *gynoecium*: c. 1.25 × 0.8 mm, prismatic; locules 1 – 2 per ovary; ovules 1 – 2 per locule, anatropous; placentation sub-basal; stigma discoid to subdiscoid. *Infructescence*: 3 – 5.5 cm × 2 – 3.5 mm; berry obovoid, orange, 0.8 – 1.3 cm × 5 – 9 mm, apex 2 – 4 mm diam.; seed 0.6 – 0.9 × 0.4 – 0.6 cm, subobovoid. Fig. 3.

**DISTRIBUTION.** Brazil, Colombia, Ecuador, Peru and Venezuela (Map 1).

**SPECIMENS EXAMINED.** **BRAZIL.** Acre: Cruzeiro do Sul, Aeroporto, 29 Feb. 1976, *J. Ramos & G. Mota* 195 (INPA fr.); 22 April 1971, *G. T. Prance et al.* 12220 (U, INPA fr.); 7 Feb. 1976, *O. P. Monteiro & C. Damião* 159 (INPA, MO fr.); 13 Feb. 1976, *O. P. Monteiro & C. Damião* 349 (INPA fr.); Sena Madureira: Bacia do Rio Purus, 8°27'S, 71°21'W, 20 Sept. 1994, *D. C. Daly et al.* 8279 (MO fl.); Amazonas: Novo Aripuanã, 21 April 1985, *C. A. Cid et al.* 5684 (INPA fr.); Serra do Aracá, 0°48'N, 63°18'W, 27 Feb. 1984, *J. Pipoly et al.* 6711 (INPA fr.); Rio Negro, 6 May 1971, *M. F. Silva et al.* 1278 (INPA fr.); Santa Isabel do Rio Negro, 2 Sept. 2003, *M. L. Soares & I. L. Amaral* 530 (INPA fr.); Pará: Altamira, 18 Aug. 1978, *R. P. Bahia* 78 (MG fl., fr.); Carajás, 7 June 1982, *C. R. Sperling et al.* 5965 (MG fl.); Porto Trombetas, 15 Oct. 1987, *O. H. Knowles* s.n. (INPA 154829 fl.); Presidente Medici, 4°00'S, 55°04'W, 7 Feb. 1976, s.c. (MO 3474604, fl.); Roraima: *G. T. Prance et al.* 10660 (K sterile). **COLOMBIA.** Caquetá: Araracuara, 0°34'S, 72°08'W, 22 April 1989, *C. Londono et al.* 270 (MO sterile); 0°37'S, 72°24'W, 10 Dec. 1991, *J. Duijvenvoorden et al.* 2683 (MO sterile); Chocó: 17 Jan. 1979, *A. Gentry & E. Renteria* 24281 (MO sterile); Vaupés: 29 Aug. 1976, *J. Zarucchi* 1923 (INPA fr.). **ECUADOR.** Corentyne, 14 April 1990, *T. McDowell & D. Gopaul* 22 (U fr.). Gonzalo Pizarro, 19 May 2002, *C. Morales et al.* 801 (MO fr.); Napo: 0°27'S, 77°01'E, 6 April 1986, *M. Backer et al.* 6889 (MO fr.); Guiana Takutu, 1 May 1992, *T. Pennington & I. Jonson* 437 (K fr.); Pastaza: 40 km ao Oriente de Montalvo, 00°44'S, 76°52'W, 26 – 30 April 1990, *E. Gudiño* 252 (MO fr.); Carretera de PETRO-CANADA, Via Auca, 115 km al sur de Coca, 01°15'S, 76°55'W, 22 – 28 Feb.

**Table 1.** Characters distinguishing *Heteropsis robusta* and *H. spruceana*.

Character	<i>Heteropsis robusta</i>	<i>Heteropsis spruceana</i>
Petiole length	0.3 – 0.7 cm long, not twisted	Petiole subsessile, twisted
Petiole margin	Slightly sinuate	Smooth
Leaf blade size (cm)	10 – 24 × 4 – 8	9 – 14.7 × 3 – 4.7
Leaf blade shape	Ovate-lanceolate, apex caudate, base obtuse to shortly attenuate	Ovate-elliptic, strongly attenuate apex, cuneate to rounded base
Leaf blade surface texture	Matt	Glossy and usually covered with bryophytes
Spadix size (cm)	1.5 – 2.5 × 0.6 – 1	2 – 2.8 × c. 0.5
Mature berry colour	Orange	Yellowish-orange

1989, *Vlastimil Zak* 4035 (MO fl.); Rio Curaray, 29 Aug. 1985, *W. Palacios & D. Neill* 737 (MO fr.). **PERU.** 23 Nov. 1964, *C. H. Dodson & J. Torres* 2973 (MO sterile); Amazonas: 11 March 1973, *R. Kayap* 560 (MO fl.); Vale do Rio Santiago, 3°50'S, 77°40'W, 6 March 1980, *S. Tunqui et al.* 1008 (MO fr.); Imaza: 04°55'S, 78°19'W, 15 June 1996, *E. R. Rodriguez & P. Atamain* 1056 (MO fr.); Loreto: Provincia de Maynas, Rio Nanay, 28 June 1982, *A. Gentry & J. Revilla* 15878 (K fr.); 23 Feb. 1986, *A. Gentry et al.* 31560 (K fr.); 3°50'S, 73°30'W, 25 Feb. 1981, *A. Gentry et al.* 31743 (MO fr.); 3°50'S, 73°30'W, 19 April 1982, *A. Gentry et al.* 36483 (MO fr.); 26 March 1979, *F. Ayala* 1704 (MO fr.); 4°29'S, 73°35'W, 23 Nov. 1990, *G. Grandez & J. Ruiz* 2119 (MO sterile); Iquitos: 12 May 1976, *M. Y. Rimachi* 2241 (MO fr.); Requena, Sapuena, Jenaro Herrera 4°50'S, 73°45'W, 14 Sept. 1987, *R. Vasquez & N. Jaramillo* 9584 (MO fr.); Madre de Dios: 41 km do Porto Maldonado, 24 April 1977, *A. Gentry et al.* 19736 (MO fr.); Pasco: Provincia Oxapampa, 10°11'S, 75°13'W, 1 Dec 1982, *D. Smith* 2864 (MO fr.); 10°20'S, 75°15'W, 12 May 2003, *L. Langan et al.* 495 (MO sterile); Pichinaki: 28 June 1982, *A. Gentry et al.* 37245 (MO fr.); San Martins Mariscal Caceres: 26 May 1982, *J. Schunke-V.* 13653 (MO fr.). **VENEZUELA.** Atabapo: 3°40'N, 67°13'W, 3 May 1979, *G. Davidse et al.* 27115 (MO fl.); 04°30'N, 65°48'W, Oct. 1989, *L. Delgado* 760 (MO fr.); Atures: Santa Rosa de Ucata, 4°24'N, 67°48'W – 4°24'N 67°46'W, 19 April 1989, *G. A. Romero et al.* 1832 (MO fr.); 4°20'25"N, 67°44'12"W, 20 June 1992, *P. E. Berry et al.* 5157 (MO sterile); Bolivar: Municipio Cedeño, Nov. 1995, *C. Knab-Vispo* 220 (MO fr.); 06°35'N, 64°45'W, 20 April 1996, *C. Knab-Vispo & G. Rodriguez* 537 (MO sterile); 06°35'N, 64°45'W, 25 June 1996, *C. Knab-Vispo & G. Rodriguez* 579 (MO fl.); 4 July 1984, *G. Davidse & J. S. Miller* 26976 (MO fl.); 4°30'N, 61°40'W, 5 Nov. 1985, *R. Liesner* 19563 (K, MO fr.); 05°19'N, 61°03'W, 27 April 1988, *R. Liesner* 23908 (MO sterile); 4°23'N, 61°38'W, 21 Oct. 1985, *R. Liesner et al.* 18888 (MO fr.); Distrito Heres, 3°N, 62°W, 14 Feb. 1981, *J. A. Steyermark et al.* 124288 (MO fl.); Rio Negro: 0°50'N, 66°10'W, 4 – 5 July 1984, *G. Davidse & J. S. Miller* 26976 (MO fr.); San Carlos de Rio Negro, 1°56'N, 67°03'W, 7 April 1981, *K. E. Clark & S. Ribeiro* s.n. (MO 2995016 fl.); 1°56'N, 67°03'W, 12 May 1979, *R. Liesner* 7361 (MO fl., fr.); 01°54'N, 65°55'W, 13 Oct. 1987, *R. Liesner & F. Delascio* 21899 (MO fr.); Caño Moriche 5°30'N, 66°35'W, 27 April 1986, *Stanford Zent* 286 (MO sterile).

**HABITAT.** Moist evergreen tropical forest; fertile material of *Heteropsis robusta* was collected between 1.5 – 20 m above ground level; 110 – 1000 m. Collected in flower from February to August, and in fruit from April to December.

**CONSERVATION STATUS.** Least Concern (LC). This is a very widespread species in north-western and north-central South America, and is unlikely to be at

immediate risk. However, as all species of *Heteropsis* are targeted as a non-timber forest product for their root fibres, there is a degree of future threat.

**VERNACULAR NAMES.** Titiquinha (Manaus, Amazonas, Brazil); Memidi, Minñato, Mamure (Venezuela); Ninguno (Colombia).

**NOTES.** *Heteropsis spruceana* var. *robusta* was first described by G. S. Bunting (1986), who distinguished it from *H. spruceana* var. *spruceana* only in having larger and relatively broader leaf blades. We justify raising *H. robusta* to species rank on the following grounds: i) our examination of herbarium specimens has added some other characters (Table 1) to reinforce the distinction; ii) morphological distinctions between the species of *Heteropsis* are generally small and dependent to a significant extent on leaf shape differences.

### Acknowledgements

The authors are grateful to the curators of the following herbaria, who made specimens available for study: INPA, K, MG, MO, U, and also to the artists Felipe França Morais and Isabel Reis for the illustrations. This research was carried out as part of the Doctoral Thesis in Botany of M. L. Soares, at the Instituto Nacional de Pesquisas da Amazônia (INPA), Manaus, Brazil.

### References

- Bunting, G. S. (1986). New taxa of Venezuelan Araceae. *Phytologia* 60: 293 – 344.
- Durigan, C. C. (1998). *Biologia e extrativismo do cipó-titica (Heteropsis spp. – Araceae). Estudo para avaliação dos impactos da coleta sobre a vegetação de terra-firme no Parque Nacional do Jaú, Amazonas.* Dissertação de Mestrado. Instituto Nacional de Pesquisas da Amazônia/Universidade do Amazonas, Manaus.
- Galvão, E. (1959). Aculturação indígena no rio Negro. *Bol. Mus. Paraense Emílio Goeldi, n.s., Bot.* 7: 1 – 78.
- Govaerts, R., Bogner, J., Boos, J., Boyce, P., Cosgriff, B., Croat, T., Goncalves, E., Grayum, M., Hay, A., Hetterscheid, W., Ittenbach, S., Landolt, E., Mayo, S., Murata, J., Nguyen, V. D., Sakuragui, C. M., Singh, Y., Thompson, S. & Zhu, G. (2007). *World Checklist of Araceae.* Royal Botanic Gardens, Kew. Published on the Internet; <http://www.kew.org/wcsp/monocots/> accessed 10 Jan. 2007.
- Mayo, S. J., Bogner, J. & Boyce, P. C. (1997). *The Genera of Araceae.* Royal Botanic Gardens, Kew.
- Milliken, W., Miller, R. P., Pollard, S. R. & Wandelli, E. V. (1992). *The ethnobotany of the Waimiri Atoari Indians.* Royal Botanic Gardens, Kew.
- Potiguara, R. C. V. & Nascimento, M. E. (1994). Contribuição á anatomia dos órgãos vegetativos de *Heteropsis jenmanii* Oliv. (Araceae). *Bol. Mus. Paraense Emílio Goeldi, n.s., Bot.* 10 (2): 237 – 247.