THE VASCULAR FLORA OF THE CERRADO IN EMAS NATIONAL PARK (GOIÁS, CENTRAL BRAZIL)

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ABSTRACT

The cerrado, a savanna-like ecosystem, is the second largest vegetation type in Brazil, originally covering about two million km^2 (or 23%) of the Brazilian territory. The Emas National Park (ENP), comprising about 133,000 ha, is one of the most important reserves within the cerrado. From November 1998 to October 1999, we carried out a floristic survey of all the cerrado physiognomies of the ENP and found 601 species, belonging to 303 genera and 80 families. Among the collected species, 12 were weeds and seven were new to science. The herbaceous to woody species ratio was 3.03:1. The richest families were Asteraceae (88 species), Fabaceae (87), Poaceae (51), Myrtaceae (39), and Lamiaceae (24); these five families comprised 48% of the total number of species. The results obtained show the importance of the ENP to cerrado conservation, since from 8 to 20% of the species recorded for this vegetation type occur within the reserve. We emphasize the need for more floristic surveys in which the frequently overlooked herbaceous component should also be sampled.

Key words: cerrado, savanna, floristics, Emas National Park, central Brazil

RESUMEN

El cerrado, un tipo de sabana, es el segundo mayor tipo de vegetación de Brasil. Una de las reservas más importantes destinada a proteger el cerrado es el "Parque Nacional das Emas" (PNE), con un área aproximada de 133.000 ha. En el periodo de noviembre de 1998 a octubre de 1999, fue realizado un levantamiento florístico en las fisionomías de cerrado del PNE, encontrándose 601 especies pertenecientes a 303 géneros y 80 familias. De entre las especies colectadas, fueron encontradas 12 invasoras y siete nuevas para la ciencia. La proporción entre especies herbáceo-subarbustivas y arbustivo-arbóreas fue de 3,03:1. Las familias más ricas en especies fueron: Asteraceae (88 especies), Fabaceae (87), Poaceae (51), Myrtaceae (39) e Lamiaceae (24), compreendiendo 48% del total de especies. Los resultados mostraron la importancia del PNE para la conservación del cerrado, ya que en esta reserva aparecen de 8 a 20 % de las especies listadas para dicha formación vegetal. Resaltamos aquí la necesidad de realizar levantamientos floristicos contemplando también el componente herbáceo-subarbustivo, frecuentemente olvidado.

INTRODUCTION

The Cerrado Domain, the second largest Brazilian phytogeographic province, once covered about 2 million km^2, or 23% of the Brazilian territory, with its core area in central Brazil (Ratter et al. 1997). As its name implies, cerrado vegetation prevails in the Cerrado Domain. The cerrado vegetation is not uniform in physiognomy (Coutinho 1990), ranging from grassland to tall woodland, but most of its physiognomies within the range defined as tropical savanna

(Sarmiento 1983). In the Cerrado Domain, interspersed with the prevailing cerrado vegetation, there are other vegetation types, such as seasonal forest, riparian forest, rocky *campo*, and wet *campo*.

Although frequently neglected in the past, the cerrado vegetation stands out in its high floristic richness (Ratter et al. 1997). After comparing a large number of floristic and phytosociological surveys carried out in cerrado sites from all over Brazil, Castro et al. (1999) estimated that 3,000 to 7,000 vascular plant species occur in this vegetation type. In addition to its high floristic richness, the cerrado presents a high degree of endemism. Lenthall et al. (1999), for instance, listed 234 woody species occurring in 10 cerrado sites and verified that 80% of them were restricted to this vegetation type. Owing to its high richness, high degree of endemism, and present conservation status, Fonseca et al. (2000) included the cerrado among the biodiversity hotspots for highest priority conservation in the world.

According to Rizzini (1963), the cerrado flora consists of an herbaceous and a woody component, which compete because both are heliophilous, i.e., there is no shade-adapted ground layer. Following Coutinho's (1990) concept of cerrado, the importance of the herbaceous component decreases from open to closed physiognomies, whereas the importance of the woody component increases. In most forms of cerrado, the herbaceous component is much richer in species, as demonstrated by Mantovani and Martins (1993), who found a ratio between herbaceous and woody species ranging from 2:1 to 3:1 in the comparison of some southern cerrado sites. However, despite its richness, Castro et al. (1999) pointed out the almost complete absence of existing surveys on the herbaceous component of the cerrado. These authors also highlighted the uneven distribution of surveys, which tend to be concentrated on few well studied areas (Castro et al. 1999).

The Emas National Park (ENP) is the largest and one of the most important reserves among those in the Cerrado Domain (Conservation International 1999). Although some papers about its fauna and wildfires exist (e.g., Ramos-Neto & Pivello 2000; Rodrigues & Monteiro 2000), the ENP's vegetation remains poorly studied. The present work was designed as an intense and systematic floristic survey to provide a better knowledge of the ENP's flora in particular and of the cerrado flora in general, especially concentrating on the still poorly known herbaceous component. Furthermore, this survey is intended to provide a basis for other studies to be carried out in the ENP and for phytogeographical studies on the cerrado flora.

To achieve these aims, we have tried to answer the following questions: What is the floristic composition of the cerrado physiognomies in ENP? Which families are the richest ones in its flora? Does the herbaceous to woody species ratio lie within the range described by Mantovani and Martins (1993), that is, be-

tween 2:1 and 3:1? Are there woody species that should be included in the checklist elaborated by Castro et al. (1999)?

SITE SUMMARY

Created in 1961, the ENP is located in the Brazilian Central Plateau, southwestern Goiás State (17°49'-18°28'S, 52°39'-53°10'W), in the cerrado core region, and comprises 132,941 ha. Regional climate is humid tropical with wet summer and dry winter, classified as Aw following Köppen's (1948) system. Annual rainfall varies from 1,200 to 2,000 mm, concentrated from October to March, and mean annual temperature lies around 24,6°C (Ramos-Neto & Pivello 2000). Three quarters of the ENP consist of flat tableland, 820–888 m high, and the remaining area consists of hilly terrain, 720–820 m high (Ramos-Neto & Pivello 2000). Recently, ENP was included by UNESCO (2001) in the World Natural Heritage List as one of the sites containing flora, fauna, and key habitats that characterize the cerrado.

The cerrado in ENP exhibits almost all physiognomies found in this vegetation type. Following Coutinho's (1990) classification and Sarmiento's (1984) translation, the cerrado in ENP ranges from *campo limpo* (a grassland) to *cerrado sensu stricto* (a woodland). In the reserve, open cerrado physiognomies—*campo limpo, campo sujo* (a shrub savanna), and *campo cerrado* (a savanna woodland)—prevail, covering 68.1% of the total area, especially on the flat tableland (Ramos-Neto & Pivello 2000). The more closed *cerrado sensu stricto* covers 25.1% of the reserve, mainly on the hilly terrain. Other vegetation types, such as wet campo (4.9% of the total area) and riparian and seasonal semideciduous forests (1.2%), also exist within the park.

METHODS

We surveyed all cerrado physiognomies occurring within the reserve from November 1998 to October 1999, in monthly field trips, each one with a 50–60 hr. sampling effort in the field. We established routes through the firebreaks that cross the reserve (Fig. 1) and covered one of them each day by driving a vehicle and stopping whenever vegetation of interest was seen. The routes comprised the following reference points (with approximate distances): i) U2, U1, Q, R, S, T, U2 (51.5 km); ii) U2, V, P1, O, U1 (52.5 km); iii) O, M, N, P1 (45 km); iv) V, P2, W, Y, V (47.5 km); v) X, Z1, Z2, Z3, Z2, Z1, Y, W, X (47.5 km); vi) A, B, J, G, D, C, K2, K1, A (48 km).

We collected fertile botanical material along the pre-established routes. During the last two field trips, we also collected sterile material from species previously not found in reproductive stages. The collected material was identified to species level by comparing it with lodged vouchers and consulting taxonomic references. The specimens were then sent to taxonomists for confirma-

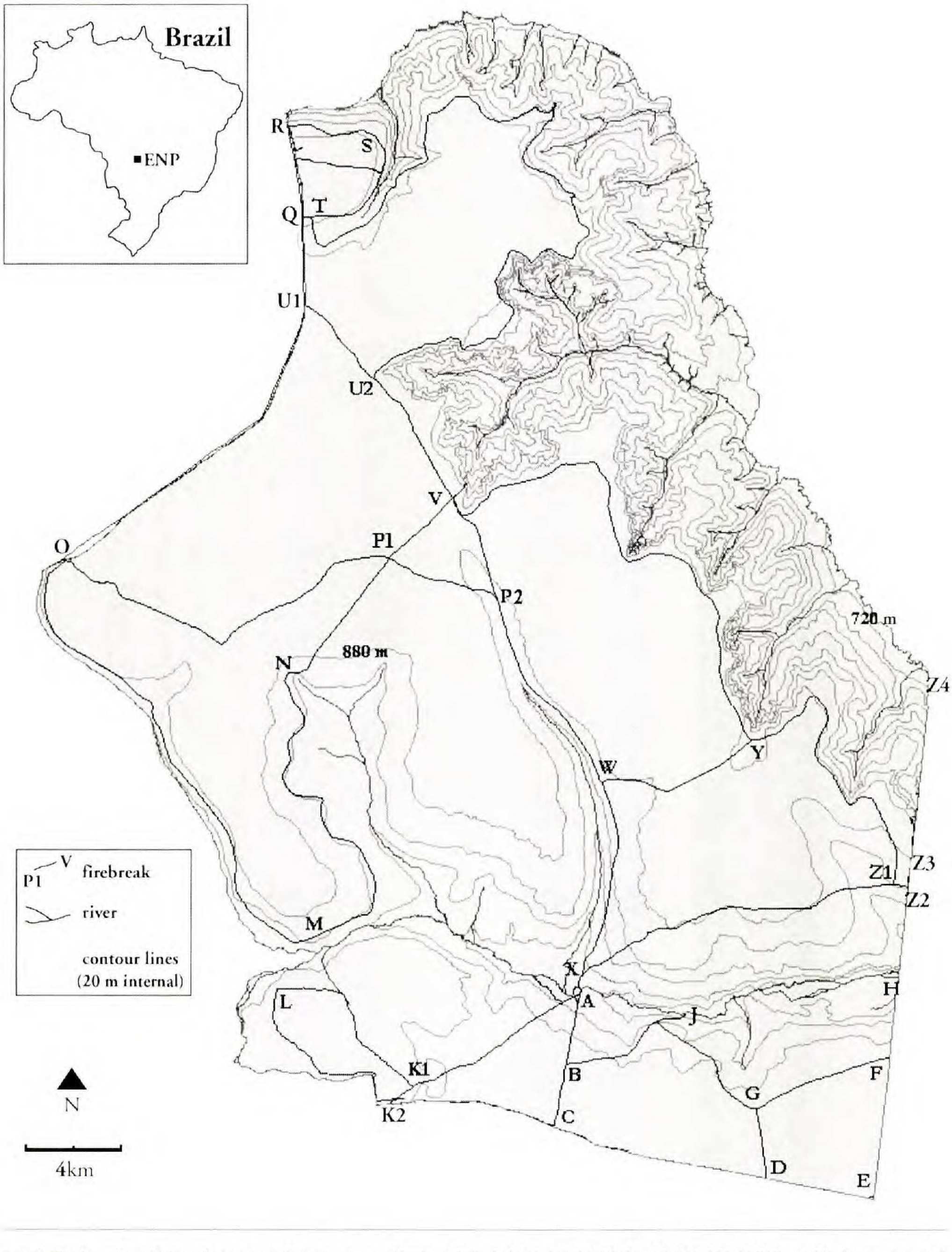

Fig. 1. Firebreaks, with reference points, in Emas National Park (17° 49'-18'28'S, 52° 39'-53° 10'W), Goiás State, central Brazil.

tion. The voucher material was stored in the herbaria of the São Paulo Botanical Institute (SP) and State University of Campinas (UEC).

We classified the species in families according to the system proposed by Judd et al. (1999) and in life forms following Raunkiaer's (1934) system adapted by Mueller-Dombois and Ellenberg (1974). We considered the chamaephytes,

epiphytes, hemicryptophytes, geophytes, lianas, vascular parasites, and therophytes as belonging to the herbaceous component and the phanerophytes as belonging to the woody component. We applied the chi-square test (Zar 1999) to verify whether the herbaceous to woody species ratio was significantly different from the expected by Mantovani and Martins (1993). The results found were also compared to the patterns obtained by Castro et al. (1999).

RESULTS

We collected 2,123 voucher specimens, representing 601 species, 303 genera, and 80 families (Appendix 1). Out of these 601 species, 571 were identified to species level, including one new to science, *Piriqueta emasensis* Arbo (Turneraceae). Six out of the remaining 30 species were also new to science and are currently being described by taxonomists: *Annona* sp. nov. (Annonaceae), *Gyrostelma* sp. nov. (Apocynaceae), *Dimmerostema* sp. nov. (Asteraceae), *Ipomoea* sp. nov. (Convolvulaceae), *Hybanthus* sp. nov. (Violaceae), and another Convolvulaceae that belongs to a new genus. There were 22 species identified to genus level, one identified to family level (Fabaceae sp.), and one that we could not identify even to family level.

Twelve species (2.0% of the total number of species) were considered by Mendonça et al. (1998) as weeds that do not occur spontaneously in the cerrado. Of the 601 species, 149 were phanerophytes and thus included in the woody component, while 452 belonged to other life forms and were included in the herbaceous component. The herbaceous to woody species ratio was 3.03:1, a value not significantly different ($\chi^2 = 0.014$, $P = 0.906$) from the highest ratio (3:1) set by Mantovani and Martins (1993).

The richest families were Asteraceae (88 species), Fabaceae (87), Poaceae (51), Myrtaceae (39), Lamiaceae (24), Malpighiaceae (23), Euphorbiaceae (20), Apocynaceae (19), Malvaceae (16), Rubiaceae (16), and Convolvulaceae (15), which together summed up 66.2% of the total number of species. In the herbaceous component, the richest families were Asteraceae (85 species), Fabaceae (59), Poaceae (48), Lamiaceae (23), Euphorbiaceae (19), Malpighiaceae (16), Myrtaceae (16), Convolvulaceae (15), and Apocynaceae (14), which comprised 65.27% of the herbaceous species. In the woody component, the richest families were Fabaceae (28), Myrtaceae (23), Malpighiaceae (7), Melastomataceae (7), Annonaceae (6), Apocynaceae (5), Vochysiaceae (5), Bignoniaceae (4), Nyctaginaceae (4), and Rubiaceae (4), which together accounted for 62.42% of the woody species.

Seventeen out of the 149 woody species (11.4%) did not appear on the checklist of the cerrado woody flora established by Castro et al. (1999): *Annona* sp. nov., *Aiouea trinervis* Meisn., *Apoclada arenicola* McClure, *Banisteriopsis acerosa* (Nied.) B. Gates, *Calliandra macrocalyx* Harms, *Dalbergia cuiabensis* Benth., *Mimosa amnis-atri* Barneby, *M. gemmulata* Barneby, *M. hebecarpa* Benth.,

Myrcia bracteata O. Berg, *M. camapuanensis* N.F.E. Silveira, *M. crassifolia* (O. Berg) Kiaersk., *M. fallax* (Rich.) A. DC., *M. linguaeformis* Kiaersk., *M. rhodeosepala* Kiaersk., *Olyra taquara* Sw., and *Psidium laruotteanum* Cambess.

DISCUSSION

If we assume that the number of species in the cerrado ranges from 3,000 to 7,000 (Castro et al. 1999), then the ENP contains approximately 8.5 to 20.0% of the cerrado flora. These figures show the importance of this reserve for the conservation of the cerrado vegetation. The number of species in ENP might be increased by species not found in our survey. Floristic surveys certainly miss a number of species in a given area, especially those that are not at reproductive stage at the time of the visit, flower sporadicaly, are ephemeral, or are inconspicuous, problems that particularly affect the herbaceous component of the vegetation (Mantovani & Martins 1993; Castro et al. 1999).

Among the 601 species found in the ENP, seven are new to science. Although the cerrado is one of the most studied vegetation types in Brazil (Castro et al. 1999), the fact that undescribed species keep on appearing in floristic surveys—for example, also in Brasília, Federal District (Pereira et al. 1993)—shows that the cerrado has not yet been satisfactorily sampled. The affirmation that the tropical flora remains undercollected (Prance et al. 2000) seems to apply also to the cerrado vegetation. Some of the species not identified to species level in our inventory may be new to science as well.

Although the proportion of weedy species in the ENP's cerrado flora was lower than the ca. 5% found by Mendonça et al. (1998) for the whole Cerrado Domain, the invasion of ruderal plants in ENP is alarming, notably the African grasses *Brachiaria decumbens* Stapf and *Melinis minutiflora* P. Beauv. Plant invasion has become a great problem in virtually all cerrado fragments (Pivello et al. 1999) and will grow into a serious problem in the ENP if precautions are not taken.

The richest families in the ENP were also the richest ones in other cerrado sites (Mantovani & Martins 1993; Batalha et al. 1997; Batalha & Mantovani 2000). Exceptions were Convolvulaceae and Lamiaceae, well represented only in the ENP. The herbaceous to woody species ratio, although not significantly different from the maximum set by Mantovani and Martins (1993), was higher than the ratios found in other surveys (Mantovani & Martins 1993; Batalha et al. 1997; Batalha & Mantovani 2000). This probably was a consequence of the prevalence of open physiognomies (*campo limpo* and *campo sujo*) in ENP.

According to Castro et al. (1999), surveys in poorly sampled regions should augment the cerrado woody species checklist. Indeed, the 17 species found in our survey that should be included in their list represent a high percentage of the species collected in ENP and indicate that even the woody component of the cerrado vegetation remains undercollected. As for the herbaceous compo-

nent, this undercollection might be even greater. In the visits we paid to herbaria and in our search for references, the absence of surveys in this component became evident.

Species inventories, even at the most basic level, are available for only about 1% of the tropical regions (Hammond 1992). Our floristic survey of the dominant cerrado vegetation in the ENP represents a first step, and it will be necessary to survey the other vegetation types existing within the reserve, such as seasonal semideciduous forest, riparian forest, wet *campo*, and the aquatic vegetation of streams, rivers, and lakes.

APPENDIX 1

Species collected in the floristic survey of the cerrado vegetation in Emas National Park (17°49'-18°28'S, 52°39'-53°10'W), Goiás State, central Brazil. Taxa were listed alphabetically by family, genus, and species. The format used was species name, authority, collection number, and life form. Authorities were abbreviated according to Brummit and Powell (1992). Species designated by an asterisk (*) were considered non-native weeds by Mendonça et al. (1998). All specimens were collected by M.A. Batalha (B). Life form was assigned according to Raunkiaer's (1934) system adapted by Muller-Dombois and Ellenberg (1974). Life form classes were abbreviated as: Ch = chamaephyte, Ep = epiphyte, Geo = geophyte, H = hemicryptophyte, Li = Liana, Ph = phanerophyte, Th = therophyte, and Vp = vascular parasite.

APPENDIX 1

The vascular flora of the cerrado in Emas National Park (central Brazil).

ACANTHACEAE
Hygrophila brasiliensis (Spreng.) Lindau, B 2306, H
Ruellia geminiflora Kunth, B 2169, H
Ruellia incompta (Nees) Lindau, B 3592, Ch

ALSTROEMERIACEAE
Alstroemeria gardneri Baker, B 2715, H

AMARANTHACEAE
Froelichia procera (Seub.) Pedersen, B 2123, H
Gomphrena arborescens L. f., B 2395, H
Gomphrena macrocephala A. St-Hil., B 2214, H
Gomphrena pohlii Moq., B 2091, H
Pfaffia helichrysoides (Moq.) Kuntze, B 2152, H
Pfaffia jubata Mart., B 2283, H

ANACARDIACEAE
Anacardium humile A. St-Hil., B 2050, Ch
Tapirira guianensis Aubl., B 3804, Ph

ANNONACEAE
Annona coriacea Mart., B 695, Ph
Annona crassiflora Mart., B 2403, Ph
Annona monticola Mart., B 3620, H
Annona tomentosa R.E. Fries, B 2347, Ch
Annona warmingiana Mello-Silva & Pirani, B 3763, H
Annona sp. nov., B 2621, Ph
Bocageopsis mattogrossensis (R.E. Fries) R.E. Fries, B 3506, Ph
Duguetia furfuracea (A. St-Hil.) Benth. & Hook. f., B 2180, Ph
Duguetia glabriuscula (R.E. Fries) R.E. Fries, B 1955, Ch
Xylopia aromatica (Lam.) Mart., B 2515, Ph

APIACEAE
Didymopanax macrocarpum (Cham. & Schltdl.) Seem., B 2107, Ph
Didymopanax malmei Harms, B 2733, Ph
Eryngium ciliatum Cham. & Schltdl., B 3890, H
Eryngium junceum Cham. & Schltdl., B 2566, H

APOCYNACEAE
Asclepias mellodora A. St-Hil., B 2967, H

Aspidosperma macrocarpon Mart., B 2232, Ph
Aspidosperma nobile Müll. Arg., B 3661, Ph
Aspidosperma tomentosum Mart., B 4028, Ph
Barjonia cymosa Fourn., B 2897, H
Barjonia erecta (Vell.) K. Schum., B 2182, H
Blepharodon bicuspidatum Fourn., B 2451, Li
Gyrostelma sp. nov., B 2081, H
Hancornia speciosa Gomez, B 2106, Ph
Hemipogon acerosus Decne., B 2083, H
Himatanthus obovatus (Müll. Arg.) Woods., B 2380, Ph
Macrosiphonia longiflora Müll. Arg., B 2218, H
Macrosiphonia velame (A. St-Hil.) K. Schum., B 2610, H
Mandevilla coccinea (Hook. & Arn.) Woods., B 2577, H
Mandevilla pohliana (Standelm.) A. Gentry, B 2099, H
Odontadenia lutea (Vell.) Markgr., B 2645, Li
Oxypetalum aequaliflorum Fourn., B 2241, H
Rauvolfia weddelliana Müll. Arg., B 1962, H
Rhodocalyx rotundifolius Müll. Arg., B 2281, H

ARACEAE

Scaphispatha gracilis Brongn. ex Schott, B 2075, H

ARECACEAE

Acrocomia aculeata (Jacq.) Lodd. ex Mart., B 2498, Ph
Acrocomia hassleri (Barb. Rodr.) Hahn, B 3828, Geo
Allagoptera campestris (Mart.) Kuntze, B 2006, Geo
Allagoptera leucocalyx (Mart.) Kuntze, B 2215, Geo
Attalea geraensis Barb. Rodr., B 2509, Geo
Syagrus flexuosa (Mart.) Becc., B 2249, Geo

ARISTOLOCHIACEAE

Aristolochia gibertii Hook., B 2852, Li
Aristolochia gracilis Duch., B 4029, Li

ASTERACEAE

Acanthospermum australe (Loefl.) Kuntze, B 2527, Th
Achyrocline satureoides (Lam.) A. DC., B 3400, Th
Apopyros warmingii (Baker) Nesom, B 2176, H
Aspilia foliacea (Spreng.) Baker, B 3377, H
Aspilia laevissima Baker, B 2704, H
Aspilia leucoglossa Malme, B 2122, H
Aspilia platyphylla (Baker) Blake, B 2848, H
Ayapana amygdalina (Lam.) King & H. Rob., B 3458, H
Baccharis camporum A. DC., B 3313, Ch
Baccharis humilis Sch. Bip., B 2172, H
Bidens gardneri Baker, B 3031, Th
Calea clausseniana Baker, B 3771, H
Calea cuneifolia A. DC., B 4011, H
Calea hymenolepis Baker, B 2886, H
Calea platylepis Sch. Bip. ex Baker, B 3204, H
Campuloclinium chlorolepis Baker, B 3120, H
Campuloclinium megacephalum (Mart.) King & H. Rob., B 2605, H
Chaptalia integerrima (Vell.) Burkart, B 2089, Th
Chromolaena chaeseae H. Rob., B 3314, Ch
Chromolaena leucocephala Gardner, B 3409, Ch
Chromolaena squalida (A. DC.) King & H. Rob., B 2328, Ch
Chromolaena stachyophylla (Spr.) King & H. Rob., B 3416, H
Conyza bonariensis (L.) Cronq., B 2497, Th
Dasyphyllum sprengelianum (Gardner) Cabrera, B 3042, Ch
Dimmerostema asperatum Blake, B 2592, H
Dimmerostema brasilianum Cass., B 3161, H
Dimmerostema retifolium (Sch. Bip.) Blake, B 2246, H
Dimmerostema sp. nov., B 2010, H
Elephantopus biflorus Less., B 3159, H
Elephantopus mollis L., B 3128, H
Elephantopus racemosus Gardner, B 3412, H
Emilia coccinea (Sims.) Sweet *, B 2364, Th
Erechtites hieracifolia (L.) Raf. *, B 2368, Th
Eremanthus erythropappus Sch. Bip., B 2213, Ph
Eremanthus glomerulatus Less., B 3333, Ph
Eremanthus sphaerocephalus Baker, B 2273, H
Eupatorium betonicaeforme Baker, B 3402, H
Eupatorium campestre A. DC., B 1996, H
Eupatorium lanigerum Hook. & Arn., B 3946, H
Eupatorium myriocephalum Gardner, B 3406, Ch
Eupatorium purpurascens Sch. Bip., B 3093, H
Eupatorium urticifolium L. f., B 1973, H
Eupatorium sp., B 3309, H
Gochnatia barrosoae Cabrera, B 3484, Ch
Gochnatia pulchra Cabrera, B 3014, Ch
Hoehnephyton trixoides (Gardner) Cabrera, B 3596, H
Ichthyothere sp. 1, B 2121, H
Ichthyothere sp. 2, B 3792, H
Ichthyothere sp. 3, B 3563, H
Isostigma megapotamicum Scherff, B 2149, H
Isostigma sp., B 3819, H
Mikania cordifolia (L.) Willd., B 3156, Li

Orthopappus angustifolius (Sw.) Gleason *, B 2402, H
Piptocarpha rotundifolia (Less.) Baker, B 1957, Ph
Porophyllum angustissimum Gardner, B 2513, Th
Pseudobrickellia pinifolia (Spr.) King & H. Rob., B 3491, H
Pterocaulon virgatum (L.) A. DC., B 3155, H
Riencourtia oblongifolia Gardner, B 2331, H
Riencourtia tenuifolia Gardner, B 2256, H
Spilanthes nervosa Chod., B 1900, H
Stilpnopappus glomerulatus Gardner, B 2877, H
Stilpnopappus speciosus Baker, B 2504, H
Stomatanthes dictyophyllum (A. DC.) King & H. Rob., B 2555, H
Vernonia argentea Less., B 2388, H
Vernonia bardanoides Less., B 2514, H
Vernonia brevipetiolata Sch. Bip., B 3189, H
Vernonia buddleiifolia Sch. Bip. ex Baker, B 2338, H
Vernonia compactiflora Mart. ex Baker, B 2867, H
Vernonia desertorum Mart. ex A. DC., B 3567, H
Vernonia erythrophylla Mart., B 2094, H
Vernonia ferruginea Less., B 3510, H
Vernonia grandiflora Less., B 2487, H
Vernonia herbacea (Vell.) Rusby, B 1992, H
Vernonia ignobilis Less., B 2168, H
Vernonia polyanthes (Spreng.) Less., B 2336, Ch
Vernonia psilophylla A. DC., B 2832, H
Vernonia rubricaulis Humb. & Bonpl., B 2375, H
Vernonia rubriramea Mart., B 3191, Ch
Vernonia simplex Less., B 4014, H
Vernonia tomentella Mart. ex A. DC., B 2063, H
Vernonia tragiaefolia A. DC., B 2172, H
Vernonia varroniifolia A. DC., B 3304, H
Vernonia venosissima Sch. Bip. ex Baker, B 2001, H
Vernonia virgulata Mart., B 2033, H
Viguiera bakeriana Blake, B 2414, H
Viguiera sp. 1, B 2084, H
Viguiera sp. 2, B 1960, H
Wedelia macedoi H. Rob., B 3920, H

BALANOPHORACEAE

Langsdorffia hypogea Mart., B 4030, VP

BIGNONIACEAE

Anemopaegma arvense (Vell.) Stellfeld ex de Souza, B 2883, H
Anemopaegma glaucum Mart. ex A. DC., B 3035, H
Anemopaegma scabriusculum Mart. ex A. DC., B 1938, H
Arrabidaea brachypoda (A. DC.) Bur., B 2272, Ch
Arrabidaea pulchra (Cham.) Sandw., B 2460, Li
Cybistax antisyphilitica Mart., B 3246, Ph
Jacaranda caroba (Vell.) A. DC., B 2279, Ch
Jacaranda decurrens Cham., B 3799, Ch
Jacaranda rufa Silva Manso, B 2267, Ch
Memora pedunculata (Vell.) Miers, B 2063, Ch
Tabebuia aurea (Silva Manso) S. Moore, B 3557, Ph
Tabebuia ochracea (Cham.) Standl., B 3659, Ph
Zeyheria montana Mart., B 2661, Ph

BORAGINACEAE

Cordia villicaulis Fresen., B 3811, H

BROMELIACEAE

Aechmea bromeliifolia (Rudge) Baker, B 2474, Ep
Ananas ananassoides L.B. Sm., B 2878, H
Bilbergia magnifica Mez, B 3755, Ep
Bromelia balansae Mez, B 2013, H
Dickia tuberosa (Vell.) Beer, B 2839, H

BURSERACEAE

Protium ovatum Engl., B 1930, Ph

CACTACEAE

Epiphyllum phyllanthus (L.) Haw., B 3878, Ep

CARYOCARACEAE

Caryocar brasiliense Cambess., B 1989, Ph

CARYOPHYLLACEAE

Polycarpaea corymbosa (L.) Lam., B 3359, Th

CELASTRACEAE

Plenckia populnea Reissek, B 2277, Ph
Tontelea micrantha (Mart.) A.C. Sm., B 1934, Ph

CHRYSOBALANACEAE

Couepia grandiflora (Mart. & Zucc.) Benth. ex Hook. f., B 3717, Ph
Licania humilis Cham. & Schltdl., B 3034, Ph
Parinari excelsa Sabine, B 1978, Ch

CLUSIACEAE

Kielmeyera abdita Saddi, B 2095, Ch
Kielmeyera coriacea Mart., B 2119, Ph
Kielmeyera grandiflora (Wawra) Saddi, B 2061, Ph
Kielmeyera rubriflora Cambess., B 3022, Ph
Kielmeyera trichophora Mart., B 2035, Ch
Kielmeyera variabilis Mart., B 1915, Ch

COCHLOSPERMACEAE

Cochlospermum regium (Mart.) Pilg., B 2428, H

COMBRETACEAE

Buchenavia tomentosa Eichl., B 4031, Ph
Combretum hilarianum D. Dietr., B 2133, Ch

COMMELINACEAE
Commelina obliqua Vahl, B 2060, Th

CONNARACEAE
Connarus suberosus Planch., B 2374, Ph
Rourea induta Planch., B 1931, Ph

CONVOLVULACEAE
Evolvulus cressoides Mart., B 2917, H
Evolvulus fuscus Meisn., B 3974, H
Evolvulus macroblepharis Mart., B 3252, H
Ipomoea argentea Meisn., B 2651, H
Ipomoea campestris Meisn., B 3524, H
Ipomoea procumbens Mart. ex Choisy, B 2613, H
Ipomoea procurrens Meisn., B 2295, Li
Ipomoea sp. nov., B 2357, H
Ipomoea virgata Meisn., B 3415, H
Jacquemontia guaranitica Hassl., B 2636, H
Jacquemontia sphaerocephala Meisn., B 2363, H
Merremia contorquens (Choisy) Hall. f., B 2600, Li
Merremia digitata Meisn., B 2140, Li
Turbina abutiloides (Kunth) O'Donnell, B 2512, H
Convolvulaceae sp. 1, gen. et sp. nov., B 1967, H

CUCURBITACEAE
Cayaponia espelina Cogn., B 2118, Li
Ceratosanthes hilariana Cogn., B 3645, Li
Melancium campestre Naud., B 2608, H

CYPERACEAE
Bulbostylis junciformis (Kunth) C.B.Clarke, B 2300, H
Bulbostylis paradoxa (Spreng.) Lindm., B 3565, H
Bulbostylis sphaerocephala (Nees) C.B. Clarke, B 2046, H
Bulbostylis truncata (Nees) M.T. Strong, B 3971, H
Cyperus aggregatus (Willd.) Endl., B 2023, H
Cyperus meyenianus Kunth, B 2707, H
Kyllinga odorata Vahl, B 2931, H
Rhynchosphora diamantina (C.B.Clarke) Kükenth, B 2316, H
Rhynchosphora emaciata Boeck., B 3087, H
Rhynchosphora exaltata Kunth, B 2466, H
Rhynchosphora rugosa (Vahl) Gale, B 3534, H
Scleria scabra Willd., B 2310, H

DILLENIACEAE
Davilla elliptica A. St-Hil., B 2080, Ph
Davilla nitida (Vahl) Kubitzki, B 3988, Li

DIOSCOREACEAE
Dioscorea amaranthoides Presl, B 3124, Li
Dioscorea claussenii Uline, B 3044, Li

EBENACEAE
Diospyros hispida A. DC., B 2031, Ph

ERYTHROXYLACEAE
Erythroxylum campestre A. St-Hil., B 2228, Ph
Erythroxylum deciduum A. St-Hil., B 3716, Ph
Erythroxylum suberosum A. St-Hil., B 1965, Ph

EUPHORBIACEAE
Chamaesyce caecorum (Mart. ex Boiss.) Croizat, B 2137, H
Cnidosculus quercifolius Pohl, B 1946, H
Croton aberrans Müll. Arg., B 2036, H
Croton antisyphiliticus Mart., B 2017, H
Croton cinctus Müll. Arg., B 3109, H
Croton glandulosus Müll. Arg., B 2389, H
Croton goyazensis Müll. Arg., B 2222, H
Croton lundianus Müll. Arg., B 2205, H
Croton pohlianus Müll. Arg., B 2196, H
Croton sclerocalyx Müll. Arg., B 2885, H
Croton sp., B 1964, H
Dalechampia humilis Müll. Arg., B 1981, H
Dalechampia linearis Baill., B 2076, H
Julocroton humilis Didr., B 2207, H
Manihot caerulescens Pohl, B 2459, H
Manihot tripartita (Spreng.) Müll. Arg., B 1908, H
Maprounea guianensis Aubl., B 3930, Ph
Phyllanthus orbiculatus Müll. Arg., B 2445, Th
Sapium glandulatum (Vell.) Pax, B 2301, Ch
Sebastiania bidentata (Mart.) Pax, B 2430, H

FABACEAE
Acosmium subelegans (Mohl.) Yakovlev, B 3815, Ph
Aeschynomene marginata Benth., B 2716, Th
Aeschynomene oroboides Benth., B 2055, H
Anadenanthera falcata (Benth.) Speg., B 2650, Ph
Andira cuiabensis Benth., B 2045, Ph
Andira laurifolia Benth., B 2342, Ch
Andira vermifuga (Mart.) Benth., B 3718, Ph
Arachis tuberosa Bong. ex Benth., B 2275, H
Bauhinia rufa Steud., B 1907, Ph
Bowdichia virgilioides Kunth, B 3350, Ph
Calliandra dysantha Benth., B 1979, Ch
Calliandra macrocalyx Harms, B 2230, Ph
Calopogonium sericeum (Benth.) Chodat ex Hassl., B 2569, Li
Camptosema ellipticum (Desv.) Burkart, B 3232, Li
Centrosema venosum Mart. ex Benth., B 1924, Li
Chamaecrista basifolia (Vogel) Irwin & Barneby, B 2710, Ch

Chamaecrista campestris Irwin & Barneby, B 2723, Ch
Chamaecrista cotonifolia (G. Don) Killip, B 4001, Ch
Chamaecrista desvauxii (Collad.) Killip, 2457, Ch
Chamaecrista filicifolia (Benth.) Irwin & Barneby, B 2325, Ch
Chamaecrista flexuosa (L.) Greene, B 2290, Ch
Chamaecrista lundii (Benth.) Irwin & Barneby, B 3435, H
Chamaecrista nictitans (L.) Moench., B 2726, Ch
Chamaecrista planaltoana (Harms) Irwin & Barneby, B 2208, H
Chamaecrista rotundifolia (Pers.) Greene, B 1974, H
Chamaecrista setosa (Vogel) Irwin & Barneby, B 2725, Ch
Clitoria densifolia (Presl) Benth., B 2433, H
Copaifera langsdorffii Desf., B 2127, Ph
Crotalaria maypurensis Kunth, B 2597, Th
Crotalaria nitens Benth., B 2724, H
Crotalaria velutina Benth., B 2881, H
Dalbergia cuiabensis Benth., B 3214, Ph
Dalbergia miscolobium Benth., B 3504, Ph
Desmodium barbatum (L.) Benth., B 3024, H
Desmodium incanum (Sw.) A. DC., B 2523, Th
Desmodium platycarpum Benth., B 3944, H
Dimorphandra mollis Benth., B 2047, Ph
Dioclea bicolor Benth., B 2042, Li
Diptychandra aurantiaca Tul., B 3056, Ph
Eriosema crinitum (Kunth) Gardner, B 2483, H
Eriosema cupreum Harms, B 2120, H
Eriosema glabrum Mart. ex Benth., B 2251, H
Eriosema heterophyllum Benth., B 3992, H
Eriosema longifolium Benth., B 2194, H
Eriosema rufum Kunth, B 2444, H
Galactia decumbens (Benth.) Chodat & Hassl., B 2371, H
Galactia dimorpha Burk., B 2130, H
Galactia martii A. DC., B 3512, H
Harpalyce brasiliana Benth., B 2548, Ph
Hymenaea stigonocarpa Mart., B 2326, Ph
Indigofera gracilis Bong., B 2057, H
Lupinus subsessilis Benth., B 2320, H
Machaerium acutifolium Vogel, B 2115, Ph
Mimosa amnis-atri Barneby, B 3589, Ph
Mimosa distans Benth., B 2070, Ch
Mimosa foliolosa Benth., B 2367, Ph
Mimosa gemmulata Barneby, B 2012, Ph
Mimosa gracilis Benth., B 2395, Ch
Mimosa hebecarpa Benth., B 1911, Ph
Mimosa nuda Humb. & Bonpl., B 2074, H
Mimosa polycephala Benth., B 2391, Ch
Mimosa radula Benth., B 2452, Ch
Mimosa xanthocentra Mart., B 2114, Ch
Periandra mediterranea (Vell.) Taub., B 2671, Ch
Phaseolus firmulus Mart., B 3488, H
Plathymenia reticulata Benth., B 3977, Ph
Poiretia angustifolia Vogel, B 2386, H
Poiretia latifolia Vogel, B 3007, H
Poiretia longipes Harms, B 2599, H
Pterodon pubescens Benth., B 3833, Ph
Rhynchosia platyphylla Benth., B 2653, H
Senna rugosa (G. Don.) Irwin & Barneby, B 2329, Ph
Senna silvestris (Vell.) Irwin & Barneby, B 2314, Ph
Senna velutina (Vogel) Irwin & Barneby, B 3032, Ph
Stryphnodendron adstringens (Mart.) Coville, B 1985, Ph
Stryphnodendron obovatum Benth., B 2087, Ph
Stylosanthes bracteata Vogel, B 2155, H
Stylosanthes gracilis Kunth, B 2562, Th
Stylosanthes guianensis Sw., B 2423, Th
Stylosanthes scabra Vogel, B 3323, H
Tephrosia adunca Benth., B 2258, H
Vatairea macrocarpa (Benth.) Ducke, B 4032, Ph
Vigna linearis Kunth, B 2838, Li
Zornia latifolia Sm., B 2676, H
Zornia reticulata Sm., B 2481, H
Zornia virgata Moric., B 3142, H
Fabaceae sp. 1, B 2796, Ph

FLACOURTIACEAE

Casearia grandiflora Cambess., B 2078, Ph
Casearia sylvestris Sw., B 2473, Ph
Casearia sp., B 2034, H

GENTIANACEAE

Deianira nervosa Cham. & Schltdl., B 3457, H
Irlbachia alata (Aubl.) Maas, B 2879, H
Irlbachia speciosa (Cham. & Schltdl.) Maas, B 3438, H

GESNERIACEAE

Sinningia elatior (Kunth) Chautems, B 3989, H

HYPOXIDACEAE

Curculigo sp., B 4019, Geo

ICACINACEAE

Emmotum nitens (Benth.) Miers, B 3244, Ph

IRIDACEAE

Sisyrinchium vaginatum Spreng. B 2253, Geo
Trimezia juncifolia (Kl.) Kunth, B 2062, Geo

LAMIACEAE

Eriope crassipes Benth., B 2054, H
Hypenia macrantha (A. St-Hil. ex Benth.) Harley, B 3704, H
Hyptidodendron canum (Pohl ex Benth.) Harley, B 3493, Ph
Hyptis adpressa A. St-Hil. ex Benth., B 4013, H
Hyptis capriariifolia Pohl ex Benth., B 3006, H
Hyptis caudata Epling & Sativa, B 3643, H
Hyptis crinita Benth., B 3334, H
Hyptis desertorum Pohl ex Benth., B 4015, H
Hyptis eriophylla Pohl, B 2849, H
Hyptis ferruginosa Pohl ex Benth., B 3979, H
Hyptis interrupta Pohl ex Benth., B 3076, H
Hyptis lythroides Pohl ex Benth., B 3708, H
Hyptis multiflora Pohl ex Benth., B 2670, H
Hyptis recurvata Poit. B 3535, H
Hyptis saxatilis A. St-Hil. ex Benth., B 3111, Ch
Hyptis villosa Pohl ex Benth., B 2255, H
Hyptis virgata Benth., B 1925, H
Hyptis sp., B 3544, H
Marsypianthes chamaedrys (Vahl) Kuntze, B 2531, H
Marsypianthes montana Benth., B 3108, H
Ocimum sp., B 2151, H
Peltodon pusillus Pohl, B 3271, H
Peltodon tomentosus Pohl, B 3065, H
Salvia sp., B 2100, H

LAURACEAE

Aiouea trinervis Meisn., B 3931, Ph
Cassytha filiformis L., B 2422, VP

LECYTHIDACEAE

Eschweilera nana (O. Berg) Miers, B 2825, Ph

LOGANIACEAE

Strychnos pseudoquina A. St-Hil., B 3943, Ph

LYTHRACEAE

Cuphea carthagenensis (Jacq.) Macbr., B 2179, H
Cuphea linarioides Koehne, B 2136, H
Lafoensia pacari A. St-Hil., B 3782, Ph

MALPIGHIACEAE

Banisteriopsis acerosa (Nied.) B. Gates, B 2809, Ph
Banisteriopsis amplectens B. Gates, B 2429, Li
Banisteriopsis campestris (A. Juss.) Little, B 2346, Li
Banisteriopsis gardneriana (A. Juss.) W. Anderson & Sattl., B 3756, Li
Banisteriopsis laevifolia (A. Juss.) B. Gates, B 2558, Li
Banisteriopsis schizoptera (A. Juss.) B. Gates, B 3049, Li
Banisteriopsis stellaris (Griseb.) B. Gates, B 2479, Li
Banisteriopsis variabilis B. Gates, B 2304, Li
Byrsonima basiloba A. Juss., B 2133, Ph
Byrsonima coccolobifolia A. Juss., B 2233, Ph
Byrsonima crassa Nied., B 1898, Ph
Byrsonima gaultherioides Griseb., B 2898, Ch
Byrsonima guilleminiana A. Juss., B 2044, Ch
Byrsonima intermedia A. Juss., B 2467, Ph
Byrsonima rigida A. Juss., B 2135, Ch
Byrsonima verbascifolia (Griseb.) B. Gates, B 2643, Ph
Camarea affinis A. St-Hil., B 2417, H
Heteropterys anoptera A. Juss., B 3149, Li
Heteropterys byrsonimifolia A. Juss., B 2476, Ph
Heteropterys campestris A. Juss., B 2172, Li
Heteropterys coriacea A. Juss., B 3089, Li
Peixotoa reticulata Griseb., B 2079, Li
Tetrapteris ambigua (A. Juss.) Nied., B 3279, Li

MALVACEAE

Byttneria oblongata Pohl, B 2129, H
Eriotheca gracilipes (K. Schum.) A. Robyns, B 1936, Ph
Eriotheca pubescens (Mart. & Zucc.) A. Robyns, B 3336, Ph
Helicteres sacarolha A. St-Hil., B 2468, H
Krapovichasia macrodon (A. DC.) Fryxell, B 2175, H
Melochia villosa (Mill.) Fawc. & Rendle, B 2499, H
Pavonia rosa-campestris A. St-Hil., B 1962, H
Peltaea edouardii (Hochr.) Krapov. & Cristóbal, B 1940, H
Peltaea polymorpha (A. St-Hil.) Krapov. & Cristóbal, B 2528, H
Pseudobombax longiflorum (Mart. & Zucc.) A. Robyns, B 3507, Ph
Sida cerradoensis Krapov., B 2960, H
Sida cordifolia L., B 2961, H
Sida linearifolia A. St-Hil., B 3051, H
Sida rhombifolia L. *, B 2840, H
Waltheria douradinha A. St-Hil. B 2028, H
Waltheria indica L. *, B 2274, H

MELASTOMATACEAE

Miconia albicans Triana, B 1987, Ph
Miconia fallax A. DC., B 1986, Ph
Miconia ferruginata A. DC., B 1988, Ph
Miconia ligustroides (A. DC.) Naud., B 3465, Ph

Miconia rubiginosa (Bonpl.) A. DC., B 1956, Ph
Mouriri elliptica Mart., B 2131, Ph
Rhynchanthera ursina Naud., B 3536, Ch
Tibouchina gracilis (Bonpl.) Cogn., B 2635, Ch
Tibouchina stenocarpa (A. DC.) Cogn., B 2800, Ph

MENISPERMACEAE
Cissampelos ovalifolia Ruíz & Pav., B 1954, H

MORACEAE
Brosimum gaudichaudii Trècul, B 2109, Ph

MYRISTICACEAE
Virola sebifera Aubl., B 3219, Ph

MYRSINACEAE
Myrsine leuconeura Mart., B 2820, Ph

MYRTACEAE
Campomanesia adamantium (Cambess.) O.Berg, B 1929, Ph
Campomanesia pubescens (A. DC.) O. Berg, B 2226, Ph
Eugenia angustissima O. Berg, B 2413, H
Eugenia aurata O. Berg, B 2699, Ph
Eugenia bimarginata A. DC., B 3502, Ph
Eugenia calycina Cambess., B 2618, Ch
Eugenia complicata O. Berg, B 3583, Ch
Eugenia cristaensis O. Berg, B 2231, H
Eugenia piauhiensis O. Berg, B 2025, Ph
Eugenia piloesis Cambess., B 2511, Ph
Eugenia punicifolia (Kunth) A. DC., B 2265, Ph
Eugenia sp. 1, B 4017, Ch
Eugenia sp. 2, B 3601, Ph
Eugenia sp. 3, B 2237, H
Eugenia sp. 4, B 2923, Ch
Myrcia bella Cambess., B 2127, Ph
Myrcia bracteata O. Berg, B 2673, Ph
Myrcia camapuanensis N.F.E. Silveira, B 1966, Ph
Myrcia crassifolia (O. Berg) Kiaersk., , B 2228, Ph
Myrcia decrescens O. Berg, B 1994, Ph
Myrcia fallax (Rich.) A. DC., B 3689, Ph
Myrcia guianensis A. DC., B 3691, Ph
Myrcia laruotteana Cambess., B 3927, Ph
Myrcia lasiopus O. Berg, B 2689, H
Myrcia linguaeformis Kiaersk., B 3555, Ph
Myrcia rhodeosepala Kiaersk., B 3817, Ph
Myrcia torta A. DC., B 3723, Ch
Myrcia uberavensis O. Berg, B 3561, Ph
Myrcia variabilis Mart. ex A. DC., B 2041, Ph
Myrcia sp. 1, B 2238, Ch
Myrcia sp. 2, B 3260, Ph
Myrcia sp. 3, B 3442, H
Myrciaria delicatula (A. DC.) O. Berg, B 2995, H
Psidium australe Cambess. B 2777, Ch
Psidium cinereum Mart., B 2212, Ch
Psidium firmum O. Berg, B 3848, Ch
Psidium laruotteanum Cambess., B 2250, Ph
Psidium multiflorum Cambess., B 2547, Ch
Psidium rufum Mart. ex A. DC., B 2199, Ph

NYCTAGINACEAE
Guapira campestris (Netto) Lund., B 3969, Ch
Guapira gracilifora (Mart. ex J.A. Schmidt) Lund., B 3929, Ph
Guapira noxia (Netto) Lund., B 3552, Ph
Neea macrophylla Poepp. & Endl., B 3080, Ph
Neea theifera Oerst., B 2110, Ph

OCHNACEAE
Ouratea acuminata (A. DC.) Engl., B 2463, Ph
Ouratea castaneaefolia (A. DC.) Engl., B 3577, Ph
Ouratea floribunda (A. St-Hil.) Engl., B 2219, Ch
Ouratea nana (A. St-Hil.) Engl., B 2462, Ch
Ouratea spectabilis (Mart.) Engl., B 2045, Ph

ORCHIDACEAE
Epistephium sclerophyllum Lindl., B 2830, Geo
Galeandra montana Barb. Rodr., B 2727, Geo
Habenaria brevidens Lindl., B 2811, Geo
Habenaria nasuta Rchb. f. & Warm., B 2751, Geo
Habenaria obtusa Lindl., B 2633, Geo

OXALIDACEAE
Oxalis sellowii Spreng., B 1910, H

PASSIFLORACEAE
Mitostemma brevifilis Gontsch., B 3562, Ch
Passiflora mansoi (Mart.) Mast., B 3066, Li

POACEAE
Actinocladum verticillatum (Nees) McClure ex Soderstrom, B 3837, Ph
Andropogon bicornis L., B 2866, H
Andropogon fastigiatus Sw., B 3157, H
Andropogon leucostachys Kunth, B 1922, H
Andropogon selloanus (Hack.) Hack., B 2614, H
Anthaenantiopsis perforata (Nees) Parodi, B 2344, H
Apoclada arenicola McClure, B 3855, Ph
Aristida longifolia Trin., B 3233, H
Aristida riparia Trin., B 2560, H
Axonopus aureus P. Beauv., B 3017, H
Axonopus barbigerus (Kunth) Hitchc., B 2763, H
Axonopus brasiliensis (Spr.) Kuhlm., B 2890, H
Axonopus derbyanus Black, B 2291, H
Brachiaria decumbens Stapf *, B 2311, H

Ctenium chapadense (Trin.) Doell., B 3420, H
Echinolaena inflexa (Poir.) Chase, B 2382, H
Elionurus latiflorus Nees, B 3770, H
Eragrostis articulata (Schrank) Nees, B 2556, Th
Eragrostis maypurensis (Kunth) Steud., B 2170, Th
Gymnopogon foliosus (Willd.) Nees, B 3083, H
Hyparrhenia bracteata (Humb. & Bonpl.) Stapf, B 3833, H
Hyparrhenia rufa (Nees) Stapf *, B 3181, H
Ichnanthus procurrens (Nees) Sw., B 2561, H
Leptocoryphium lanatum (Kunth) Nees, B 3700, H
Loudetiopsis chrysothryx (Nees) Conert, B 2845, H
Melinis minutiflora P. Beauv. *, B 2278, H
Olyra taquara Sw., B 3949, Ph
Panicum olyroides Kunth, B 1928, H
Panicum rudgei Roem. & Shult., B 2491, H
Panicum sp., B 2969, H
Paspalum carinatum Humb. & Bonpl. ex Fleug., B 2002, H
Paspalum convexum Humb. & Bonpl. ex Fleug., B 2972, H
Paspalum erianthum Nees, B 2405, H
Paspalum gardnerianum Nees, B 2354, H
Paspalum geminiflorum Steud., B 3250, H
Paspalum malacophyllum Trin., B 3050, H
Paspalum multicaule Poir., B 3168, H
Paspalum pectinatum Nees, B 2343, H
Paspalum sp. 1, B 3060, H
Paspalum sp. 2, B 2938, H
Pennisetum setosum (Sw.) L. C. Rich. *, 3363, H
Rhynchelytrum repens (Nees) C.E. Hubb. *, B 2572, Th
Schizachyrium condensatum (Kunth) Nees, B 3430, H
Setaria geniculata (L.) P. Beauv. *, B 2495, Th
Sporobolus acuminatus Boechat & Longhi-Wagner, B 2181, H
Sporobolus ciliatus (Trin.) Hack., B 2986, H
Sporobolus indicus (L.) R. Brown, B 2519, H
Sporobolus tenuissimus (Schrank) Kuntze, B 2178, T
Thrasya petrosa Nees, B 2630, H
Tristachya leiostachya Nees, B 2269, H

POLYGALACEAE

Polygala angulata A. DC., B 2425, H
Polygala aphylla A.W. Benn., B 3910, H
Polygala opina Wurdack, B 2223, H
Polygala violacea Aubl., B 2492, H
Securidaca tomentosa A. St-Hil., B 3547, Li

POLYGONACEAE

Coccoloba densifions Mart. ex Meisn., B 2111, Ph

POLYPODIACEAE

Adiantum serratodentatum Humb. & Bonpl. ex Willd., B 3403, H

PROTEACEAE

Roupala montana Aubl., B 2144, Ph

RHAMNACEAE

Crumenaria polygaloides Reissek, B 2920, H

RUBIACEAE

Alibertia sessilis (Vell.) K. Schum., B 2108, Ch
Borreria suaveolens Meyers, B 1914, H
Chomelia ribesioides Benth. ex A. Gray, B 3928, Ph
Declieuxia fruticosa (Willd.) Kuntze, B 2138, H
Declieuxia oenanthoides Schult. & Schult., B 2040, H
Declieuxia verticillata Müll. Arg., B 2245, H
Diodia schumannii Standl., B 1972, Th
Diodia teres Walt., B 2524, Th
Galianthe grandifolia E.L. Cabral, B 2944, H
Genipa americana L., B 2449, Ph
Palicourea coriacea (Cham.) K. Schum., B 1903, Ch
Palicourea rigida Kunth, B 1941, Ph
Richardia humistrata (Cham. & Schltdl.) Steud., B 1909, H
Richardia stellaris (Cham. & Schltdl.) Steud., B 3036, H
Sipanea hispida Benth., B 2485, H
Tocoyena formosa (Cham. & Schltdl.) K. Schum., B 2124, Ph

RUTACEAE

Hortia brasiliensis Vand. ex A. DC., B 2765, Ph
Spiranthera odoratissima A. St-Hil., B 2073, Ch

SAPINDACEAE

Matayba guianensis Aubl., B 3925, Ph
Serjania cissoides Radlk., B 1993, Li
Serjania erecta Radlk., B 2128, Ch
Serjania reticulata Cambess., B 3040, Li
Talisia angustifolia Radlk., B 1935, Ch
Toulicia tomentosa Radlk., B 3088, Ch

SAPOTACEAE

Pouteria ramiflora (Mart.) Radlk., B 1984, Ph
Pouteria subcaerulea Pierre ex Dubard, B 1899, Ch
Pouteria torta (Mart.) Radlk., B 1918, Ph
Pradosia brevipes (Pierre) Penn., B 3772, H

SCROPHULARIACEAE

Buchnera lavandulacea Cham. & Schltdl., B 2437, H

Esterhazya petiolata Barr., B 3358, H
Scoparia dulcis L.*, B 2486, Ch

SIMAROUBACEAE
Simaba suffruticosa Engl., B 3730, Ch
Simarouba amara Aubl., B 3802, Ph

SMILACACEAE
Smilax cissoides Mart. ex Griseb., B 2330, Li

SOLANACEAE
Solanum lycocarpum A. St-Hil., B 2020, Ph
Solanum subumbellatum Vell., B 4005, Ch

STYRACACEAE
Styrax ferrugineum Nees & Mart., B 3227, Ph

TURNERACEAE
Piriqueta emasensis Arbo, sp. nov., B 1968, H
Piriqueta sidifolia (Cambess.) Urban, B 3059, Ch
Turnera purpurascens Arbo, B 2359, H

VERBENACEAE
Aegiphila lanata Mold., B 2303, Ch
Aegiphila lhotzkiana Cham., B 2315, Ph
Amasonia hirta Benth., B 2385, H
Casselia chamaedryfolia Cham., B 2066, H
Lippia hirta Schauer, B 2415, Ch
Lippia hoehnei Mold., B 3690, Ch
Lippia lupulina Cham., B 3642, Ch
Lippia martiana Schauer, B 2254, Ch
Lippia primulina S. Moore, B 3966, H
Lippia stachyoides Cham., B 2257, H
Lippia turnerifolia Cham., B 2505, H
Stachytarpheta maximilliani Schauer, B 2401, H
Stachytarpheta simplex Hayek, B 2369, H

VIOLACEAE
Hybanthus poaya (A. St-Hil) Baill., B 3947, H
Hybanthus sp. nov., B 3513, H

VITACEAE
Cissus erosa L.C. Rich, B 2458, Li

VOCHYSIACEAE
Qualea grandiflora Mart., B 2065, Ph
Qualea multiflora Mart., B 2434, Ph
Qualea parviflora Mart., B 3952, Ph
Vochysia thyrsoidea Pohl, B 2892, Ph
Vochysia tucanorum Mart., B 2496, Ph

Unknown
Unknown sp. 1, B 2305, Ch

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