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Qualea Aubl. from Paraná State, Brazil

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ABSTRACT. The results from a survey on Qualea Aubl. (Vochysiaceae A. St.-Hil.) in the State of Paraná are presented. The analysis was based on dried material from several regional herbaria as well as fresh material collected in different regions of the State. Four species were registered: *Q. cordata* Spreng.; *Q. glaziovii* Warm; *Q. grandiflora* Mart.; *Q. multiflora* Mart. spp. *multiflora*. A key to differentiate the species is presented and for each species, the botanical description, common names, phenology data, the geographic distribution, uses and illustrations are included.

Keywords: cerrado, floristic survey.

RESUMO. *Qualea* Aubl. (Vochysiaceae) no Estado do Paraná, Brasil. Apresentam-se resultados de levantamento das espécies de *Qualea* Aubl. (Vochysiaceae A. St.-Hil.) no Estado do Paraná, baseado em material depositado em herbários regionais e em material coletado em diversas regiões deste Estado. Foram registradas quatro espécies: Q. *cordata* Spreng.; Q. *glaziovii* Warm; Q. *grandiflora* Mart.; Q. *multiflora* Mart. spp. *multiflora*. Incluem-se chave dicotômica para identificação, assim como descrições, nomes populares, usos, fenologia, distribuição geográfica e ilustrações, para cada espécie identificada.

Palavras-chave: cerrado, florística.

Introduction

Belonging to Vochysiaceae A. St.-Hil., *Qualea* Aubl. is a neotropical genus with approximately 60 species, restricted to the Central and South Americas, occurring in rain forests as well as in Cerrados (savannas) (LISBOA, 2000). The name *Qualea* is derived from *qualé*, the original name used to designate these plants by the Guianas native aborigines (VIANNA; MARTINS, 2001). Popularly known as dedaleira, pau-terra, laba-laba, umirirana and muiraúba-da-várzea, among other names, some species of this genus provide wood for the construction of boats, boxes and houses interior (RECORD; MELL, 1924) as well as are used in folk medicine against stomach ulcer, diarrhea and intestinal colic (GRANDI et al., 1989).

Regarding the occurrence of this genus at Paraná State, there is some discrepancy in the literature data. According to Stafleu (1953), this genus would be represented at Paraná by *Q. cordate* Spreng. var. *cordate; Q. grandiflora* Mart. and *Q. multiflora* Mart. spp. *multiflora*. Angely (1965), beside these, included *Q. cryptantha* (Spreng.) Warm. and *Q. intermedia* Warm.. However, this last taxon was previously included in *Q. cordate* Spreng. as var. *intermedia* (Warm.) Stafleu (1953), without inserting Paraná State in its distribution area. Vianna e Martins (2001) registered the occurrence of *Q. cordate* Spreng. var. *cordate* and *Q. cryptantha* (Spreng.) Warm. var. *cryptantha* at Paraná State. Negrelle (1988), besides these, reinforced the occurrence of *Q. grandiflora* Mart. and *Q. multiflora* Mart. ssp. *multiflora* in the State.

Facing such divergence of information and aiming to update the Qualea Aubl. distribution knowledge, the results from a study on the genus occurrence at Paraná State, Southern Brazil are presented. The research was performed in accordance with the Global Strategy for Plant Conservation (ESTRATÉGIA, 2006), which points out the necessity of a continuous updating process of floristic surveys, monitoring biodiversity distribution at country level and respective states.

Material and methods

The following regional herbaria were consulted aiming to obtain records of *Qualea* occurrence at Paraná: FUEL (Londrina, PR), HBR (Itajaí, SC), HCF (Campo Mourão, PR), HUCO (Irati, PR), HUEM (Maringá, PR); HUPG (Ponta Grossa, PR), MBM (Curitiba, PR), PKDC (Curitiba, PR), UPCB (Curitiba, PR), UNOP (Cascavel, PR). Additionally, exploratory field trips were performed in distinct periods in several locations classified by Straube (1998) as savanna (Cerrado) at

Paraná State, as follows: Vale do Rio das Cinzas, Norte Velho, Norte Novo and Campo Mourão. In these opportunities, the local occurrence of *Qualea* was registered as well as plant material was collected. The collected material after properly dried and identified was incorporated to the UPCB Herbarium at the Department of Botany / Federal University of Paraná State (UFPR). The species identification followed the classic taxonomy standards, analyzing the morphological characteristics of several species representatives. The determination at specific level was performed based on Warming (1875), Stafleu (1953) and Lisboa (2000) analytic keys. Based on all registered and examined plant material, a key to determining the *Qualea* species occurring in Paraná State was elaborated. For each indentified species, the botanical description, common names, phenology data, the geographic distribution, uses and illustrations are included. The genus description was based on Stafleu (1953).

Qualea Aubl. Pl.Gui. 1:5.1775.

Espécie typus: *Q. rosea* Aubl.

Trees or shrubs. Stipules usually represented by crater shaped glands or extrafloral nectaries. Perulate leaf buds. Opposite leaves, rare 3-verticillate; simple, coriaceous or rigid-chartaceous; venation camptodromous-brochidodromous or mix craspedodromous. Petiole, most of all, wrinkled and canaliculated in the adaxial face. Inflorescence thyrsoidea, terminal or axial, usually formed by isolated flowers mixed with pauciflorus cincinnus, which sometimes are sessile; deciduous bracts. Asymmetrical elongated-oval flower buds, calcarate or not. Calix with unequal lobes, the bigger one generally calcarate and with a gibbous base, the others varying in size but always smaller. Corolla with a single petal usually obcordate, located between the two biggest calyx lobes, color varying among white, yellow, blue-purple or rose; purple or yellow spotted at the centre. Androecium represented by only one stamen, with basifixed to sub-dorsifixed anther, glabrous, large filament, rostrate connective. Staminodes (2), usually present, small and foliaceous. Gynoecium with superior ovary, densely pilose, trilocular; biseriate Seminal rudiments up to 12 per cavity; axile placentation, thin placentae; style simple, large and filiform; stigma simple, usually terminal, sub-capitate. Fruit, elliptical-elongated capsule, loculicidall, thin central collum, woody pericarp. Winged oblong seeds. Homotropous embryo, straight, with convolute and plicate cotyledons.

Results and discussion

Four species of *Qualea* were registered at Paraná State, included in two sub-genus, according to the Stafleu (1953) classification, as discriminate as follows:

Sub-genus	*Amphilochia* (Mart.) Stafl.	
		Q. cordata Sprengel
		Q. glaziovii Warm.
Sub-genus	*Qualea*	
	Sec. *Costatifolium* Stafl.	
		Q. grandiflora Mart.
		Q. multiflora Mart. ssp. *multiflora*

Among the previously species cited for Paraná State, it was excluded *Q. cryptantha* (Spreng.) Warm., whose occurrence is restricted to the Tabuleiro Forest in the NE – region of Brazil, as reported by Lisboa (2000). The majority of the plant material previously collected at Paraná and identified as this species, in fact correspond to *Q. glaziovii* Warm.

Considering all the species registered for the State, only *Q. glaziovii* was detected exclusively in a region characterized by an interface between Ombrophyllous Dense Forest and Araucarian Forest, where the climate is subtropical wet (Mesothermic - Cfb), with average temperature at the hottest month inferior to 22°C and at the coldest month inferior to 18ºC, without dry season, with pleasant summer and frequent heavy frosts at winter (IAPAR, 2000).

The other species were registered in Cerrado (savanna) and surroundings areas, characterized by subtropical wet climate (Mesothermic- Cfa), with average temperature at the hottest month superior to 22ºC and at the coldest month inferior to a 18ºC, without dry season, with hot summer and less frequent frosts at winter (IAPAR, 2000). Q. *cordate* had the wider register of occurrence, being distributed at the northwest, north and northeast regions of the State. *Q. grandiflora* and *Q. multiflora* spp. *multiflora* were registered only in few areas with Cerrado at the north and northeast regions (Figure 1).

According to Straube (1998), Paraná State encompasses four macro-geographic regions covered by Cerrados, as follows: Vale do Rio das Cinzas (Cinzas River Valey), Norte Velho (Old North), Norte Novo (New North) and Campo Mourão, with distinct level of degradation and fragility.

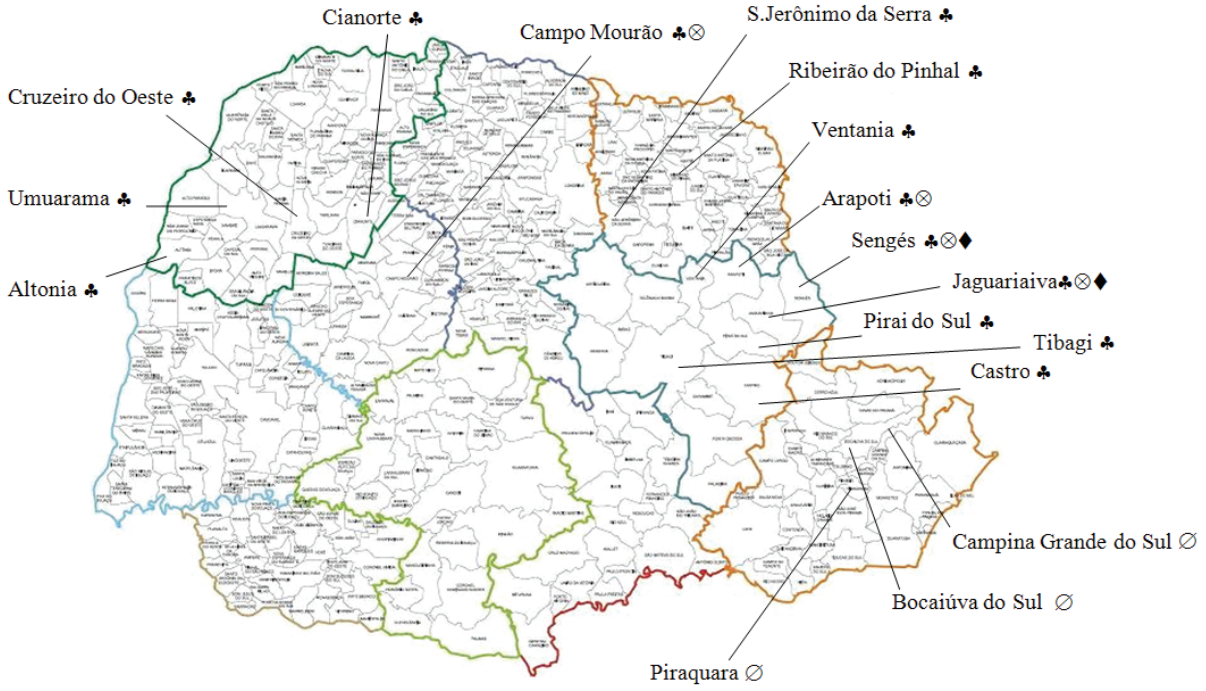

Figure 1. Distribuition of *Qualea* species at Paraná State, being: ♣ = *Q. cordate* Spreng.; ∅ = *Q. glaziovii* Warm.; ⊗ = *Q. grandiflora* Mart. and ♦ = *Q. multiflora* Mart. ssp. *multiflora*.

Located at the northeast region of the Paraná State, the macro-geographic region named Vale do Rio das Cinzas includes the biggest and most significant Cerrado area of the State. There, this type of vegetation has being evolved from open grassland, at 730 up to 1,100 m above the sea level, mixing in some points with the Araucarian Forest. It is distributed through the municipalities of Jaguariaíva, Arapoti, Piraí do Sul, Sengés, Telêmaco Borba and Tibagi. In that region, that encompasses the Cerrado State Park (1830.40 ha) and the Guartela State Park (798.97 ha, where 5 ha correspond to Cerrado), it was evidenced the greatest diversity of Qualea species, including *Q. cordate, Q. grandiflora* and *Q. multiflora* var. *multiflora.* The last one observed exclusively in this region.

The called Cerrados from the Norte Velho correspond to the region historically reported as covered by Cerrado only in some disperse areas between the Municipalities of São Jerônimo da Serra, Conselheiro Mairinck and Ribeirão do Pinhal, all them at the right side of Tibagi river. At present, those Cerrado areas are extremely reduced, due to anthropogenic occupation and agro-forestry activities. Only *Q. cordate* was registered *in* this region.

The Cerrados from Norte Novo include little more than 40 km^2, surrounded by Semideciduous Seasonal Forest, in a region between Bandeirantes and Pirapó rivers, near to Maringá city. No *Qualea* species was detected in that region.

The Cerrados from Campo Mourão, located at the centre-northwest of the State, originally covered approximately 102 km^2, being classified as a transition between the Semideciduous Seasonal Forest and the Araucarian Forest, with predominance of the last one. At present, the remaining area corresponds up to 0.7% of the original Cerrado area, due to the urban and rural development of Campo Mourão Municipality. The most expressive fragments correspond to the Cerrado Ecological Station (1.3 ha) and Plot 7-H. This last one, located at the side of the Highway BR-158, is the best Cerrado representative in that region (MIZOTE, 2005). In these areas, we registered the occurrence of *Q. cordate* and *Q. grandiflora*.

In general, there is insufficient information about abundance or density of individuals of *Qualea* species in the distinct locations at Paraná State. Especially due to the small size of tree-shrub representatives, these are not usually included in the quantitative vegetation surveys. According to Isernhagen et al. (2002), only two quali-quantitative plant surveys at Paraná State registered the occurrence of *Qualea* species: Uhlmann (1995) and Uhlmann et al. *(*1998). At the last one, only two individuals of *Q. cordate* were identified among 549 other tree individuals (perimeter at trunk base > 15) sampled area equal 4,000 m^2 at Cerrado State Park.

Evaluating the distribution of the four *Qualea* species in a national range, it is possible to identify that the Paraná State represents the southern limit for *Q. grandiflora* and *Q. multiflora* (around 24º lat. S). For *Q. cordate*, this limit corresponds to the north of Santa Catarina State (around 26º lat. S), with only one record for the species in that State. For *Q. glaziovii* this limit corresponds to the coastal zone of Santa Catarina State, near to Florianópolis city (around 27º lat. S). The northern limit of these four species is much broader, especially for *Q. grandiflora*, with occurrence in almost all national territory, with exception to the northeast region.

Key for determination of *Qualea* Aubl. species at Paraná State

1 Calcar absent or very small.....2
1' Calcar well developed.....3
2 Base of the foliar blade usually acute-cuneate, very preeminent urceolate petiole gland .....*Q. glaziovii* Warm.
2' Base of the foliar blade cordate, usually inconspicuous circular flat peciole gland .....*Q. cordata* Spreng.
3 Floral bud with external spur .....*Q. multiflora* Mart. ssp. *multiflora*
3' Floral bud with internal spur .....*Q. grandiflora* Mart.

Qualea cordata Spreng. Syst.1:17.1825 (Figure 2-A).

Tree or treelet (0.5-)1.80-6.0(-10) m high, tortuous trunk, glabrous branches, slightly 4angled, sometimes exfoliated; older branches usually lenticelated, axiale perulate buds, inconspicuous circular glands (0.05 cm diam.), sometimes with a small gland appendix just above the main gland. Petiole glabrous, blackish, slightly canaliculated, (0.15-) 0.5-0.8 (-1.5) cm long. Opposite decussate leaves; glauco-pruinose, specially in the adaxial face, varying in size and shape; ovate blade (or ovate-lanceolate, ovate-elliptic, ovate-oblong, elliptic-oblong, (4-) 5.5-9 (-12) cm long and (2.5-) 3.5-5 (-7) cm wide, coriaceous; Acute or obtuse apex (sometimes acuminate); cordate base; margin entire, fimbriate; venation mix craspedodromous, inconspicuous at the adaxial face. Inflorescence thyrsoid, 10(-15) cm long and 2 cm wide; cincinnus (1-)2-4 flower, pubescent pedicel 0.2-0.4 cm long. Ovate-elliptic buds (0.6-)0.8-1.0(-1.2) cm long and (0.2-)0.5(-0.7) cm wide, non calcarate. Calyx with unequal lobes; the lateral ones almost glabrous, others are sericeous at the dorsal face; 4º lobe with gibbous base. Whitish petals spotted at the centre, heavily sericeous, 1.5-1.8 cm wide, emarginated apex; membranaceous, with a crass base. Glabrous anthers, obcordate, dorsifixed (versatile), 0.3-0.5 cm long; slightly rostrate connective; filament glabrous or slightly pilose at the base, usually narrowing towards the anther, 0.6-0.8 cm long. Staminodes absent. Heavily albescent-pilose, trilocular ovary with 10-12 seminal rudiments per cavity; glabrous style 0.5-0.7 cm long; capitate-papillose stigma. Fruit with woody oblong-elliptic capsule, loculicidal, 2-2.5 cm long; exocarp finely verruculose and densely fissured (at fruit senescence, the exocarp is represented only by its venation net attached to the peduncle), elliptic elongated valves, acuminate; peduncle 0.6-1.0 cm long and 0.3-0.5 cm wide

Common names: pau-terra (PR, SC), mariano (MG), dedaleira-preta (SC), burro-caá, quebracho-falso (Paraguai).

Uses: supplies wood for canoes, crates and carpentry. The bark and fruits are source of tinctorial material (CORRÊA, 1984). Without usage indication at Paraná State.

Phenology: Flowering (May) August-January. Fructification (November) December-May (April).

Geographic distribution: Brasil: MG, MT, RJ, SP, PR and SC. North and center of Paraguay.

Distribution at Paraná State: Mun. Tibagi, Castro and Piraí do Sul: grassland mixed with forest remnants and riparian forests at the *Araucaria* region. Mun. Sengés and Jaguariaíva: savanna (Cerrado) remnant inserted in the grassland region (700 up to 1100 m a.s.l.). Usually found on rocky soil. According to Linsingen et al. (2006), it was registered in the Cerrado *strictu sensu*s as well as at its border with the Seasonal Semideciduous Forest. Mun. Arapoti, Ventania, Ribeirão do Pinhal and S. Jerônimo da Serra: Seazonal Semideciduous Forest as well as the transition zone to savanna. Mun. Campo Mourão: Cerrado and Cerradão. Mun. Altônia, Cruzeiro do Oeste, Cianorte and Umuarama: Seazonal Semideciduous Forest fragments intercalated with pasture and agriculture fields.

Material examined: Brazil, **Paraná**, Mun. **Altônia**, Fda. Pontal II, 12/XI/2002, C. Kozera 1528 (MBM); Mun. **Arapoti**: Barra Rio das Perdizes, 27/XI/1959, G. Hatschbach 6587 (MBM); Fda. do Tigre, 28/XI/1959, G. Hatschbach 6607 (HBR, MBM). Mun. **Campo Mourão**, 22/V/2003, M.G. Caxambu 39 (HCF); 18/XI/2003, M.G. Caxambu 151 (HCF); 28/XI/2003, M.G. Caxambu 220 (HCF); 30/IV/1998, A. Soares and W. Maschio 235 (MBM); idem, 27/V/1996, A. Soares 82 (MBM). Mun. **Castro**: Carambeí, Rio S. João, 1/XI/1964, G. Hatschbach 11788 (MBM PKDC, UPCB). Mun. **Cianorte**, Fda. Lagoa, 20/V/1971, G. Hatschbach

26680 et. P. Pelanda (MBM). Mun. **Cruzeiro do Oeste**: Doradina, 29/X/1959, R. Braga and R. Lange 132 (UPCB 2718, PKDC 5488). Mun. **Jaguariaíva**, Lageado 5 Reis, 23/III/1968, G. Hatschbach 18939 (MBM), Fda. Chapadão S. Antônio, 26/XI/1968, G. Hatschbach 20392 (UPCB, MBM); 30/XI/1993, A.C. Cervi 4197 et al. (UPCB). PE do Cerrado, 14/XI/1992, A. C. Cervi 3836 and A. Dunaiski (MBM), 30/VII/1997, A. C. Cervi 6385 et al. (UPCB). Mun. **Piraí do Sul**, Fda. das Almas, 16/IV/1987, Y. S. Kunyoshi and C. V. Roderjan 5182 (MBM). Mun. **Ribeirão do Pinhal**, 16/XII/1998, J. Carneiro 628 (MBM). Mun. **São Jerônimo da Serra**, Reserva Indígena São Jerônimo, 17/IV/2002, K. L. V. R. de Sá - 110 (MBM); idem, 13/II/2003, K. L. V. R. de Sá et al. 505 (MBM, FUEL). Mun. **Sengés**: Fda. Morungava, Rio do Funil, 12/XII/1958, G. Hatschbach 5265 and R. B. Lange (MBM); Fda. Sta. Gil, 16/XII/1986, Negrelle et al. 153 (UPCB), idem, 16/XII/1986, Negrelle et al. 159 (UPCB), idem 17/XII/1986, Negrelle et al. 163 (UPCB). Mun. **Tibagi**, Guartelá, 23/XII/1992, A. C. Cervi 4002 (MBM); idem, 23/XII/1992, A. C. Cervi 4002 (UPCB); Cânion do Rio Iapó, 07/XI/1996, E. P. Santos et al. 212 (UPCB); Cânion Guartelá, 28/IV/1996, O. S. Ribas 1391 and L. B. S. Pereira (MBM); PE do Guartelá , 03/III/2003, M. R. B. do Carmo 129 (HUEPG); PE do Guartelá, 07/I/2003, M.R.B. 31 (HUEPG); PE do Guartelá, 30/V/2003, M. R. B. do Carmo 150 (HUEPG); PE do Guartelá, 05/12/2003, M. R. B. do Carmo 521 (HUEPG); PE do Guartelá, 29/X/2004, D. C. Maia and R. Morokawa s/n (UPCB);. Mun. **Umuarama**, Serra dos Dourados, IV/1958, R. Braga s/nº (MBM, UPCB, PKDC). Mun. **Ventania**, Morro do Chapéu, 2005, D. A. Estevan 772 (FUEL).

Qualea glaziovii Warm. Flora Bras. 13 (2): 53. 1875 (Figure 2-B)

Trees 10-25 m high; glabrous branches, usually with small scales at the base of young branches, old branches sometimes lenticelated, sub-globose perulate buds, perula with ciliate border, prominent urceolate glands at the petiole base (0.05-0.10 cm long and 0.08-0.10 cm diam.), thin blackish glabrous petiole (0.8-)1-1.5(-2) cm long and ca. 1 mm wide. Opposite decussate leaves, glabrous or with very short hairs sparsely distributed along the central vein; elliptic oblong-elliptic or ovate-elliptic, blade (4.8-)5-8 cm long and (2-)3(-5) cm wide; acute-acuminate or acute apex, base usually acute-cuneate, entire margin, venation mix–camptodromous; papiracea. Inflorescence thyrsoid 6-9 cm long and 2 cm wide; cincinnus 2-3(-5) flower, pedicel (0.15-) 0.2-0.3 (-0.5) cm long, slightly puberulent. Elliptic to ovate-elliptic buds 0.7-1.0 cm long; spur absent. Calyx with unequal sericeous lobes, the lateral ones are rounded and smaller; the fourth one is larger and with a gibbous base. Heavily sericeous petals, specially at the centre; (1-) 1.5 cm long and wide; white with purple veins at the base, undulate margin. Glabrous anther, rarely with sparse hairs; glabrous; dorsifixed; curved; 3 mm long; filament heavily pilose with 0.5-0.7 cm long, narrowing towards the anther. Staminodes absents. Tomentose ovary; style pilose at the base 0.5-0.8 cm long, capitate stigma. Fruit woody elliptic capsule with mucronate apex; finely verruculose and fissured exocarp; 2-2.5 cm long, peduncle ca. 0.5 cm long and 0.2-0.3 cm wide.

Common names: louro-da-serra, louro (PR, SC).

Uses: Without usage indication at Paraná State as well as other locations were the species occurs.

Phenology: Flowering October-February (-March). Fructification February-May (-August)

Geographic distribution: Brazil: Rio de Janeiro, São Paulo, Paraná, Santa Catarina.

Distribution at Paraná State: Mun. Bocaiúva do Sul and Campina Grande do Sul: fragments of Mountain Ombrophilous Dense Forest mixed with reforestation areas, citriculture and other crops. Mun. Piraquara: Mountain Ombrophilous Dense Forest remnants.

Material examined: Brazil, **Paraná**; Mun. **Bocaiúva do Sul**: Campina dos Tavares, 4/XII/1963, G. Hatschbach 10772 (UPCB, HBR, MBM, HUEPG); Serra S. Ana, 23/I/1974, G. Hatschbach 33713 (MBM); Chácara Serra da Bocaina, 03/III/2005, J.M. Silva and L.M. Abe 4285 (MBM, UPCB). Mun. **Campina Grande do Sul**: Morro Cêrro Verde, 28/XII/1966, G. Hatschbach 15567 (UPCB, MBM); Pico Garatuva, 8/IV/1967, G. Hatschbach 16269 (UPCB, MBM, HBR); Mun. **Piraquara**: Mananciais da Serra, 9/II/1968, L. T. Dombrowski 2948 (PKDC); Mananciais da Serra,VI/2005, M. Reginato 449 (UPCB).

Qualea grandiflora Mart. Nov. Gen. et Sp. 1:133.1824. (Figure 2-C)

Trees (2-)6-10 (-15) m high; winding trunk with suberose, quite thick cortex, young branches are tomentose, older ones are scaly; perulate tomentose buds, ovate, flat or slightly crateriform blackish stipule glands 0.2 cm diam., some with gland accessories, tomentose petiole 0.4-1.0 cm long and 0.2 cm wide. Opposite decussate leaves, discolor blade with varying in size and shape from oblong, narrowly oblong, elliptic, narrowly elliptic, ovate-lanceolate, ovate-elliptic or oblong-elliptic; usually forming a bandaging in the middle portion (7.7-) 10-20 (-20.9) cm long and (2.8-) 7 (-8) cm wide; rounded apex, acuminate or obtuse, sometimes with

a small mucro; cordate base, slightly cordate or obtuse, margin entire; coriaceous, adaxial face slightly tomentose or pubescent, adaxial face glabrous and shiny, venation brochidodromous-campdodromous. Inflorescence thyrsoid laxa 20 cm long and 8 cm wide, with cincinnus usually 1flower (-2-4flower); rachis, peduncle and pedicel tomentose. Tomentose sericeous buds, 1.5-1.7 cm long and 0.8 cm wide, with an included spur. Calix with unequal lobes, all rounded and with undulate margin, slightly sericeous; curved cylindrical spur 1.3-2.5 cm long. Obcordate yellowish-white or yellow petals, glabrous or slightly sericeous at the base (4-)5 cm wide and 6 cm long. Cordate glabrous anther (0.4-) 1.0 cm long, glabrous filament 0.15 cm long, inserted very near to the anther base. Staminodes, if present, are 2. Ovary heavily sericeous; glabrous styles 0.15 cm; sub-capitates stigmas. Fruits loculicidal ovoid capsule, woody, exocarp finely verruculose, apiculate or acuminate apex; lanceolate valves with total dehiscence, from the apex up to the base, central fibrose trigonal columella central where the seeds are inserted, valves (5-)8 cm long and (2-)3 cm wide at the mature fruit, crasso and exfoliated peduncle 1.5-3 cm long and 0.5-1.0 cm wide.

Common names: pau-terra, pau-terra-de-folha-grande, roquisia (GO, MT, MG); salta-cavaco (SP); arinoná, pau-terra-do-campo, ariuná (PA).

Uses: The bark and leaves have medicinal usage; the fruits are source of tinctorial material (yellow) (CORRÊA, 1984). The powder of the bark from the stem is used as antiseptic for external wounds (SIQUEIRA, 1988). The seed possesses exceptional amounts of lauric acid. (MAYWORM; SALATINO, 1996). The leaf extract has depressive action on the nervous central system, analgesic effect and is a potential anti-convulsion medicine (GASPI et al., 2006). The hidro-alchoolic extract of the bark has an important anti-ulcerogenic activity (HIRUMA-LIMA et al., 2006). Without usage indication at Paraná State. Due the beauty of its flowers and tree shape, the species has ornamental potentiality.

Phenology: Flowering October-February. Fructification February-June

Geographic distribution: Brazil: Amazonas to Paraná, specially occurring at the Brazilian central grassland region and Amazonian prairies. Also found in the American tropical zone outside Amazonia and at Western Paraguay.

Distribution at Paraná State: Mun. Sengés: savanna (Cerrado) remnant inserted in the grassland region (700 up to 1100 m a.s.l.). Mun. Arapoti: Seazonal Semidecidual Forest and transition zone towards Cerrado. Mun. Campo Mourão: Cerrado remnants.

Material examined: Brazil, **Paraná**, Mun. **Arapoti**: Fda. do Lobo, 22/III/1968, G. Hatschbach 18886 (UPCB, MBM, HBR); Chapadão S. Antonio, 12/I/1973, G. Hatschbach 31163 (UPCB); Fda. do Lobo, 18/VI/1973, G. Hatschbach 32170 (MBM). Mun. **Campo Mourão**, terreno baldio, 15/XII/2004, M.G. Caxambu 736 (HCF). Mun. **Jaguariaíva**, PE do Cerrado, 16/IV/1994, Schino et al. (UPCB); idem, 19/VI/1993, A.C. Cervi 4107 and Uhlmann (UPCB). Mun. **Sengés**: Fda. Sta. Gil, 16/XII/1986, Negrelle et al. 161 (UPCB).

Qualea multiflora Mart. Nov. Gen. Sp. 1:134.1824 ssp. ***multiflora*** in Stafleu Acta Bot. Neerl. 2_(2):195.1953 (Figure 2-D).

Trees or shrubs, (2-)3-8(-10) m high and 0.1-0.2 m diam.; winding trunk; glabrous branches, the younger ones sometimes with small scales at the base, older branches usually exfoliates, perulate glabrous buds; crateriform, rounded or elliptic-ovate glands with a lighter margin 1.0-2.0 mm diam., located at the petiole base, sometimes with gland accessories. Glabrous, blackish petiole (0.2-)0.4(-0.6) cm long and 0.12 cm wide. Discolor opposite leaves, rare 3-verticilate, elliptic, oblong, oblong-elliptic, narrowly oblong or narrowly obovate blades, 5-12(-20) cm long and 1.7-4.5(-7) cm wide, coriaceous to papiracea; apex acute or acuminate; acute, acute-rounded, rounded, obtuse or slightly cordate base, entire margin, venation camptodromous-broquidodromous, more prominent at the adaxial face. Inflorescence thyrsoid 9-12(-22.5) cm long and 5 cm wide, with cincinnus (-2)3-4(-5) flower, rachis sparsely pilose, tomentose sericeous peduncle and pedicel (0.4-)0.5(-1.3) cm long. Buds recovered with yellow tomentose sericeous hairs 0.7-1.0 (-1.2) cm long and 0.5 cm wide, included spur. Calyx with unequal lobes, elliptic or elliptic-ovate, sericeous, glabrous or not at the base, ciliate at margin, calcarate lobe can reach twice the size of lateral lobes base, straight spur at the young bud, curving during maturity 0.5-0.7 cm long, densely pilose. Obcordate glabrous petals, white when young and yellowish at maturity with purple (rare red or yellow) dots or lines at the centre, 2.5-3.0 cm long and 2.5-3.0 cm wide. Elliptic-ovate glabrous anther with cordate base and rostrate connective, dorsifixed, 0.4-0.5 cm long, glabrous thin filament 0.5-1.0 cm long and 0.05 cm wide.

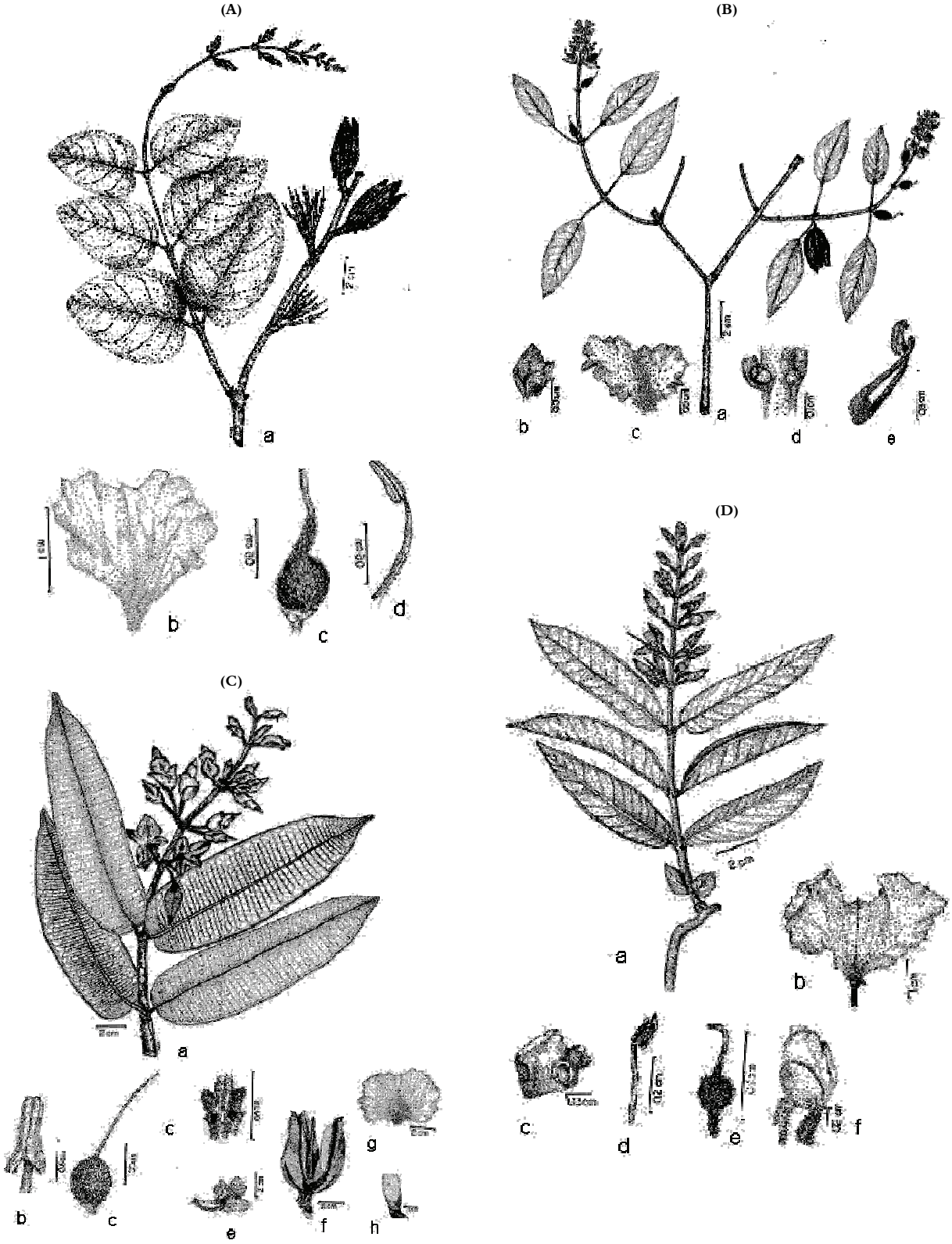

Figure 2. (A) *Q. cordate* Spreng: a) branch detail showing old fruits where exocarp is represented only by a vein net, b) petal, c) gynoecium, d) stamen; (B) *Q. glaziovii* Warm: a) branch detail with flowers, immature and mature fruits, b) floral bud at pre-anthesis, c) petal, d) detail of the urceolate gland at the petiole base, e) gynoecium and androecium; (C) *Q. grandiflora* Mart.: a) branch detail with flowers, b) stamen, c) gynoecium, d) detail of the crateriform gland at the petiole base, e) detail of the flower spur after anthesis; f) fruit post-dehiscence, g) petal, h) seeds; (D) *Q. multiflora* Mart. ssp. *multiflora*: a) branch detail with floral buds, b) petal, c) detail of the gland at the petiole base; d) stamen; e) gynoecium; f) floral bud at pre-anthesis.

Staminodes absent. Ovary heavily fulvous-sericeous, styles pilose at the base or entirely glabrous 0.9-1.2 cm long, sub-capitates stigmas. Fruits oblong loculicidal capsule with acuminate or acute apex, woody with exocarp finely verruculose; varying in size, lanceolate valves with 3-4(-10) cm long and 1.5(-3) cm wide at the mature opened fruit, crasso and exfoliated peduncle.

Common names: Pau-terra-amarelo (MS), Uvapuva-do-campo, Pau-terra (MG, SP), Louro-tinga (RJ), Cinzeiro, Pau-de-tucano, Pau-terra-do-campo.

Uses: supplies wood for canoes, crates and carpentry. The bark is rich in tannins (Corrêa, 1984). Has molluscicidal activity, specially related to *Biomphalaria glabrata*, the most important intermediate vector of *Schistosoma mansoni* (schistossomosis) (SOUZA et al., 1984). Without usage indication at Paraná State.

Phenology: Flowering February (-March). Fructification (February-) March - August

Geographic distribution: Brazil: from the Brazilian Central Plateau to Paraná State and Northern Paraguay.

Distribution at Paraná State: Mun. Sengés and Jaguariaíva: savanna (Cerrado) remnant inserted in the grassland region (700 up to 1,100 m a.s.l.).

Material examined: Brasil, **Paraná**: Mun. **Jaguariaíva**, P. E. do Cerrado, 14/XI/1992, A.C. Cervi 3836 (UPCB). Mun. **Sengés**: Fda. Morungava, Rio do Funil, 13/XII/1958, G. Hatschbach 5287 et Lange (MBM, UPCB, PKDC); Fda. Sta. Gil, 16/XII/1986, Negrelle et al. 162 (UPCB).

Conclusion

Four species of *Qualea* were registered at Paraná State, included in two sub-genus: *Amphilochia* (*Q. cordata* Spreng.; *Q. glaziovii* Warm); *Qualea* Sec. *Costatifolium* (*Q. grandiflora* Mart.; *Q. multiflora* Mart. spp. *multiflora*). Among the previously species cited for Paraná State, it was excluded *Q. cryptantha* (Spreng.) Warm., whose occurrence is restricted to the Tabuleiro Forest in the NE – region of Brazil. In general, there is insufficient information about abundance or density of individuals of *Qualea* species in the distinct locations at Paraná State.

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References

ANGELY, J. **Flora analítica do Paraná**. São Paulo: Phyton, 1965.

CORRÊA, M. **Dicionário das plantas úteis do Brasil e das exóticas cultivadas**. Rio de Janeiro: Imprensa Nacional-ISOF, 1984.

ESTRATÉGIA global para a conservação de plantas. Rio de Janeiro: Rede Brasileira de Jardins Botânicos, Instituto de Pesquisas Jardim Botânico do Rio de Janeiro, 2006.

GASPI, F. O.; FOGLIO, M. A; CARVALHO, J. E; MORENO, R. A. Pharmacological activities investigation of crude extracts and fractions from *Qualea grandiflora* Mart. **Journal of Ethnopharmacology**, v. 101, n. 1, p. 19-24, 2006.

GRANDI, T. S. M.; TRINDADE, J. A.; PINTO, M. J. F.; FERREIRA, L. L.; CATELLA, A. C. Plantas medicinais de Minas Gerais. **Acta Botanica Brasilica**, v. 3, supl., p. 185-224, 1989.

HIRUMA-LIMA, C. A.; SANTOS, L. C.; KUSHIMA, H.; PELLIZON, C. H.; BRITO, A. R. *Qualea grandiflora*, a Brazilian "Cerrado" medicinal plant presents an important antiulcer activity. **Journal of Ethnopharmacology**, v. 104, n. 1-2, p. 207-214, 2006.

IAPAR-Instituto Agrônomico do Paraná. **Cartas Climáticas do Paraná**, 2000. (CD-ROM).

ISERNHAGEN, I.; SILVA, S. M.; GALVÃO, F. Listagem de espécies arbustivo-arbóreas citadas nos trabalhos de fitossociologia florestal no Paraná, Brasil: uma contribuição aos programas de recuperação de áreas degradadas (RAD). In: **A fitossociologia florestal no Paraná e os programas de recuperação de áreas degradadas**: uma avaliação. Piracicaba: Instituto de Pesquisas e Estudos Florestais, 2002. p. 51-134, v. 1.

LISBOA, M. L. G. **Estudos taxonômicos sobre o gênero *Qualea* Aubl., subgênero *Amphilochia* (Mart.) Stafl. (Vochysiaceae A. St. Hil.)**. Campinas: Universidade Estadual de Campinas, 2000.

LINSINGEN, L.; SONEHARA, J. S.; UHLMANN, A.; CERVI, A. Composição florística do Parque Estadual do Cerrado de Jaguariaíva, Paraná, Brasil. **Acta Biológica Paranaense**, v. 35, n. 3-4, p. 197-232, 2006.

MAYWORM, M. A. S.; SALATINO, A. Fatty acid composition of "Cerrado" seed oils. **Journal of the Science of Food and Agriculture**, v. 72, n. 2, p. 226-230, 1996.

MIZOTE, L. T. M. **Avaliação da dinâmica da paisagem da área urbana do Município de Campo Mourão, Paraná**. Curitiba: Universidade Federal do Paraná, 2005.

NEGRELLE, R. R. B. **Vochysiaceae St. Hil. do Estado do Paraná, Brasil**. Curitiba: Universidade Estadual do Paraná, 1988.

RECORD, S. J.; MELL, C. D. **Timbers of tropical America**. New Haven: Yale University, 1924.

SOUZA, C. P.; AZEVEDO, M. L.; LOPES, J. L.; SARTI, S. J.; SANTOS FILHO, D.; LOPES, J. N.; VICHNEWSKI, W.; NASI, A. M.; LEITAO FILHO, H. F. Quimioprofilaxia da esquistossomose: atividade moluscicida de produtos naturais-ensaios com caramujos adultos e desovas. **Anais da Academia Brasileira de Ciências**, v. 56, n. 3, p. 333-338, 1984.

SIQUEIRA, J. C. **Plantas medicinais**: identificação e uso das espécies dos Cerrados. São Paulo: Loyola, 1988.

STAFLEU, F. A. A monograph of the Vochysiaceae III. *Qualea*. **Acta Botanica Neerlandica**, v. 2, n. 2, p. 114-217, 1953.

STRAUBE, F. C. O Cerrado no Paraná: ocorrência original e atual e subsídios para a sua conservação. **Cadernos de Biodiversidade**, v. 1, p. 12-24, 1998.

UHLMANN, A. **Análise fitossociológica de três categorias fitofisionômicas no Parque Estadual do Cerrado – Jaguariaíva, Paraná**. Curitiba: Universidade Federal do Paraná, 1995.

UHLMANN, A.; GALVÃO, F.; SILVA, S. M. Análise da estrutura de duas unidades fitofisionômicas de savana (Cerrado) no sul do Brasil. **Acta Botanica Brasilica**, v. 12, n. 3, p. 231-247, 1998.

VIANNA, M. C.; MARTINS, H. F. **Flora ilustrada catarinense-voquisiáceas**. Itajaí: HBR. 2001.

WARMING, E. Vochysiaceae. In: MARTIUS, C. F. P. (Ed.). **Flora brasiliensis**. Monachii: Oldenburg, 1875. p. 17-116, v. 13, n. 2.

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