

HOW RICH IS THE FLORA OF BRAZILIAN CERRADOS?¹

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ABSTRACT

An attempt is made to summarize what is known about the richness of the total terrestrial angiosperm flora of the "cerrados" (as a complex of formations) in Brazil, based on published surveys and species lists. A "refined" list of arboreal and shrubby species was compiled from a total of 145 individual lists from 78 localities, taking into account synonymy and recent taxonomic changes. The refined list had 1709 references to taxonomic entities at the species level (973 identified with confidence and 31 with *aff.* or *cf.*), 572 references to generic entities (363 genera identified with confidence), and 210 references to the family level (88 families identified with confidence). There are many unidentified arboreal and shrubby taxa at the specific, generic, and family levels, indicating that a considerable amount of taxonomic research remains to be done on the cerrado flora, and that this flora may be much richer than is generally assumed. Depending on the assumptions made, these data suggest a total of around 1000 to 2000 arboreal and shrubby species and 2000 to 5000 herbaceous ones, yielding estimates for the total cerrado flora (terrestrial angiosperms) ranging from 3000 to 7000 species. These limits, especially the upper one, are dubious, but give an idea of the magnitude of the angiosperm flora in the Brazilian cerrados. Surveys of cerrados are very unevenly distributed, and studies of relatively unknown sites may reveal much more diversity than that presently known.

On reading accounts of floristic studies on cerrados in Brazil, one rapidly comes to realize that the majority of authors, either implicitly or explicitly, consider the cerrado flora to be well known and to have low richness. For example, Rizzini (1963, 1971) estimated around 600 species and a little over 200 genera for the whole cerrado arboreal and shrubby flora, but Heringer et al. (1977) cited 193 arboreal and shrubby species and confirmed less than 150 genera. Even recent studies (e.g., Leitão Filho, 1992; Ratter et al., 1997) have estimated the number of arboreal-shrubby species for the cerrados as being around 800. Eiten (1990) has been one of the few authors to suggest that the thick-stemmed arboreal-shrubby flora contains more than 1000 species and that the denser physiognomies may reach more than 150 arboreal and shrubby species per hectare. Castro (1994; see Ratter et al., 1997) made an extensive survey of the literature in order to gather support for the idea that the arboreal and shrubby flora of the Brazilian cerrados is much richer than previously assumed.

It could be argued that as the cerrados consist of physiognomies that are predominantly grasslands, the greatest floristic richness should be encountered in the non-woody (herbaceous-subshrubby) component of the vegetation. Surveys of this

component have been rare in Brazil (Mantovani & Martins, 1993). Comparing the non-woody component in different localities in Brazil, Mantovani (1983) found a local richness that varied between 165 species in the Serra Dourada (state of Goiás) and 640 in the municipality of Lagoa Santa (state of Minas Gerais). In an area of 343.42 ha of a cerrado in the Reserva Biológica de Moji Guaçu (state of São Paulo), Mantovani and Martins (1993) found 403 species of non-woody angiosperms. The herbaceous-subshrubby angiosperm flora of the cerrados therefore appears to be richer than the arboreal-shrubby flora, but its richness varies with physiognomy (Mantovani, 1987).

It can also be argued that the maximum physiognomic and floristic expression, together with maximum spatial continuity, should occur in the "nuclear" (Labouriau, 1966), "central" (Rizzini, 1963), or "core" (Eiten, 1972; Ferri, 1977a) areas. An implication of this reasoning is that marginal and disjunct areas (Ratter et al., 1988a) should have a relatively impoverished flora in comparison to the nuclear area, although they may be supplemented by floristic elements from the surrounding vegetation formations (Eiten, 1972; Fernandes & Bezerra, 1990; Rizzini, 1963). These elements, which occur preferentially in other formations and

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sporadically in cerrados, were called "accessory" species or elements by Rizzini (1963). Species that occur exclusively in cerrado formations, or show a marked preference for cerrados, were termed "characteristic" species ("espécies peculiares ou próprias") by Rizzini (1963). He considered that only the woody species occurring in the "cerradão" (forest physiognomy) could be designated characteristic species, that is, essentially the arboreal-shrubby species. However, because of a large number of accessory species (*sensu* Rizzini, 1963), marginal and disjunct cerrado areas generally show considerable floristic richness.

Although this might suggest that cerrados in marginal or disjunct areas should gradually grade into other formations, they are usually fairly easily distinguished from other formations in the neighborhood by their physiognomy and floristic composition, often with a number of common well-known species. The fact that a species occurs, grows, and reproduces successfully in an area shows that it is adapted to the local conditions. It is possible to construct a *continuum* of species ranging from those restricted to very local areas within a single vegetation type to those that are very widespread and occur in several different formations. The distinction between "characteristic" and "accessory" species therefore seems rather artificial and debatable, lacking in ecological significance. The spatial and temporal abundance of the different species also cannot be ignored. While it might be argued that a species typical of other formations and occurring only sporadically in cerrados should be considered an accessory species (e.g., *Ficus* spp.), it is possible to find examples of species that occur with very low abundance but only in cerrado areas (such as *Eugenia aurata*), along with numerous intermediate situations (such as *Copaifera langsdorffii* or *Vochysia tucanorum*) in which species that are common in other formations also occur in some abundance in many cerrados. Once again, it is virtually impossible to find a clear distinction between "accessory" and "characteristic" species. Most floristic studies, moreover, do not include information on abundance, making it difficult to use this criterion.

Although cerrados are among the best studied vegetation types in Brazil, a number of fundamental questions remain unanswered. Just how rich, floristically, is the cerrado? How many and which taxa are already known? What is the proportion of still unknown/unidentified/undescribed taxa? What are the taxa that cause most problems for identification? In addition, knowledge of the flora of a given type of vegetation depends fundamentally on col-

lections in the field. Which areas have been well collected? To what extent have collections been widely spread or have they concentrated in certain areas? In which regions are collections sparse or nonexistent? These represent priority areas for future work and should be clearly identified.

Answers to these questions are essential for any attempt to establish plans for conservation and further investigation of the cerrado vegetation, tasks which are, sadly, increasingly urgent given the rapid destruction and exploitation of this vegetation type in Brazil today.

In the present study we tried to summarize what is known from floristic studies in the cerrados of Brazil, at least for the arboreal-shrubby component of the vegetation, and to provide some indications of where further work might most usefully be invested to improve our knowledge for conservation and rational sustainable exploitation.

MATERIAL AND METHODS

This study was based on material published and theses defended up to 1992, supplemented by 12 unpublished field surveys from the states of Piauí and São Paulo (Castro et al., *in press*). A literature survey uncovered 135 publications and theses that included floristic surveys of cerrados. Of these, 92 were selected for the present study. It is likely that other studies exist, but they were not localized or could not be obtained.

An initial survey was based on Garcia et al. (1981), Huber (1974), Lemos (1976), Pinto (1979), and Silva (1982), together with publications by Eiten (1972), Ferri (1963, 1971, 1973, 1977b, 1979), Goodland (1979), Labouriau (1966), Marchetti (1988), and Marchetti and Machado (1982). A second survey was based on the citations in these publications and on theses defended, as well as on the literature cited in them. In many cases, the authors contacted supplied complementary information in the form of extended species lists and revised identifications. Surveys were selected based on the following criteria:

- (1) Where the authors designated the vegetation surveyed as some type of "cerrado."
- (2) Where the authors distinguished the growth form of the species surveyed. We consider only trees and shrubs; other growth forms were excluded.
- (3) When the publication omitted growth form, the authors were contacted and they sent us their field observations. In some cases, indications in the literature were used (Ferri, 1969, 1977b; Heringer et al., 1977; Martius et al., 1840,

1906; Rizzini, 1963, 1971). In a few cases, growth forms were designated based on the field experience of the authors themselves.

- (4) Only surveys that made periodic collections or quantitative sampling in a limited area at a given locality were included. We excluded lists based on single or sporadic visits, or that were not relatively localized.

According to Coutinho (1990), different vegetation types are included under the word "cerrados," whose physiognomies vary from pure grassland ("campo limpo de cerrado"), through savanna ("campo sujo," "campo cerrado," "cerrado sensu stricto," in order of growing woody biomass), to pure forest ("cerradão"). A similar concept of the cerrados can be found in Castro (1996), Eiten (1972), Ratter and Dargie (1992), and Ratter et al. (1996, 1997). They are classified in the world biome of savannas, which occur between the tropics, on dystrophic, allic or acid, deep, heavily intemperized soils under a seasonal climate where recurrent fires are normal events (Sarmiento, 1983). We accept the broad concept of cerrados as a complex of different vegetation formations, and in the present study we accepted the classification of the vegetation surveyed as some type of cerrado by the author of the survey, as stated in criterion 1 above.

The cerrados show two distinct floras, termed "silvestre" (from the Latin *sylva* = forest) and "campestre" (from the Latin *campus* = field) by Rizzini (1963, 1971), mutually exclusive because both are heliophilous (Coutinho, 1990). In the physiognomies of the cerrados they constitute roughly the woody layer and the ground layer, respectively, in Eiten's (1972) terminology. The dominant life forms in the woody layer are arboreal phanerophytes (here called trees) and shrubby chamaephytes (here called shrubs). In the ground layer the dominant life forms are subshrubby chamaephytes (here called subshrubs), hemicryptophytes (the dominant life form), and geophytes (here called herbs) and all qualified as non-woody. A key for plant life-forms can be found in Mueller-Dombois and Ellenberg (1974). We use the term "woody" to include trees and shrubs and apply the qualifier "woody" according to the appearance of the aerial system of a dicotyledonous plant: all that can be seen of a plant in a normal survey. A woody plant has at least one orthotropic stem axis arising from the soil that, along some extension from its base, is hard, relatively thick, and has a bark (not a thin, green epidermis). Most quantitative surveys in Brazilian cerrados have sampled woody plants with a minimum stem diameter of 3 cm at ground level.

To categorize species belonging to the "silvestre" or "campestre" floras we use here the expressions arboreal-shrubby and subshrubby-herbaceous components. We prefer to use the word "component" because it is abstract and not so concrete as "layer," which has a well-defined meaning in physiognomy: a layer can be seen in the vegetation, but not in a flora.

In several cases, more than one species list was presented for a given site, since a number of adjacent areas had been studied, thus resulting in 145 floristic lists for 78 sites. A preliminary list of identified species and those with dubious identification was prepared. Dubious identifications included those such as *aff.* or *cf.* Unidentified taxa were those unknown at species, genus, or family levels. From this preliminary list, a refined list was prepared where synonyms were combined under a single epithet, based on the taxonomic literature (floras, revisions, theses, etc.). No attempt was made to ensure that the epithet chosen was taxonomically up to date, but only to make sure that different binomials belonging to the same species were included under a single name, although wherever possible, the nomenclature used in the most recent revision was followed.

Calculations of proportions of dubious and unknown taxa were based on the refined list. Each unidentified taxon was considered to be different among samples; that is, unknown taxa identified to a given genus or family were considered to be different if they occurred in different surveys, so that if *Myrcia* sp. appeared in two lists, the final list contained *Myrcia* sp1 and *Myrcia* sp2. In the same way, any plant unknown in one survey was considered to be a different taxon from the unknowns occurring in other surveys. Dubious binomials were considered to be different among themselves and were also considered to be different from confident identifications. Intraspecific taxa were treated as separate taxa. All these were taken as references to taxonomic entities at the species (or genus or family) level, and not as "true" different species (or genera or families) in themselves, in order to estimate lower and upper limits for the richness of the flora. We used this method of calculating the number of taxonomic entities for operational facility and greater objectivity. Nevertheless, since it was impossible to know whether the unidentified, unknown, or dubious entities represented the same or different taxa in different lists, by adopting this procedure we introduced an overestimation of the upper limit of the cerrado floristic richness.

The surveys included in the present study are listed in Table 1 (pp. 204–212), which shows the

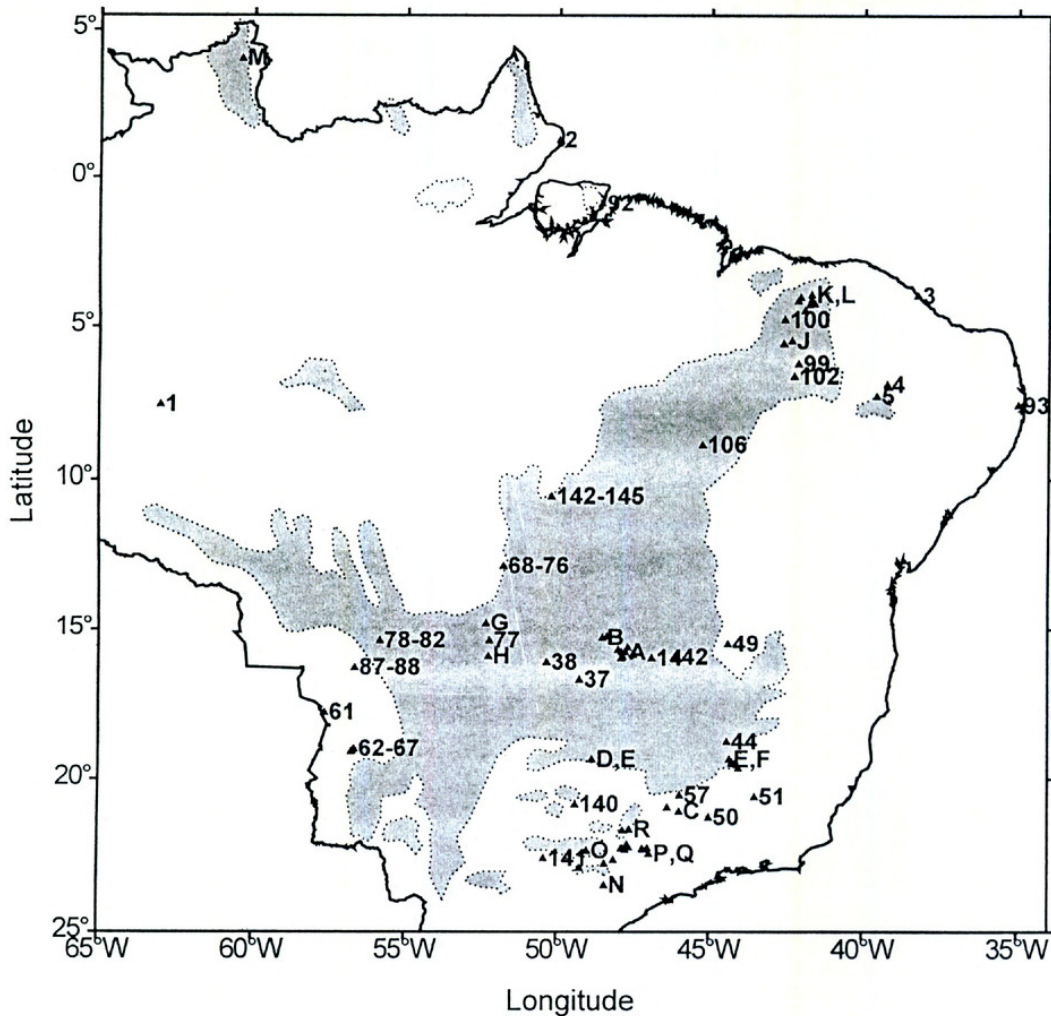


Figure 1. Cerrado vegetation sites included in the present survey. The dotted area represents the approximate distribution of cerrado vegetation in Brazil. Numbers and letters on the map correspond to municipalities where the surveys were done. See Table 1 for number code. The letters represent the following lists: A 6–36; B 39, 40; C 41–43; D 45–48; E 52–56; F 58–60; G 83–86; H 89–91; J 97, 101; K 94–96, 98; L 103–105; M 107–109; N 110–118; O 119, 120; P 121–132, 138; Q 134–137; R 133, 139.

sites surveyed, the municipality where they are located, their geographical location, and the author of the survey.

The distribution map (Fig. 1) showing the nuclear and disjunct cerrados was adapted from Fernandes and Bezerra (1990), Ferri (1977b, 1979), Malavolta and Klieman (1985), Ogata (1986), and Wagner (1986). It also shows the localization of the municipalities in which the surveys included in the present study were done.

RESULTS

The refined list (Table 2, pp. 213–223) indicates a total of 210 references to taxonomic entities at the family level, 572 references to the genus level, and 1709 references to the species and subspecies levels, including dubious identifications and non-identified material. Of the 210 references to taxa at the family level, 122 could not be identified by the

authors of the original studies. They are here called “unknowns,” representing 58.1% of the total. This would indicate that the number of families lies between 88 (the number of families definitely identified) and 210 (if none of the unknowns could be attributed to a family already identified). Of the 572 references to taxonomic entities at the generic level, 363 were identified, but 209 were not. These “unknowns” at the generic level represent 36.5% of the total. From the 1709 references to taxonomic entities at the species level, there are only 973 identified with confidence, 31 with dubious identifications, 36 with dubious identifications where the same species had already been identified in other sites, and a further 5 infraspecific taxa that belonged to species already included without indications of infraspecific categories. Also from the total 1709 references, 455 were identified to the generic level only, and 209 remained “unknown”

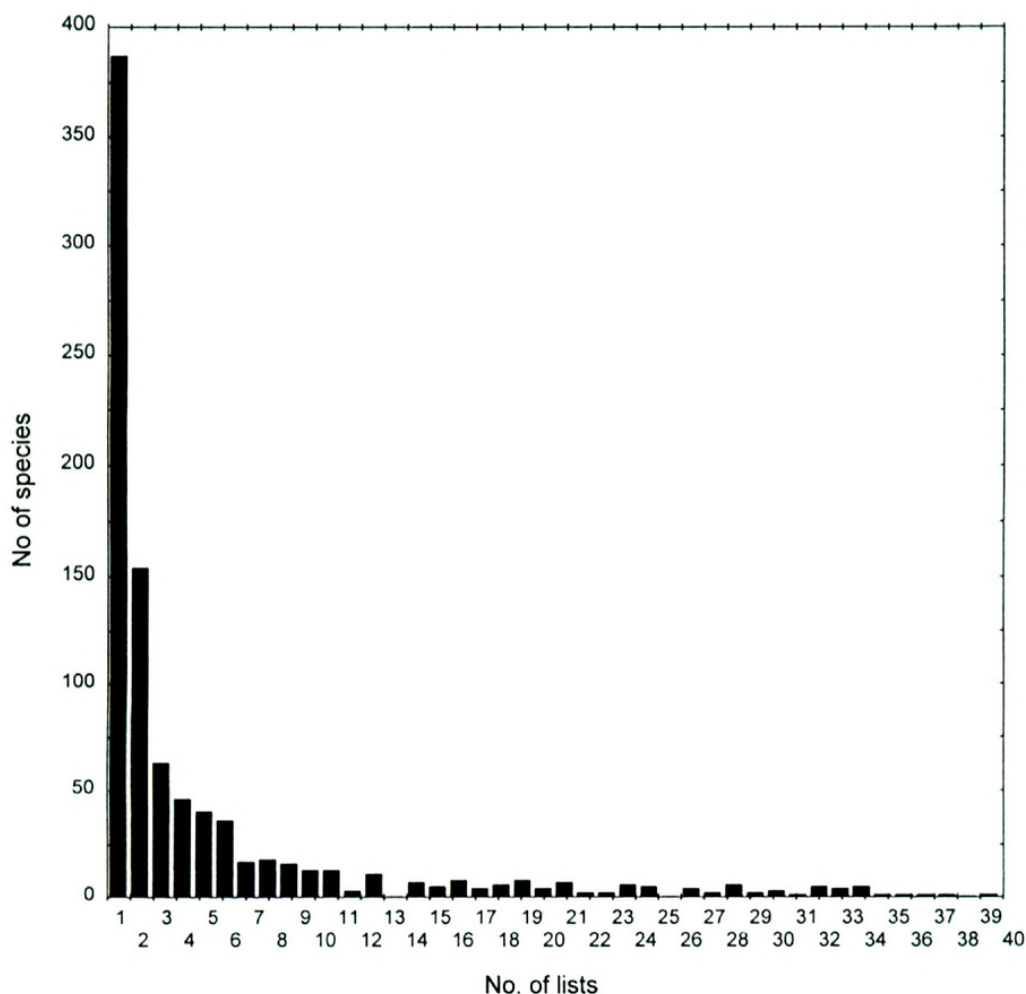


Figure 2. Frequency distribution of confidently identified species of arboreal and shrubby plants of Brazilian cerrados according to the number of lists in which they were recorded.

at the generic level (of these, 122 are references only to the family level). These results are summarized in Table 3 (p. 224).

Of the well-identified species, 387 (39%) occurred in a single list, while species with two occurrences made up a further 16%. This means that more than half of the species were present in less than 3 out of 145 lists. Figure 2 shows the frequency distribution of species according to the number of sites at which they were recorded.

DISCUSSION

It is difficult to obtain a reliable estimate of the number of arboreal-shrubby taxa occurring in the cerrado, since a large number of factors may inflate or diminish the total obtained. In spite of this, we can arrive at two distinct estimates, with variable degrees of reliability: (1) an *upper limit* represented by the list taken as it stands, assuming that all of the references to taxonomic entities are new to the list and represent species, genera, or families not previously identified; (2) a *lower limit*, which as-

sumes that all of the unknowns are in fact taxa that have already been recorded and that there remain no more taxa to be added beyond the ones already identified. The assumptions for both of these estimates are highly implausible, especially for the upper limit, but they provide a means of establishing probable upper and lower limits. The numbers implied by both of these limits are shown in Table 4 (p. 224).

The lower limit would seem to offer a reasonably secure minimum estimate for the arboreal-shrubby cerrado flora of around 1000 species, 370 genera, and 90 families. Three main objections might be raised: (1) The list includes a number of species that certainly would not be regarded as typical cerrado species (e.g., *Talauma ovata*). (2) A number of species that are not typically woody in most sites are also included (e.g., *Oxalis*). (3) Some unrecorded rarer species are likely to be "hidden" in this list, having been misidentified as common cerrado species.

The question of "non-cerrado" species is very

difficult to resolve. As mentioned in the introduction, we have taken the position that if a species has been recorded in some form of cerrado vegetation, it should be included here, since we feel that it is almost impossible to supply a consistent criterion to distinguish Rizzini's "accessory species."

The second objection is the question of how to define "woody" forms. This is also practically impossible, since again there is no hard and fast criterion that can be applied universally, and authors differ considerably in the concepts that they utilize. A number of species also vary considerably in habit and may range from small, virtually herbaceous forms up to quite large trees in different cerrado sites (e.g., *Andira*, *Caryocar*, *Cochlospermum*), so that a species that is clearly woody and included in a survey of woody species in one site may be excluded in another. In all of the species listed, at least one author considered the species to be a shrub or tree in the site where he made his survey, and in many cases this information was confirmed by personal contacts with the author of the publication.

The final objection is almost impossible to quantify. The proportion of rarer species that have been confused with common cerrado species is likely to vary widely with the experience and thoroughness of the researchers who carry out a survey and the degree to which the flora of the region being studied is more or less well known. The availability of recent revisions and more easily accessible literature will also have a strong influence, and this will tend to be unequal among different taxonomic groups.

The upper limit for the cerrado woody flora is much more debatable. It is obviously unrealistic to assume that all of the unknowns represent "new" taxa (taxa not included in the lists; these are not new species from the taxonomic viewpoint), so that the number given here would tend to overestimate the number of taxa in the cerrado woody flora quite considerably. This is most evident in the number of families: it is highly unlikely that many of the unknowns at the family level do, in fact, represent "new" families. Once again, the proportion of "new" species is likely to vary widely, depending on the region where the survey was made. In relatively well-known cerrado areas such as the Distrito Federal, the state of São Paulo, and the southern part of the state of Minas Gerais, the cerrado woody flora is quite well known, and it is improbable that a large number of "new" species will be added, at least for the woody component. In less well-known regions such as northern Mato Grosso state and northern Minas Gerais, however, this pro-

portion could be much higher. We have no reliable estimate of what proportion of the unknowns represents "new" species. It might be possible to estimate this by sampling and re-examining the unknowns from a number of surveys for taxonomic groups where recent revisions or expert taxonomic assistance are available. This is very difficult, however, since most publications do not cite voucher specimens, which would allow the unidentified material to be refound. We recommend that, in future studies, voucher specimens be deposited and cited for *all* species, even where only vegetative material is available.

Although the upper limit given here is likely to represent a gross overestimate of the number of cerrado woody species, it is necessary to be somewhat cautious before discarding this estimate completely. Any sampling scheme is certain to miss a number of species in a given area. For example, Gibbs et al. (1980) estimated that in a relatively restricted area of riparian forest, sampling by quadrats or point-centered quarters missed approximately 20% of the species present. This percentage is likely to be rather lower in cerrado—Ratter et al. (1988a) found that only about 5% of the woody species were not included in a quadrat survey in São Paulo state—but it is very unpredictable and likely to vary widely with sample size and local richness. A preliminary study of data from quantitative surveys (Castro, 1994) suggested that at least 1000 individuals should be included to give a reasonable representation of the woody flora of a given locality. Surveys that do not sample quantitatively frequently miss less conspicuous species, unless the survey is very thorough and visits are repeated in different seasons. In a number of cases, our field experience has shown that a quantitative sampling scheme (with statistical planning) will bring to light a much larger number of species than a series of sporadic visits. It might be argued that even if one survey misses a number of species, the repeated sampling by different studies should be enough to ensure an almost complete species list. This argument, however, supposes that the vegetation is relatively uniform. Comparison of different areas has shown that composition may vary widely, even between cerrado areas that are geographically close (Castro, 1994; Ratter et al., 1988a, b, 1996, 1997, Ratter & Dargie, 1992, and citations of A. A. J. F. Castro therein), and that many species have very sporadic or patchy distributions. It has also become clear that more intensive studies of even relatively well known areas and well known groups are still uncovering a surprising number of new species (Pereira et al., 1993). Besides these arguments, the

map in Figure 1 clearly shows that sampling has been uneven, with an enormous concentration of surveys in relatively few well-studied areas, while large and potentially interesting and heterogeneous regions have remained unsampled. Even in comparatively well-worked states such as São Paulo and Minas Gerais, the distribution of cerrado surveys has been uneven. Surveys in these areas would almost certainly contribute a considerable number of "new" species to the list. In consequence, it seems premature to declare that the upper limit given in Table 2 is totally wrong, and it is possible that the cerrado flora could have a much greater number of woody species than that established as the lower limit.

We are left, therefore, with a range of around 1000 to 2000 for the number of woody species in the cerrado flora. Comparing the lower limit with estimates in the literature, it can be seen that this is somewhat higher than those proposed by most authors, but is quite close to Eiten's (1990) value. Our upper limit is considerably higher than any of the published estimates, and is more than double the number of woody cerrado species that most authors have assumed. Although we consider this upper limit rather unlikely, it suggests that the cerrado woody flora may be much richer than has usually been indicated and that much work is still necessary, particularly in under-sampled regions, to reach a more satisfactory conclusion.

The almost complete absence of studies of the herbaceous-subshrubby component of the cerrado flora means that it is not possible, at present, to make comprehensive lists of species. Mantovani and Martins (1993) have found proportions of 1:2 to 1:3 for the number of arboreal-shrubby species: herbaceous-subshrubby species. Extrapolation from these ratios gives the results found in Table 5 (p. 224), which shows the estimated number of herbaceous-subshrubby species under various assumptions. The number of herbaceous-subshrubby species would therefore lie between 2000 and 5250, with the total cerrado flora of 3000 to 7000 angiosperm species. These numbers are clearly not very reliable, since we have insufficient knowledge of the ratio of woody : non-woody species, but they do at least suggest an order of magnitude. In general, it seems likely that the proportion of confidently identified species is lower in studies of the non-woody flora of the cerrado (Mantovani, 1983), so that the percentage of "new" species among the unknowns may be much higher in this group.

Because the spatial distribution of the surveys in the cerrados in Brazil has been very uneven (Fig. 1), a number of areas merit high priority for future

investigations. Among these we particularly emphasize the following:

- (1) The state of Mato Grosso do Sul has extensive areas of cerrado outside the pantanal region, which is the only part to have been studied. This region is particularly vulnerable, since large areas have already been cleared for agriculture. The neighboring cerrados in the southeast of Goiás are also unstudied and extremely vulnerable.
- (2) Northwestern Mato Grosso state has also been very little studied and is being rapidly opened up to colonization.
- (3) The state of Tocantins (formerly north of Goiás) and adjoining areas in Ceará are practically untouched and almost nothing has been published about these areas. They are likely to be particularly interesting, since they are in contact with the forests of the Amazon basin and are likely to show high diversity in common with sites in Mato Grosso, which have provided the highest species richness encountered in the cerrado flora (Castro, 1994).
- (4) The west of Bahia and south of Piauí also have considerable areas of cerrado that have scarcely been studied. These offer the opposite extreme from the previous region, since they come into contact with the caatinga vegetation and are likely to contain a number of unique elements adapted to drier climates (Castro et al., in press).

CONCLUSIONS

The greatest source of error and uncertainty in compilation of lists of the cerrado flora is the relatively large number of "unknowns," together with the uneven geographic distribution of the studies that have been made. The unknowns and dubious identifications in the present list amount to more than 40% at the species level. Although this percentage must contain many "unknowns" that are in fact known species that were not identified as such when the survey was made, and must also contain many species that are common to several sites, there is still a sizeable residue that represents genuinely new species or species that have not been correctly identified as occurring in cerrado vegetation. There is clearly still a need for much taxonomic work on the cerrado flora.

Good taxonomy depends on good collecting, and it is clear that much work remains to be done in the cerrados. On the one hand, typical floristic studies tend to collect flowering material, which can usually be identified to species level with confi-

dence, but will often tend to miss species that were not in flower at the times visits were made, that tend to flower sporadically or rarely, that are very ephemeral, or are relatively inconspicuous. On the other hand, quantitative studies on community structure often collect more completely, since all the individuals within certain size classes will be included, but much of the material may be sterile or atypical (attacked by herbivores, etc.). Thorough collecting and complete identification of material therefore require repeated visits to a site, making the whole exercise time-consuming and costly, particularly in more remote areas where access is difficult and considerable time may be spent in traveling to the site. This problem is more acute with herbaceous-subshrubby species, where the problems mentioned above are even more serious. In many areas the accelerated rates of destruction of cerrado areas mean that it is very difficult, if not impossible, to make a number of return visits to a site, since it may have been destroyed or heavily altered in the meantime.

A further source of difficulties in the compilation of species lists is the problem of updating identifications. In most cases, once a survey has been published, no attempt is made to update the species lists or publish corrections where erroneous identifications have been made. Since many surveys do not cite individual voucher specimens, it can often be impossible to relocate the material collected in order to check identifications or try to resolve unidentified material. In the case of a list like the present one, even if the voucher lists were published, verifying them would involve consulting dozens of herbaria. The collections in a herbarium may have been recently reworked by a specialist, but the new identifications that have been made are generally not easily accessible. This is one area where the use of data banks and on-line access to collections would be genuinely useful, rather than just a fashionable thing to do in order to say that the herbarium is "up-to-date." If it were possible to consult herbaria on line and discover whether specific specimens cited in published reports have been reidentified, many of the difficulties and errors in the compilation of the present list would be avoidable. We therefore urge that more attention be given to publishing corrections and additions to already published species lists or quantitative surveys, and that efforts be made to extend and facilitate the use of computer data banks and on-line access to collections.

In the Brazilian Constitution, the vegetation formations of the Amazon, the Atlantic Forest, coastal areas, and the pantanal of Mato Grosso are consid-

ered to be a national heritage. Riparian forest is also the subject of special legislation. This implies that different categories of ecosystems have been recognized and that the formations cited above are considered to be of greater importance, while the remaining vegetation formations are not. Among the latter, the cerrado is being destroyed most rapidly. In addition, historically the cerrados have never been considered deserving of specific conservation measures, and there are few official cerrado reserves. Contrary to the assumptions made by many authors, however, the cerrados do have a relatively rich and diverse flora, which is still relatively under-investigated.

The cerrado has species that evolved under conditions of strong selective pressures from herbivores (Fowler & Duarte, 1991; Oliveira & Leitão Filho, 1987). Moreover, they are adapted to dystrophic, acid, often aluminum-rich soils, and are resistant to (often prolonged) periodic drought. As such, they represent an important genetic resource and are much more than a simple source of vegetable charcoal or areas to be exploited for cultivation of crops, often stimulated more by economic interests than any real necessity. Their protection, and the preservation of the genetic diversity that they contain, is a matter of considerable importance and urgency.

Any attempt to create a rational scheme for preservation of cerrados and to identify particularly critical areas for conservation is hampered by our incomplete knowledge of the flora as a whole and by the uneven coverage of studies in the vast region originally covered by this vegetation. We are still unable to determine what would be a sufficient size of reserve to maintain a reasonable level of cerrado biodiversity, or even to state with any confidence what is a reasonable level of biodiversity for this formation.

A potentially valuable resource that is still relatively unknown is now being subjected to increasing levels of genetic erosion and is not being exploited in a rational or wise manner. We therefore urge that increased efforts be made to improve our knowledge of the cerrado flora as a whole, both in terms of basic taxonomy and in improving the geographic coverage of cerrado studies.

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Table 1. Selected surveys of cerrado sensu lato in Brazil and their authors. In the column "Authors," when not indicated, the authors are the same as above. Map Code: locality of the municipality on the map of Figure 1. State: AM Amazonas, AP Amapá, CE Ceará, DF Distrito Federal, GO Goiás, MG Minas Gerais, MS Mato Grosso do Sul, MT Mato Grosso, PA Pará, PE Pernambuco, PI Piauí, RR Roraima, SP São Paulo, TO Tocantins. Altitude in meters. (a) no information.

Map Code	State	Municipality	Sites	Latitude S	Longitude W	Altitude	Authors
1	AM	Humaitá	Puciani-Humaitá	7°31'	63°00'	51	Gottsberger and Morawetz (1986)
2	AP	(a)	Macapá e Calçoene	1°17' N	50°00'	13	Rabelo and Berg (1982)
3	CE	Aquiraz	(a)	3°58'	38°16'	35	Granjeiro (1983)
4	CE	Aurora, Caririaçu, Farias Brito, Granjeiro, Lavras da Mangabeira e Várzea Alegre	(a)	6°52'	39°15'	440	Figueiredo (1989a, b), Figueiredo and Fernandes (1987)
5	CE	Crato, Nova Olinda e Santana do Cariri	Chapada do Araripe	7°15'	39°35'	871	Albuquerque (1987)
6(A)	DF	Brasília	Fazenda Água Limpa	15°57'	46°53'	1100	Moura (1983)
7(A)	DF	Brasília	Fazenda Água Limpa	15°57'	46°53'	1100	Ratter (1980, 1985 ^a , 1986)
8(A)	DF	Brasília	Fazenda Água Limpa	15°57'	46°53'	1100	
9(A)	DF	Brasília	Fazenda Água Limpa	15°57'	46°53'	1100	
10(A)	DF	Brasília	Fazenda Água Limpa	15°57'	46°53'	1100	
11(A)	DF	Brasília	Fazenda Água Limpa	15°57'	46°53'	1100	
12(A)	DF	Brasília	Fazenda Água Limpa	15°57'	46°53'	1100	Felfili and Silva Jr. (1992)
13(A)	DF	Brasília	Fazenda Água Limpa	15°57'	46°53'	1100	
14(A)	DF	Brasília	Fazenda Água Limpa	15°57'	46°53'	1100	Santos (1988)
15(A)	DF	Brasília	Parque Nacional de Brasília	15°40'	47°59'	1135	Oliveira et al. (1982)
16(A)	DF	Brasília	Parque Nacional de Brasília	15°40'	47°59'	1135	
17(A)	DF	Brasília	Campus da Universidade de Brasília	15°45'	47°52'	1172	Heringer (1971), Heringer and Barroso (1968)
18(A)	DF	Brasília	Estação Ecológica do Roncador	15°57'	47°53'	1170	Santos (1988)
19(A)	DF	Brasília	Reserva da TERRACAP	15°54'	47°50'	1155	Araújo (1984)
20(A)	DF	Brasília e Gama	(a)	15°45'	47°45'	1125	

Table 1. Continued.

21(A)	DF	Brasília e Planaltina	Área de Proteção Ambiental da Bacia do Rio São Bartolomeu	15°50'	47°30'	963	Pereira et al. (1990)
22(A)	DF	Brasília e Planaltina	Área de Proteção Ambiental da Bacia do Rio São Bartolomeu	15°50'	47°30'	963	
23(A)	DF	Brasília e Planaltina	Área de Proteção Ambiental da Bacia do Rio São Bartolomeu	15°50'	47°30'	963	
24(A)	DF	Brasília, Gama e Planaltina	(a)	15°45'	47°45'	1125	Aoki and Santos (1980, 1982), Santos and Aoki (1992)
25(A)	DF	Brasília, Gama, Planaltina e Taguatinga	(a)	15°45'	47°45'	1125	
26(A)	DF	Planaltina	Centro de Pesquisa Agropecuária dos Cerrados	15°36'	47°40'	975	Ribeiro et al. (1982)
27(A)	DF	Planaltina	Centro de Pesquisa Agropecuária dos Cerrados	15°36'	47°40'	975	
28(A)	DF	Planaltina	Centro de Pesquisa Agropecuária dos Cerrados	15°36'	47°40'	975	
29(A)	DF	Planaltina	Centro de Pesquisa Agropecuária dos Cerrados	15°36'	47°40'	975	
30(A)	DF	Planaltina	Centro de Pesquisa Agropecuária dos Cerrados	15°36'	47°40'	975	Ribeiro et al. (1985)
31(A)	DF	Planaltina	Centro de Pesquisa Agropecuária dos Cerrados	15°36'	47°40'	975	

Table 1. Continued.

32(A)	DF	Planaltina	Centro de Pesquisa Agropecuária dos Cerrados	15°36'	47°40'	975	
33(A)	DF	Planaltina	Centro de Pesquisa Agropecuária dos Cerrados	15°36'	47°40'	975	Santos (1988)
34(A)	DF	Planaltina	Centro de Pesquisa Agropecuária dos Cerrados	15°36'	47°40'	975	Ribeiro and Haridasan (1990)
35(A)	DF	Planaltina	Centro de Pesquisa Agropecuária dos Cerrados	15°36'	47°40'	975	
36(A)	DF	Planaltina	Reserva Biológica de Águas Emendadas	15°35'	47°40'	1175	Brandão (1976), Distrito Federal (1977)
37	GO	Goiania	(a)	16°40'	49°15'	730	Rizzo et al. (1973)
38	GO	Goiás e Mossâmedes	Serra Dourada	16°05'	50°20'	700	Rizzo (1970)
39(B)	GO	Padre Bernardo	(a)	15°15'	48°30'	629	Ratter and Dargie (1992), Ratter et al. (1977)
40(B)	GO	Padre Bernardo	Fazenda Lagoa Santa	15°12'	48°21'	640	
41(C)	MG	Alpinópolis	Fazenda Monte Alto	20°54'	46°21'	876	Carvalho (1987)
42(C)	MG	Arinos	Sagarana	15°55'	46°03'	480	Ratter and Dargie (1992)
43(C)	MG	Campo do Meio	Fazenda Campo das Flores	21°02'	45°58'	785	Carvalho (1987)
44	MG	Curvelo	(a)	18°45'	44°25'	633	Rizzini (1975)
45(D)	MG	Frutal, Ituiutaba, Tupaciguara e Uberlândia	Triângulo Mineiro	19°20'	48°50'	752	Goodland (1970, 1979)
46(D)	MG	Frutal, Ituiutaba, Tupaciguara e Uberlândia	Triângulo Mineiro	19°20'	48°50'	692	

Table 1. Continued.

47(D)	MG	Frutal, Ituiutaba, Tupaciguara e Uberlândia	Triângulo Mineiro	19°20'	48°50'	742	
48(D)	MG	Frutal, Ituiutaba, Tupaciguara e Uberlândia	Triângulo Mineiro	19°20'	48°50'	713	
49	MG	Januária	Pandeiros	15°28'	44°23'	434	
50	MG	Lavras	Reserva Biológica Municipal de Poço Bonito	21°14'	45°00'	801	Gavilanes et al. (1990)
51	MG	Ouro Preto	(a)	20°33'	43°30'	1061	Zurlo (1978)
52(E)	MG	Paraopeba	Estação Florestal de Experimentação de Paraopeba	19°20'	44°20'	742	Silva Jr. (1984), Silva Jr. And Silva (1988)
53(E)	MG	Paraopeba	Estação Florestal de Experimentação de Paraopeba	19°20'	44°20'	742	Thibau et al. (1975)
54(E)	MG	Pedro Leopoldo	Fazenda da Jaguará	19°37'	44°02'	698	(Rizzini, 1975)
55(E)	MG	Pedro Leopoldo	Fazenda da Jaguará	19°37'	44°02'	698	
56(E)	MG	Pedro Leopoldo	Fazenda da Jaguará	19°37'	44°02'	698	Castro (1975)
57	MG	Pimenta	Fazenda Serra dos Lopes	20°30'	45°57'	776	
58(F)	MG	Prudente de Moraes	Fazenda Experimental de Santa Rita	19°29'	44°09'	732	Brandão et al. (1981)
59(F)	MG	Sete Lagoas	Instituto de Pesquisa Agropecuária do Centro-Oeste	19°28'	44°15'	775	Silva et al. (1974/76)
60(F)	MG	Sete Lagoas	(a)	19°25'	44°15'	771	Brandão et al. (1984)
61	MS	Corumbá	Fazenda Acurizal	17°45'	57°37'	90	Prance and Schaller (1982)
62	MS	Corumbá	Fazenda Ipanema	18°59'	56°39'	89	Ratter et al. (1988b)
63	MS	Corumbá	Fazenda Nhumirim (Bahia Suja)	19°00'	56°40'	89	
64	MS	Corumbá	Fazenda Nhumirim (Salina Grande)	19°05'	56°45'	89	

Table 1. Continued.

65	MS	Corumbá	Fazenda Nhumirim (Salina Grande)	19°05'	56°45'	89	
66	MS	Corumbá	Fazenda Nhumirim (Cerrado)	19°03'	56°43'	89	
67	MS	Corumbá	Fazenda Nhumirim (Cerrado)	19°03'	56°43'	89	
68	MT	(a)	Serra do Roncador (Base de Campo da Expedição Xavantina-Cachimbo)	12°49'	51°46'	400	Eiten (1975), Ratter et al. (1973)
69	MT	(a)	Serra do Roncador (Base de Campo da Expedição Xavantina-Cachimbo)	12°49'	51°46'	400	
70	MT	(a)	Serra do Roncador (Base de Campo da Expedição Xavantina - Cachimbo)	12°49'	51°46'	400	
71	MT	(a)	Serra do Roncador (Base de Campo da Expedição Xavantina - Cachimbo)	12°49'	51°46'	400	
72	MT	(a)	Serra do Roncador (Base de Campo da Expedição Xavantina-Cachimbo)	12°49'	51°46'	400	
73	MT	(a)	Serra do Roncador (Base de Campo da Expedição Xavantina - Cachimbo)	12°49'	51°46'	400	
74	MT	(a)	Serra do Roncador (Base de Campo da Expedição Xavantina - Cachimbo)	12°49'	51°46'	400	
75	MT	(a)	Serra do Roncador (Base de Campo da Expedição Xavantina - Cachimbo)	12°49'	51°46'	400	
76	MT	(a)	Serra do Roncador (Base de Campo da Expedição Xavantina - Cachimbo)	12°49'	51°46'	400	Ratter and Dargie (1992), Ratter et al. (1977)

Table 1. Continued.

77	MT	Barra do Garças	Vale dos Sonhos	15°21'	52°13'	318	Ratter and Dargie (1992), Ratter et al. (1977)
78	MT	Cuiabá	Salgadeira	15°21'	55°49'	375	Oliveira Filho (1984), Oliveira Filho et al. (1989)
79	MT	Cuiabá	Salgadeira	15°21'	55°49'	515	Oliveira Filho and Martins (1986)
80	MT	Cuiabá	Salgadeira	15°21'	55°49'	515	
81	MT	Cuiabá	Salgadeira	15°21'	55°49'	515	
82	MT	Cuiabá	Salgadeira	15°21'	55°49'	515	
83(G)	MT	Nova Xavantina	Serra do Roncador	14°45'	52°20'	400	Eiten (1975), Ratter et al. (1973)
84(G)	MT	Nova Xavantina	Serra do Roncador	14°45'	52°20'	400	
85(G)	MT	Nova Xavantina	Serra do Roncador	14°45'	52°20'	400	
86(G)	MT	Nova Xavantina	Serra do Roncador	14°45'	52°20'	400	Ratter and Dargie (1992), Ratter et al. (1973)
87	MT	Poconé	Fazenda São Vicente do Rio Claro	16°16'	56°38'	93	
88	MT	Poconé	Fazenda São Vicente do Rio Claro	16°16'	56°38'	93	Ratter et al. (1977), Ratter and Dargie (1992)
89(H)	MT	Torixoréu	Morro da Fumaça (Fazenda Alvorada)	15°53'	52°15'	40	Furley et al. (1988)
90(H)	MT	Torixoréu	Morro da Fumaça (Fazenda Alvorada)	15°53'	52°15'	40	
91(H)	MT	Torixoréu	Morro da Fumaça (Fazenda Alvorada)	15°53'	52°15'	40	
92	PA	Salvaterra	Ilha de Marajó (Vila de Joanes)	0°53'	48°35'	8	Bastos (1984)
93	PE	Goiania	(a)	7°33'	35°00'	13	Haynes (1970), Tavares (1964a, b)
94(K)	PI	Barras	Fazenda Lagoa Seca	4°14'	41°37'	75	
95(K)	PI	Batalha	Fazenda Caiçara	4°01'	42°04'	80	
96(K)	PI	Batalha	Fazenda Bom Princípio	4°08'	42°09'	80	
97(J)	PI	Benedictinos	Fazenda Descanso	5°27'	42°21'	80	Castro et al. (in press)
98(K)	PI	Capitão de Campos	Fazenda Santana	4°27'	41°56'	140	
99	PI	Elesbão Veloso	Fazenda Vista Alegre	6°12'	42°08'	230	

Table 1. Continued.

100	PI	José de Freitas	Fazenda Tucum	4°45'	42°35'	137	
101(J)	PI	Monsenhor Gil	Fazenda Toti Negra	5°33'	42°37'	115	
102	PI	Oeiras	Fazenda Piloto Chapada Grande	6°36'	42°16'	430	Castro et al. (in press)
103(L)	PI	Piracuruca	Fazenda Alto Bonito	3°56'	41°43'	70	
104(L)	PI	Piracuruca e Piripiri	Parque Nacional de Sete Cidades	4°06'	41°43'	275	Barroso and Guimarães (1980)
105(L)	PI	Piripiri	Fazenda Carnaubal	4°16'	41°47'	160	
106	PI	Ribeiro Gonçalves	Estação Ecológica de Uruçui-Una	8°51'	45°15'	400	Castro (1984), Castro et al. (in press)
107(M)	RR	(a)	Campos de Roraima (Milagre, Normandia, Paricarana, Pedra do Passarão e Surumu)	4°03' N	60°25'	133	Dantas and Rodrigues (1982)
108(M)	RR	(a)	Campos de Roraima	4°03' N	60°25'	133	Rodrigues (1971)
109(M)	RR	(a)	Campos de Roraima (Milagre, Normandia, Paricarana, Pedra do Passarão e Surumu)	4°03' N	60°25'	133	Dantas and Rodrigues (1982)
110(N)	SP	Águas de Santa Bárbara	Estação Ecológica de Santa Bárbara	22°53'	49°14'	510	Meira Neto (1991)
111(N)	SP	Águas de Santa Bárbara	Estação Ecológica de Santa Bárbara	22°53'	49°14'	510	
112(N)	SP	Águas de Santa Bárbara	Estação Ecológica de Santa Bárbara	22°53'	49°14'	510	
113(N)	SP	Águas de Santa Bárbara	Estação Ecológica de Santa Bárbara	22°53'	49°14'	510	
114(N)	SP	Águas de Santa Bárbara	Estação Ecológica de Santa Bárbara	22°53'	49°14'	510	
115(N)	SP	Análândia	Área de Proteção Ambiental de Corumbatai	22°08'	47°40'	685	
116(N)	SP	Angatuba	Instituto Florestal de São Paulo	23°27'	48°25'	598	Ratter et al. (1988a)

Table 1. Continued.

117(N)	SP	Angatuba	Instituto Florestal de São Paulo	23°27'	48°25'	598	
118(N)	SP	Angatuba	Instituto Florestal de São Paulo	23°27'	48°25'	598	
119(O)	SP	Bauru	(a)	22°20'	49°00'	499	Ferracini et al. (1983)
120(O)	SP	Bauru	Parque Ecológico Municipal de Bauru	22°20'	49°00'	580	Cavassan (1990)
121(P)	SP	Botucatu	Fazenda Treze de Maio	22°45'	48°25'	550	Silberbauer-Gottsberger and Eiten (1983, 1987), Silberbauer-Gottsberger et al. (1977)
122(P)	SP	Botucatu	Fazenda Treze de Maio	22°45'	48°25'	550	Gottsberger and Silberbauer-Gottsberger (1983)
123(P)	SP	Botucatu	Fazenda Treze de Maio	22°45'	48°25'	550	
124(P)	SP	Brotas e Itirapina	Represa do Lobo	22°16'	47°52'	715	Souza (1977)
125(P)	SP	Corumbatai	Campus da Universidade Estadual Paulista (Rio Claro)	22°15'	47°00'	815	Cesar et al. (1988)
126(P)	SP	Corumbatai	Área de Proteção Ambiental de Corumbatai	22°13'	47°37'	570	Pagano et al. (1989a, b)
127(P)	SP	Itirapina	Estação Experimental de Itirapina	22°15'	47°49'	760	Giannotti (1986), Giannotti and Leitão Filho (1992)
128(P)	SP	Itirapina	Estação Experimental de Itirapina	22°15'	47°49'	760	
129(P)	SP	Itirapina	Área de Proteção Ambiental de Corumbatai	22°18'	47°44'	700	
130(P)	SP	Itirapina	(a)	22°16'	47°10'	760	Mantovani (1990)
131(P)	SP	Itirapina	(a)	22°16'	47°10'	760	
132(P)	SP	Itirapina	(a)	22°16'	47°10'	760	
133(R)	SP	Luís Antonio	Estação Experimental de Luís Antonio	21°40'	47°49'	670	Toledo Filho (1984)
134(Q)	SP	Moji Guaçu	Reserva Biológica de Moji Guaçu	22°18'	47°09'	680	Batista (1982, 1988), Batista and Couto (1992)

Table 1. Continued.

135(Q)	SP	Moji Guaçu	Reserva Biológica de Moji Guaçu	22°18'	47°09'	600	Mantovani (1983), Mantovani et al. (1985)
136(Q)	SP	Moji Guaçu	Fazenda Campinha	22°18'	47°09'	600	Gibbs et al. (1983)
137(Q)	SP	Moji Mirim	Estação Experimental de Moji Mirim	22°26'	46°57'	631	Toledo Filho et al. (1984)
138(P)	SP	Santa Maria da Serra	Área de Proteção Ambiental de Corumbatai	22°38'	48°07'	500	
139(R)	SP	Santa Rita do Passa Quatro	Parque Estadual de Vaçununga (Gleba Pé de Gigante)	21°38'	47°36'	700	Castro (1987)
140	SP	São José do Rio Preto	(a)	20°48'	49°23'	475	Camargo and Marini (1966)
141	SP	Assis	Estação Experimental de Assis	22°35'	50°25'	562	Durigan et al. (1987)
142	TO	Cristalândia, Formoso do Araguaia e Pium	Ilha do Bananal (Parque Nacional do Araguaia)	10°31'	50°12'	205	Ratter (1985b, 1987)
143	TO	Cristalândia, Formoso do Araguaia e Pium	Ilha do Bananal (Parque Nacional do Araguaia)	10°31'	50°12'	205	
144	TO	Cristalândia, Formoso do Araguaia e Pium	Ilha do Bananal (Parque Nacional do Araguaia)	10°31'	50°12'	205	
145	TO	Cristalândia, Formoso do Araguaia e Pium	Ilha do Bananal (Parque Nacional do Araguaia)	10°31'	50°12'	205	

Table 2. "Refined" list of families (according to Cronquist, 1981, 1988) and species of shrubs and trees reported to occur in cerrado vegetation. *spp.* *x* indicates *x* taxonomic entities not identified at species level. *unknown x* indicates *x* taxonomic entities not identified at the genus level. The asterisk (*) means that the binomial was taken as it stands in the original publication: no synonym or author was found for it in the taxonomic literature.

Acanthaceae	
	<i>Ruellia geminiflora</i> Kunth
Amaranthaceae	
	<i>Gomphrena macrocephala</i> A. St.-Hil.
Anacardiaceae	
	<i>Anacardium humile</i> A. St.-Hil.
	<i>Anacardium occidentale</i> L.
	<i>Astronium fraxinifolium</i> Schott
	<i>Astronium</i> cf. <i>fraxinifolium</i> Schott
	<i>Astronium</i> cf. <i>lecointe</i> Ducke
	<i>Astronium ulei</i> Mattick
	<i>Lithraea molleoides</i> (Vell.) Engl.
	<i>Lithraea</i> sp.
	<i>Miracrodruon urundeuva</i> Alemão
	<i>Schinus terebinthifolius</i> Raddi
	<i>Spondias purpurea</i> L.
	<i>Tapirira guianensis</i> Aubl.
	<i>Tapirira marchandii</i> Engl.
	<i>Tapirira</i> sp.
Annonaceae	
	<i>Annona campestris</i> R. E. Fr.
	<i>Annona coriacea</i> Mart.
	<i>Annona cornifolia</i> A. St.-Hil.
	<i>Annona crassiflora</i> Mart.
	<i>Annona crotonifolia</i> Mart.
	<i>Annona dioica</i> A. St.-Hil.
	<i>Annona muricata</i> L.
	<i>Annona pygmaea</i> (Warm.) Warm.
	<i>Annona reticulata</i> L.
	<i>Annona tomentosa</i> R. E. Fr.
	<i>Annona</i> cf. <i>tomentosa</i> R. E. Fr.
	<i>Annona</i> spp. 6
	<i>Bocageopsis mattogrossensis</i> (R. E. Fr.) R. E. Fr.
	<i>Cardiopetalum calophyllum</i> Schltdl.
	<i>Duguetia echinophora</i> R. E. Fr.
	<i>Duguetia furfuracea</i> (A. St.-Hil.) Benth. & Hook. f.
	<i>Duguetia lanceolata</i> A. St.-Hil.
	<i>Ephedranthus parviflorus</i> S. Moore
	<i>Guatteria</i> aff. <i>minarum</i> R. E. Fr.
	<i>Guatteria nigrescens</i> Mart.
	<i>Guatteria silvatica</i> R. E. Fr.
	<i>Guatteria subsessilis</i> Mart.
	<i>Guatteria</i> spp. 3
	<i>Rollinia emarginata</i> Schltdl.
	<i>Rollinia sylvatica</i> (A. St. Hil.) Mart.
	<i>Rollinia</i> sp.
	<i>Unonopsis lindmani</i> R. E. Fr.
	<i>Xylopia aromatica</i> (Lam.) Mart.
	<i>Xylopia brasiliensis</i> Spreng.
	<i>Xylopia emarginata</i> Mart.
	<i>Xylopia sericea</i> A. St.-Hil.
	<i>Xylopia</i> spp. 2
Apocynaceae	
	<i>Aspidosperma cuspa</i> (Kunth) S. T. Blake

Table 2. Continued	
	<i>Aspidosperma cylindrocarpon</i> Müll. Arg.
	<i>Aspidosperma macrocarpon</i> Mart.
	<i>Aspidosperma multiflorum</i> A. DC.
	<i>Aspidosperma nobile</i> Müll. Arg.
	<i>Aspidosperma polyneuron</i> Müll. Arg.
	<i>Aspidosperma pyricolium</i> Müll. Arg.
	<i>Aspidosperma pyrifolium</i> Mart.
	<i>Aspidosperma subincanum</i> Mart. ex A. DC.
	<i>Aspidosperma tomentosum</i> Mart.
	<i>Aspidosperma verbascifolium</i> Müll. Arg.
	<i>Aspidosperma</i> spp. 9
	<i>Hancornia speciosa</i> M. Gómez
	<i>Himatanthus articulatus</i> (Vahl) Woodson
	<i>Himatanthus bracteatus</i> (A. DC.) Woodson
	<i>Himatanthus cuneatus</i> Sm.
	<i>Himatanthus obovatus</i> (Müll. Arg.) Woodson
	<i>Himatanthus phagedaenicus</i> (Mart.) Woodson
	<i>Himatanthus</i> sp.
	<i>Mandevilla erecta</i> (Vell.) Woodson
	<i>Mandevilla gentianoides</i> (Mill.) Woodson
	<i>Odontadenia lutea</i> (Vell.) Markgr.
	<i>Peschiera affinis</i> (Müll. Arg.) Miers
	<i>Peschiera hystrix</i> (Steud.) A. DC.
	<i>Rauvolfia ternifolia</i> Kunth
Aquifoliaceae	
	<i>Ilex affinis</i> Gardner
	<i>Ilex asperula</i> Mart.
	<i>Ilex cerasifolia</i> Reissek
	<i>Ilex conocarpa</i> Reissek
	<i>Ilex</i> cf. <i>conocarpa</i> Reissek
	<i>Ilex</i> sp.
Araliaceae	
	<i>Dendropanax cuneatum</i> (DC.) Decne. & Planch.
	<i>Dendropanax</i> sp.
	<i>Didymopanax distractiflorum</i> Harms
	<i>Didymopanax macrocarpum</i> (Cham. & Schltdl.) Seemann
	<i>Didymopanax morototoni</i> (Aubl.) Decne. & Planch.
	<i>Didymopanax vinosum</i> Cham. & Schltdl.
	<i>Didymopanax</i> spp. 3
Areceaceae	
	<i>Acanthococos emensis</i> Toledo
	<i>Acrocomia aculeata</i> (Jacq.) Lodd.
	<i>Acrocomia totai</i> Mart.
	<i>Acrocomia</i> sp.
	<i>Allagoptera campestris</i> (Mart.) Kuntze
	<i>Astrocaryum campestre</i> Mart.
	<i>Astrocaryum vulgare</i> Mart.
	<i>Astrocaryum</i> spp. 2
	<i>Attalea exigua</i> Drude
	<i>Attalea geraensis</i> Barb. Rodr.
	<i>Attalea humilis</i> Mart.
	<i>Attalea phalerata</i> Mart. & Spreng.
	<i>Attalea</i> sp.
	<i>Bactris</i> spp. 2
	<i>Butia leiospatha</i> (Mart.) Becc.

Table 2. Continued.

<i>Butia paraguayensis</i> (Barb. Rodr.) L. H. Bailey
<i>Copernicia prunifera</i> (Mill.) H. E. Moore
<i>Mauritia martiana</i> Spruce
<i>Maximiliana regia</i> Mart.
<i>Oenocarpus distichus</i> Mart.
<i>Orbignya phalerata</i> Mart.
<i>Orbignya</i> sp.
<i>Syagrus comosa</i> (Mart.) Mart.
<i>Syagrus flexuosa</i> (Mart.) Becc.
<i>Syagrus loefgrenii</i> Glassman
<i>Syagrus petraea</i> (Mart.) Becc.
<i>Syagrus romanzoffiana</i> (Cham.) Glassman
<i>Syagrus</i> spp. 9
Unknown 5
Asclepidaceae
<i>Hemipogon setaceus</i> Decne.
<i>Hemipogon</i> sp.
<i>Pseudibatia</i> sp.
Asteraceae
* <i>Baccharis</i> aff. <i>campestris</i>
<i>Baccharis concinna</i> G. M. Barroso
<i>Baccharis dracunculifolia</i> DC.
<i>Baccharis lymanii</i> G. M. Barroso
<i>Baccharis</i> cf. <i>microdonta</i> DC.
<i>Baccharis pseudotenuifolia</i> I. L. Teodoro
<i>Baccharis ramosissima</i> Gardner
<i>Baccharis reticularia</i> DC.
<i>Baccharis semiserrata</i> DC.
<i>Baccharis tridentata</i> Vahl
<i>Baccharis trimera</i> DC.
<i>Baccharis</i> spp. 4
<i>Brickellia pinifolia</i> A. Gray
<i>Clibadium rotundifolium</i> DC.
<i>Dasyphyllum orthacantum</i> (DC.) Cabrera
<i>Elephantopus biflora</i> Sch. Bip.
<i>Eremanthus glomeratus</i> Less.
<i>Eremanthus goyazensis</i> (Gardner) Sch. Bip.
<i>Eremanthus mattogrossensis</i> Kuntze
<i>Eremanthus sphaerocephalus</i> (DC.) Baker
<i>Eremanthus</i> spp. 3
<i>Eupatorium barbacense</i> Hieron.
<i>Eupatorium cuneatum</i> DC.
<i>Eupatorium laevigatum</i> Lam.
<i>Eupatorium maximiliani</i> Schrad. ex DC.
<i>Eupatorium squalidum</i> DC.
<i>Eupatorium trixoides</i> Mart. ex Baker
<i>Eupatorium vauthierianum</i> DC.
<i>Eupatorium</i> spp. 8
<i>Gochnatia barrosii</i> Cabrera
<i>Gochnatia floribunda</i> Cabrera
<i>Gochnatia polymorpha</i> (Less.) Cabrera
<i>Gochnatia pulchra</i> Cabrera
<i>Gochnatia velutina</i> (Bong.) Cabrera
<i>Gorceixia</i> sp.
<i>Hoehnephytum trixioides</i> (Gardner) Cabrera
<i>Ichthyothere cunabi</i> Mart.
<i>Lychnophora ericoides</i> Mart.
<i>Mikania sessilifolia</i> DC.
<i>Piptocarpha rotundifolia</i> (Less.) Baker
<i>Piptocarpha</i> sp.
<i>Senecio brasiliensis</i> Less.
<i>Senecio</i> aff. <i>oxyphyllus</i> DC.

Table 2. Continued.

<i>Symphypappus polystachyus</i> (DC.) Baker
<i>Trichogonia alternata</i> *
<i>Trichogonia campestris</i> Gardner
<i>Trixis verbasciformis</i> Less.
<i>Vanillosmopsis erythropappa</i> Sch. Bip.
<i>Vanillosmopsis</i> sp.
<i>Vernonia bardanoides</i> Less.
<i>Vernonia brasiliensis</i> (Spreng.) Less.
<i>Vernonia chamissonis</i> Less.
<i>Vernonia diffusa</i> (Spreng.) Less.
<i>Vernonia ferruginea</i> Less.
<i>Vernonia fruticulosa</i> Mart. ex DC.
<i>Vernonia glabrata</i> Less.
<i>Vernonia grandiflora</i> Less.
<i>Vernonia missionis</i> Gardner
<i>Vernonia mucronulata</i> Less.
<i>Vernonia oligolepis</i> Sch. Bip. ex Baker
<i>Vernonia phosphorea</i> (Vell.) H. Monteiro*
<i>Vernonia polyanthes</i> (Spreng.) Less.
<i>Vernonia rubriramea</i> Mart. ex DC.
<i>Vernonia ruficoma</i> Schltdl. ex Mart.
<i>Vernonia</i> cf. <i>ruficoma</i> Schltdl. ex Mart.
<i>Vernonia</i> aff. <i>varroniaefolia</i> DC.
<i>Vernonia</i> spp. 5
<i>Wunderlichia mirabilis</i> Riedel ex Baker
Unknown 4
Bignoniaceae
<i>Anemopaegma arvense</i> (Vell.) Stellfeld
<i>Anemopaegma glaucum</i> Mart.
<i>Anemopaegma</i> sp.
<i>Arrabidaea brachypoda</i> (DC.) Bureau & K. Schum.
<i>Arrabidaea corallina</i> (Jacq.) Sandwith
<i>Arrabidaea inaequalis</i> Baill.
<i>Arrabidaea sceptrum</i> (Cham.) Sandwith
<i>Arrabidaea</i> sp.
<i>Crescentia cujete</i> L.
<i>Cybistax antisiphilitica</i> (Mart.) Mart.
<i>Distictella mansoana</i> (DC.) Urb.
<i>Fridericia speciosa</i> Mart.
<i>Jacaranda acutifolia</i> Humb. & Bonpl.
<i>Jacaranda brasiliana</i> (Lam.) Pres.
<i>Jacaranda caroba</i> (Vell.) DC.
<i>Jacaranda copaia</i> (Aubl.) D. Don
<i>Jacaranda cuspidifolia</i> Mart.
<i>Jacaranda decurrens</i> Cham.
<i>Jacaranda jasminoides</i> (Thunb.) Sandwith
<i>Jacaranda paucifoliolata</i> Mart. ex DC.
<i>Jacaranda puberula</i> Cham.
<i>Jacaranda rufa</i> J. Silva Manso
<i>Jacaranda ulei</i> Bureau & K. Schum.
<i>Jacaranda</i> spp. 7
<i>Memora axilaris</i> Bureau & K. Schum.
<i>Memora cuspidata</i> Hassl.
<i>Memora nodosa</i> (J. Silva Manso) Miers
<i>Memora peregrina</i> (Miers) Sandwith
<i>Memora</i> sp.
<i>Tabebuia alba</i> (Cham.) Sandwith
<i>Tabebuia aurea</i> (J. Silva Manso) Benth. & Hook.
<i>Tabebuia chrysantha</i> (Jacq.) G. Nicholson
<i>Tabebuia impetiginosa</i> (Mart. ex DC.) Standley
<i>Tabebuia insignis</i> (Miq.) Sandwith
<i>Tabebuia ochracea</i> (Cham.) Standley
<i>Tabebuia roseo-alba</i> (Ridl.) Sandwith

Table 2. Continued.

Tabebuia serratifolia (Vahl) G. Nicholson
Tabebuia spp. 13
Tecoma leucoxydon Mart. ex DC.
Zeyheria montana Mart.
Unknown 2
Bixaceae
Cochlospermum regium (Schrank) Pilg.
Cochlospermum vitifolium (Willd.) Spreng.
Bombacaceae
Bombax cyathophorum (Casar.) K. Schum.
Bombax sp.
Eriotheca gracilipes (K. Schum.) A. Robyns
Eriotheca pubescens (Mart. & Zucc.) Schott & Endl.
Pseudobombax longiflorum (Mart. & Zucc.) A. Robyns
Pseudobombax marginatum (A. St.-Hil., A. Juss. & Chambess.) A. Robyns
Pseudobombax tomentosum (Mart. & Zucc.) A. Robyns
Pseudobombax spp. 2
Boraginaceae
Cordia alliodora (Ruiz & Pav.) Oken
Cordia bicolor A. DC.
Cordia discolor Cham.
Cordia ecalyculata Vell.
Cordia glabrata (Mart.) A. DC.
Cordia insignis Cham.
Cordia nodosa Lam.
Cordia sellowiana Cham.
Cordia superba Cham.
Cordia spp. 2
Tournefortia sp.
Burseraceae
Bursera leptophloeos Engl.
Bursera simaruba (L.) Sarg.
Bursera sp.
Protium almecega Marchand
Protium aracouchini (Aubl.) Marchand
Protium brasiliense (Spreng.) Engl.
Protium elegans Engl.
Protium heptaphyllum (Aubl.) Marchand
Protium ovatum Engl.
Protium pilosissimum Engl.
Protium spp. 3
Tetragastris unifoliolata (Engl.) Cuatrec.
Cactaceae
Cereus jamacaru DC.
Caesalpinaceae
Apuleia leiocarpa (Vog.) J. F. Macbr.
Bauhinia amplifolia Ducke
Bauhinia brevipes Vogel
Bauhinia aff. cheilantha (Bong.) Steud.
Bauhinia cupulata Benth.
Bauhinia cuyabensis (Bong.) Steud.
Bauhinia dubia Don
Bauhinia goyazensis Harms
Bauhinia macrostachya Benth.
Bauhinia mollis D. Dietr.
Bauhinia pulchella Benth.
Bauhinia rufa (Bong.) Steud.
Bauhinia tenella Benth.
Bauhinia unguolata L.

Table 2. Continued.

Bauhinia spp. 5
Caesalpinia bracteosa Tul.
Caesalpinia ferrea Mart. ex Tul.
Cassia moschata Kunth
Cassia pendula Humb. & Bonpl. ex Willd.
Cassia spp. 8
Cenostigma gardnerianum Tul.
Cenostigma macrophyllum Tul.
Chamaecrista cathartica (Mart.) H. S. Irwin & Barneby
Chamaecrista clausenii (Benth.) H. S. Irwin & Barneby
Chamaecrista conferta (Benth.) H. S. Irwin & Barneby
Chamaecrista cotonifolia (Don) H. S. Irwin & Barneby
Chamaecrista dalbergiifolia (Benth.) H. S. Irwin & Barneby
Chamaecrista desvauxii (Collad.) Killip
Chamaecrista ensiformis (Vell.) H. S. Irwin & Barneby
Chamaecrista isidorea (Benth.) H. S. Irwin & Barneby
Chamaecrista juruenensis (Hoehne) H. S. Irwin & Barneby
Chamaecrista orbiculata (Benth.) H. S. Irwin & Barneby
Chamaecrista rotundata (Vogel) H. S. Irwin & Barneby
Chamaecrista zygophylloides (Taub.) H. S. Irwin & Barneby
Chamaecrista sp.
Copaifera coriacea Mart.
Copaifera langsdorffii Desf.
Copaifera luetzelburgii Harms
Copaifera martii Hayne
Dimorphandra gardneriana Tul.
Dimorphandra mollis Benth.
Dimorphandra cf. wilsonii Rizzini
Diptychandra aurantiaca Tul.
Diptychandra glabra Benth.
Hymenaea courbaril L.
Hymenaea maranhensis Y. T. Lee & Langenh.
Hymenaea martiana Hayne
Hymenaea stigonocarpa Mart. ex Hayne
Hymenaea velutina Ducke
Hymenaea spp. 3
Macrolobium bifolium (Aubl.) Pers.
Macrolobium sp.
Martiodendron mediterraneum (Mart. ex Benth.) Koep- pen
Peltogyne confertiflora (Hayne) Benth.
Peltogyne paniculata Benth.
Peltogyne sp.
Peltophorum vogelianum Benth.
Pterogyne nitens Tul.
Schizolobium parayba (Vell.) Blake
Sclerolobium aureum (Tul.) Benth.
Sclerolobium hypoleucum Benth.
Sclerolobium paniculatum Vogel
Sclerolobium cf. paniculatum Vogel
Sclerolobium spp. 2
Senna alata (L.) Roxb.
Senna bicapsularis (L.) Roxb.
Senna latifolia (G. Mey) H. S. Irwin & Barneby
Senna macranthera (Collad.) H. S. Irwin & Barneby
Senna obtusifolia (L.) H. S. Irwin & Barneby
Senna rugosa (Don) H. S. Irwin & Barneby
Senna silvestris (Vell.) H. S. Irwin & Barneby
Senna spectabilis (DC.) H. S. Irwin & Barneby
Senna trachypus (Benth.) H. S. Irwin & Barneby
Senna velutina (Vogel) H. S. Irwin & Barneby

Table 2. Continued.

Senna sp.
Swartzia flaemingii Raddi
Swartzia latifolia Benth.
Swartzia racemosa Benth.
Swartzia sp.
Caricaceae
Jacaratia sp.
Caryocaraceae
Caryocar brasiliense Cambess.
Caryocar coriaceum Wittm.
Cecropiaceae
Cecropia adenopus Mart.
Cecropia cinerea Miq.
Cecropia cf. cinerea Miq.
Cecropia concolor Willd.
Cecropia obtus Trécul
Cecropia pachystachya Trécul
Cecropia cf. pachystachya Trécul
Cecropia spp. 4
Celastraceae
Austroplenckia populnea (Reissek) Lundell
Austroplenckia sp.
Maytenus alaternoides Reissek
Maytenus aff. alaternoides Reissek
Maytenus cf. alaternoides Reissek
Maytenus communis Reissek
Maytenus evonymoides Reissek
Maytenus obtusifolia Mart.
Maytenus rigida Mart.
Maytenus spp. 3
Chrysobalanaceae
Couepia grandiflora (Mart. & Zucc.) Benth. ex Hook. f.
Exellodendron gardneri (Hook. f.) Prance
Hirtella ciliata Mart. & Zucc.
Hirtella glandulosa Spreng.
Hirtella gracilipes (Hook. f.) Prance
Hirtella hoehnei Pilg.
Hirtella racemosa Lam.
Hirtella spp. 2
Licania apetala (E. Mey.) Fritsch
Licania blackii Prance
Licania gardneri (Hook. f.) Fritsch
Licania hoehnei Pilg.
Licania humilis Cham. & Schltdl.
Licania kunthiana Hook. f.
Licania minuscula Cuatrec.
Licania octandra (Hoffmanns. ex Roem. & Schult.) Kuntze
Licania rigida Benth.
Licania spp. 5
Parinari campestre Aubl.
Parinari obtusifolia Hook. f.
Clethraceae
Clethra brasiliensis Cham. & Schltdl.
Clusiaceae
Calophyllum brasiliense Cambess.
Clusia cf. insignis Mart.
Clusia microphylla Klotzsch ex Engl.
Clusia sellowiana Schltdl.

Table 2. Continued.

Clusia sp.
Kielmeyera abdita Saddi
Kielmeyera coriacea (Spreng.) Mart.
Kielmeyera corymbosa (Spreng.) Mart.
Kielmeyera grandiflora (Wawra) Saddi
Kielmeyera rubriflora Cambess.
Kielmeyera speciosa A. St.-Hil.
Kielmeyera suberosa
Kielmeyera variabilis (Spreng.) Mart.
Kielmeyera cf. variabilis (Spreng.) Mart.
Kielmeyera spp. 6
Mahurea exstipulata Benth.
Platonia insignis Mart.
Symphonia globulifera L. f.
Vismia amazonica Ewan
Vismia brasiliensis Choisy
Vismia cayennensis (Jacq.) Pers.
Vismia guianensis (Aubl.) Choisy
Vismia magnoliaefolia Cham. & Schltdl.
Vismia spp. 3
Combretaceae
Buchenavia grandis Ducke
Buchenavia tomentosa (Mart.) Eichler
Combretum ellipticum Kuhlmann
Combretum fruticosum (Loefl.) Stuntz
Combretum leprosum Mart.
Combretum mellifluum Eichler
Combretum sp.
Terminalia argentea Mart. & Zucc.
Terminalia brasiliensis (Camb.) Eichler
Terminalia fagifolia Mart. ex Zucc.
Terminalia januariensis DC.
Terminalia phaeocarpa Eichler
Terminalia spp 2
Thilsea glaucocarpa (Mart.) Eichler
Unknown 1
Connaraceae
Connarus perrottetii (DC.) Planch.
Connarus suberosus Planch.
Connarus spp. 4
Rourea induta Planch.
Convolvulaceae
Ipomoea albiflora Moric.
Ipomoea sp.
Merremia aturensis (Kunth) Hallier
Cunoniaceae
Lamanonia ternata Vell.
Dilleniaceae
Curatella americana L.
Davilla cearensis Huber
Davilla elliptica A. St.-Hil.
Davilla grandiflora A. St.-Hil. & Tul.
Davilla aff. multiflora A. St.-Hil.
Davilla rugosa Poir.
Davilla sp.
Ebenaceae
Diospyros brasiliensis Mart.

Table 2. Continued.

Diospyros burchellii Hiern
Diospyros coccolobaefolia Mart.
Diospyros hispida A. DC.
Diospyros sericea A. DC.
Diospyros spp. 2
Maba inconstans (Jacq.) Griseb.
Ericaceae
Gaylussacia brasiliensis Meisn.
Gaylussacia pseudo-gaultheria Cham. & Schltdl.
Leucothoe pohlil (Don) Sleumer
Leucothoe serrulata DC.
Erythroxylaceae
Erythroxylum ambiguum Peyr.
Erythroxylum campestre A. St.-Hil.
Erythroxylum citrifolium A. St.-Hil.
Erythroxylum cuneifolium (Mart.) O. E. Schulz
Erythroxylum daphinites Mart.
Erythroxylum deciduum A. St.-Hil.
Erythroxylum engleri O. E. Schulz
Erythroxylum flexuosum O. E. Schulz
Erythroxylum gonocladum (Mart.) O. E. Schulz
Erythroxylum aff. micranthum Bong. ex Peyr.
Erythroxylum orinocense Kunth
Erythroxylum cf. orinocense Kunth
Erythroxylum aff. rufum Cav.
Erythroxylum strobilaceum Peyr.
Erythroxylum suberosum A. St.-Hil.
Erythroxylum tortuosum Mart.
Erythroxylum spp. 9
Euphorbiaceae
Actinostemon communis (Müll. Arg.) Pax
Alchornea discolor Endl. & Poepp.
Alchornea schomburgkii Klotzsch
Alchornea triplinervia (Spreng.) Müll. Arg.
Alchornea spp. 2
Chaetocarpus echinocarpus (Baill.) Ducke
Cnidoscylus vitifolius Pohl
Croton floribundus Spreng.
Croton pohlianus Müll. Arg.
Croton salutaris Casar.
Croton spp. 3
Mabea fistulifera Mart.
Mabea sp.
Manihot coerulescens Pohl
Manihot pruinosa Pohl
Manihot tripartita (Spreng.) Müll. Arg.
Manihot violacea Pohl
Manihot spp. 4
Maprounea brasiliensis A. St.-Hil.
Maprounea guianensis Aubl.
Maprounea sp.
Pera bicolor (Klotzsch) Müll. Arg.
Pera ferruginea (Schott) Müll. Arg.
Pera glabrata (Schott) Baill.
Pera obovata (Klotzsch) Baill.
Pera sp.
Sapium biglandulosum Müll. Arg.
Sapium marginatum (Müll. Arg.) Müll. Arg.
Sapium sp.
Savia dictyocarpa Müll. Arg.
Sebastiania bidentata (Mart.) Pax
Unknown 1

Table 2. Continued.

Fabaceae
Acosmium dasycarpum (Vogel) Yakovlev
Acosmium lentiscifolium Schott
Acosmium subelegans (Mohlenbr.) Yakovlev
Acosmium sp.
Aeschynomene paniculata Willd. ex Vogel
Amburana cearensis (Alemão) A. C. Sm.
Andira anthelmia (Vell.) J. F. Macbr.
Andira cuyabensis Benth.
Andira fraxinifolia Benth.
Andira inermis (Sw.) Kunth
Andira laurifolia Benth.
Andira legalis (Vell.) Toledo
Andira nanum
Andira paniculata Benth.
Andira cf. riverina Arroyo
Andira spectabilis Saldanha
Andira surinamensis (Bondt) Splitg. ex Pulle
Andira vermifuga Mart. ex Benth.
Andira spp. 7
Ateleia glazioviana Baill.
Bocoa mollis (Benth.) R. Cowan
Bowdichia nitida Spruce ex Benth.
Bowdichia virgilioides Kunth
Camptosema coriaceum (Nees & Mart.) Benth.
Camptosema pedicellatum Benth.
Centrolobium tomentosum Guill. ex Benth.
Clitoria sp.
Coursetia arborea Griseb.
Dalbergia miscolobium Benth.
Dioclea bicolor Benth.
Dioclea glabra Mart. ex Benth.
Dioclea huberii Ducke
Dioclea reflexa Hook. f.
Dipteryx alata Vogel
Dipteryx odorata (Aubl.) Willd.
Eriosema aff. congestum Benth.
Eriosema spp. 3
Galactia glaucescens Kunth
Harpalyce brasiliensis Benth.
Indigofera suffruticosa Mill.
Lonchocarpus araripensis Benth.
Lonchocarpus cf. sericeus (Poir.) Kunth
Luetzelburgia auriculata (Alemão) Ducke
Machaerium acutifolium Vogel
Machaerium aff. acutifolium Vogel
Machaerium arobreum (Jacq.) Vogel
Machaerium hirtum (Vell.) Stollfeld
Machaerium lanatum Tul.
Machaerium opacum Vogel
Machaerium stipitatum (DC.) Vogel
Machaerium villosum Vogel
Machaerium spp. 2
Ormosia arborea (Vell.) Harms
Platymiscium trinitatis Benth.
Platypodium elegans Vogel
Platypodium grandiflorum Benth.
Pterocarpus rohrii Vahl
Pterocarpus violaceus Vogel
Pterodon emarginatus Vogel
Tephrosia purpurea (L.) Pers.
Vatairea macrocarpa (Benth.) Ducke

Table 2. Continued.

<i>Vigna firmula</i> (Benth.) Maréchal, Mascherpa & Stainier
<i>Zollernia paraensis</i> Huber
Flacourtiaceae
<i>Banara</i> sp.
<i>Casearia arborea</i> (Rich.) Urb.
<i>Casearia commersoniana</i> Cambess.
<i>Casearia decandra</i> Jacq.
<i>Casearia gossypiosperma</i> Briq.
<i>Casearia grandiflora</i> Cambess.
<i>Casearia guianensis</i> (Aubl.) Urb.
<i>Casearia lasiophylla</i> Eichler
<i>Casearia sylvestris</i> Sw.
<i>Casearia</i> spp. 5
<i>Laetia procera</i> (Peoppig) Eichler
<i>Lindackeria latifolia</i> Benth.
<i>Ryania mansoana</i> Eichler
Hippocrateaceae
<i>Cheiloclinium cognatum</i> (Miers) A. C. Sm.
<i>Cheiloclinium</i> sp.
<i>Peritassa campestris</i> (Camb.) A. C. Sm.
<i>Salacia campestris</i> Walp.
<i>Salacia crassifolia</i> (Mart.) Peyr.
<i>Salacia micrantha</i> (Mart.) Peyr.
<i>Salacia</i> spp. 5
<i>Tontelea micrantha</i> (Mart. ex Schult.) A. C. Sm.
Unknown
Humiriaceae
<i>Humiria balsamifera</i> Aubl.
<i>Sacoglottis guianensis</i> Benth.
Icacinaeae
<i>Emmotum nitens</i> (Benth.) Miers
<i>Emmotum</i> sp.
Krameriaceae
<i>Krameria argentea</i> Mart. ex. Spreng.
<i>Krameria tomentosa</i> A. St.-Hil.
<i>Krameria</i> sp.
Lacistemataceae
<i>Lacistema aggregatum</i> (Bergius) Rusby
<i>Lacistema hasslerianum</i> Chodat
<i>Lacistema</i> sp.
Lamiaceae
<i>Hyptis cana</i> Pohl ex Benth.
<i>Hyptis eriophylla</i> Pohl ex Benth.
<i>Hyptis macrantha</i> A. St.-Hil. ex Benth.
<i>Hyptis pauliana</i> Epling
Lauraceae
<i>Mezilaurus crassiramea</i> (Meisn.) Taub. ex Mez
<i>Mezilaurus lindaviana</i> Schwacke & Mez
<i>Mezilaurus</i> aff. <i>lindaviana</i> Schwacke & Mez
<i>Nectandra lanceolata</i> Nees & Mart. ex Nees
<i>Nectandra membranacea</i> (Sw.) Griseb.
<i>Nectandra nitidula</i> Nees & Mart. ex Nees
<i>Nectandra</i> sp.
<i>Ocotea acutifolia</i> (Nees) Mez
<i>Ocotea corymbosa</i> (Meisn.) Mez
<i>Ocotea diospyrifolia</i> (Meisn.) Mez
<i>Ocotea</i> cf. <i>macropoda</i> (Humb., Bonpl. & Kunth) Mez
<i>Ocotea odorifera</i> (Vell.) Rohwer

Table 2. Continued.

<i>Ocotea pulchella</i> (Nees) Mez
<i>Ocotea spixiana</i> (Nees) Mez
<i>Ocotea velutina</i> (Nees) Rohwer
<i>Ocotea</i> spp. 10
<i>Persea caerulea</i> (Ruiz & Pav.) Mez
<i>Persea major</i> Kopp
<i>Persea pyrifolia</i> Nees & Mart. ex Nees
<i>Persea</i> sp.
<i>Phoebe erythrops</i> (Mart. & Spix) Mez
Unknown 12
Lecythidaceae
<i>Eschweilera brancoensis</i> (R. Knuth) Mori
<i>Eschweilera nana</i> (Berg) Miers
<i>Eschweilera</i> sp.
<i>Lecythis</i> sp.
Loganiaceae
<i>Antonia ovata</i> Pohl
<i>Mitreola</i> sp.
<i>Strychnos martii</i> Progel
<i>Strychnos pseudoquina</i> A. St.-Hil.
<i>Strychnos</i> sp.
Lythraceae
<i>Cuphea thymoides</i> Cham. & Schltdl.
<i>Cuphea</i> sp.
<i>Diplusodon ramosissimus</i> Pohl
<i>Diplusodon virgatus</i> Pohl
<i>Diplusodon</i> sp.
<i>Lafoensia densiflora</i> Pohl
<i>Lafoensia pacari</i> A. St.-Hil.
<i>Lafoensia puniciifolia</i> DC.
<i>Lafoensia replicata</i> Pohl
<i>Lafoensia</i> sp.
<i>Physocalymma scaberrimum</i> Pohl
Magnoliaceae
<i>Talauma ovata</i> A. St.-Hil.
Malpighiaceae
<i>Banisteria paraisia</i> *
<i>Banisteriopsis argiophylla</i> (A. Juss.) B. Gates
<i>Banisteriopsis campestris</i> (A. Juss.) Little
<i>Banisteriopsis clauseniana</i> (A. Juss.) W. R. Anderson & B. Gate
<i>Banisteriopsis irwiing</i> B. Gates
<i>Banisteriopsis laevifolia</i> (A. Juss.) B. Gates
<i>Banisteriopsis latifolia</i> (A. Juss.) B. Gates
<i>Banisteriopsis malifolia</i> (Nees & Mart.) B. Gates
<i>Banisteriopsis megaphylla</i> (A. Juss.) B. Gates
<i>Banisteriopsis oxyclada</i> (A. Juss.) B. Gates
<i>Banisteriopsis pubipetala</i> (A. Juss.) Cuatrec.
<i>Banisteriopsis schizoptera</i> (A. Juss.) B. Gates
<i>Banisteriopsis variabilis</i> B. Gates
<i>Banisteriopsis</i> spp. 4
<i>Byrsonima basiloba</i> A. Juss.
<i>Byrsonima blanchetiana</i> Miq.
<i>Byrsonima coccolobifolia</i> Kunth
<i>Byrsonima</i> aff. <i>coccolobifolia</i> Kunth
<i>Byrsonima coccolobifolia</i> f. <i>parvifolia</i> Nied.
<i>Byrsonima coriacea</i> (Sw.) Kunth
<i>Byrsonima crassa</i> Nied.
<i>Byrsonima crassifolia</i> Kunth
<i>Byrsonima cydoniifolia</i> A. Juss.
<i>Byrsonima fagifolia</i> Nied.

Table 2. Continued.

Byrsonima gautherioides Griseb.
Byrsonima guilleminiana A. Juss.
Byrsonima cf. guilleminiana A. Juss.
Byrsonima indorum S. Moore
Byrsonima intermedia A. Juss.
Byrsonima intermedia f. latifolia Nied.
Byrsonima lancifolia A. Juss.
Byrsonima laxiflora Griseb.
Byrsonima linguifera Cuatrec.
Byrsonima orbignyana A. Juss.
Byrsonima pachyphylla A. Juss.
Byrsonima schomburgkiana Benth.
Byrsonima sericea DC.
Byrsonima stipulacea A. Juss.
Byrsonima cf. umbellata Mart.
Byrsonima vacciniifolia A. Juss.
Byrsonima aff. vacciniifolia A. Juss.
Byrsonima variabilis A. Juss.
Byrsonima verbascifolia (L.) Rich. ex A. Juss.
Byrsonima verbascifolia ssp. discolor f. leiocarpa Griseb.
Byrsonima spp. 9
Galphimia brasiliensis (L.) A. Juss.
Heteropterys acutifolia A. Juss.
Heteropterys byrsonimifolia A. Juss.
Heteropterys cf. escalloniifolia A. Juss.
Heteropterys pteropetala A. Juss.
Heteropterys tomentosa A. Juss.
Heteropterys umbellata A. Juss.
Heteropterys xanthophylla A. Juss.
Heteropterys spp. 3
Peixotoa hirta A. Juss.
Peixotoa parviflora A. Juss.
Peixotoa sp.
Pterandra pyroidea A. Juss.
Tetrapterys ramiflora A. Juss.
Tetrapterys sp.
Unknown 3

Malvaceae

Hibiscus furcellatus Lam.
Mollia sp.
Pavonia malacophylla Garcke

Marcgraviaceae

Norantea guianensis Aubl.
Norantea sp.

Melastomataceae

Cambessedesia espora (A. St.-Hil.) DC.
Clidemia hirta (L.) D. Don
Clidemia rubra (Aubl.) Mart.
Clidemia sp.
Leandra involucrata DC.
Leandra lacunosa Cogn.
Leandra lancifolia Cogn.
Leandra polystachia (Naudin) Cogn.
Leandra purpurascens (DC.) Cogn.
Leandra cf. solenifera (Schränk ex DC.) Cogn.
Leandra cf. xanthopogon (Naudin) Cogn.
Leandra sp.
Macairea aff. calvescens Naudin
Miconia adenostemon Cogn.
Miconia albicans (Sw.) Triana
Miconia albo-rufescens Naudin

Table 2. Continued.

Miconia argentea DC.
Miconia burchellii Triana
Miconia chamissois Naudin
Miconia chartacea Triana
Miconia cinerea Cogn.
Miconia cinnamomifolia (Mart. ex DC) Naudin
Miconia cuspidata Naudin
Miconia fallax DC.
Miconia ferruginata (Schränk & Mart. ex DC.) DC.
Miconia guianensis (Aubl.) Cogn.
Miconia holosericea (L.) Triana
Miconia ibaquensis (Bonpl.) Triana
Miconia langsdorffii Cogn.
Miconia ligustroides (DC.) Naudin
Miconia minutiflora (Bonpl.) DC.
Miconia paulensis Naudin
Miconia pepericarpa DC.
Miconia pohliana Cogn.
Miconia rubiginosa DC.
Miconia rufescens (Aubl.) DC.
Miconia sellowiana (Cham.) Naudin
Miconia stenostachya (Schränk & Mart. ex DC.) DC.
Miconia theaezans (Bonpl.) Cogn.
Miconia tiliifolia Naudin
Miconia spp. 17
Mouriri acutiflora Naudin
Mouriri elliptica Mart.
Mouriri guianensis Aubl.
Mouriri pusa Gardner
Mouriri spp. 2
Ossaea congestiflora (Naudin) Cogn.
Tibouchina adenostemon (Schränk ex DC.) Cogn.
Tibouchina aspera Aubl.
Tibouchina barbigera (Naudin) Baill.
Tibouchina candolleana (Mart. ex DC.) Cogn.
Tibouchina cf. candolleana (Mart. ex DC.) Cogn.
Tibouchina clidemoides (Berg ex Triana) Cogn.
Tibouchina gracilis (Bonpl.) DC.
Tibouchina papyrifera (Pohl ex Naudin) Cogn.
Tibouchina pogonantha (Naudin) Cogn.
Tibouchina sellowiana (Cham.) Cogn.
Tibouchina stenocarpa (Schränk & Mart. ex DC.) Cogn.
Tibouchina spp. 2
Tococa formicaria Mart. ex DC.
Trembleya parviflora (D. Don) Cogn.
Trembleya phlogiformis (Mart. & Schränk ex DC.) DC.
Unknown 5

Meliaceae

Cabralea canjerana (Vell.) Mart.
Cabralea sp.
Cedrela fissilis Vell.
Guarea macrophylla Vahl
Trichilia elegans A. Juss.
Trichilia pallida Sw.
Trichilia sp.

Menispermaceae

Abuta grandifolia (Mart.) Sandwith
Abuta selloana (Benth.) Eichler
Cissampelos sp.

Mimosaceae

Acacia plumosa Lowe

Table 2. Continued.

Acacia sp.
Anadenanthera colubrina (Vell.) Brenan
Anadenanthera falcata (Benth.) Speg.
Anadenanthera macrocarpa (Benth.) Brenan
Anadenanthera peregrina (L.) Speg.
Calliandra abbreviata Benth.
Calliandra dysantha Benth.
Calliandra foliolosa Benth.
Calliandra microphylla Benth.
Calliandra parviflora Benth.
Chloroleucon dumosum (Benth.) G. P. Lewis
Chloroleucon foliolosum (Benth.) G. P. Lewis
Chloroleucon mangense (Jacq.) Britton & Rose
Enterolobium contortisiliquum (Vell.) Morong
Enterolobium gummiferum (Mart.) J. F. Macbr.
Enterolobium schomburgkii (Benth.) Benth.
Enterolobium spp. 2
Inga affinis DC.
Inga fagifolia (L.) Willd. ex Benth.
Inga heterophylla Willd.
Inga scabriuscula Benth.
Inga sessilis (Vell.) Mart.
Inga spp. 3
Mimosa acutistipula (Mart.) Benth.
Mimosa albolanata Taub.
Mimosa caesalpiniiifolia Benth.
Mimosa clausenii Benth.
Mimosa dolens Vell. ssp. rigida (Benth.) Barneby var. rigida
Mimosa foliolosa Benth.
Mimosa lanuginosa Glaz. ex Burkart
Mimosa laticifera Rizzini & A. Mattos
Mimosa millefoliata Scheele
Mimosa pithecolobioides Benth.
Mimosa platyphylla Benth.
Mimosa pteridifolia Benth.
Mimosa aff. somnians Humb. & Bonpl. ex Willd.
Mimosa sonderstromii Barneby*
Mimosa xanthocentra Mart. spp. subsericea (Benth.) Barneby var. subsericea
Mimosa verrucosa Benth.
Mimosa spp. 3
Parkia platycephala Benth.
Piptadenia gonoacantha (Mart.) J. F. Macbr.
Piptadenia obliqua (Pers.) J. F. Macbr.
Piptadenia sp.
Pithecellobium incuriale (Vell.) Benth.
Pithecellobium marginatum Spruce ex Benth.
Plathymenia foliolosa Benth.
Plathymenia reticulata Benth.
Stryphnodendron adstringens (Mart.) Coville
Stryphnodendron coriaceum Benth.
Stryphnodendron cf. coriaceum Benth.
Stryphnodendron obovatum Benth.
Stryphnodendron polyphyllum Mart.
Stryphnodendron spp. 2
Monimiaceae
Siparuna cujabana (Mart.) DC.
Siparuna guianensis Aubl.
Siparuna spp. 2
Unknown 1
Moraceae
Brosimum gaudichaudii Trécul

Table 2. Continued.

Brosimum guianensis (Aubl.) Huber
Brosimum spp. 2
Ficus citrifolia Mill.
Ficus gomelleira Kunth & Bouche ex Kunth
Ficus guyanensis Desv. ex Ham.
Ficus obtusifolia Humb., Bonpl. & Kunth
Ficus spp. 9
Pseudolmedia laevigata Trécul
Pseudolmedia sp.
Sorocea ilicifolia Miq.
Sorocea sprucei (Baill.) J. F. Macbr.
Sorocea sp.
Unknown 1
Myristicaceae
Virola malmei A. C. Sm.
Virola sebifera Aubl.
Virola sessilis (A. DC.) Warb.
Virola surinamensis (Rol.) Warb.
Virola spp. 3
Myrsinaceae
Cybianthus boissieri DC.
Cybianthus detergens Mart.
Cybianthus goyazensis Mez
Cybianthus sp.
Rapanea ferruginea (Ruiz & Pav.) Mez
Rapanea guyanensis Aubl.
Rapanea lancifolia (Mart.) Mez
Rapanea leuconeura (Mart.) Mez
Rapanea parvifolia (DC.) Mez
Rapanea umbellata (Mart.) Mez
Rapanea cf. umbellata (Mart.) Mez
Rapanea spp. 2
Stylogyne warmingii Mez
Unknown 2
Myrtaceae
Blepharocalyx salicifolius (Humb., Bonpl. & Kunth) Berg
Blepharocalyx sp.
Calycorectes acutatus (Miq.) Toledo
Campomanesia adamantium (Camb.) Berg
Campomanesia dichotoma (Berg) Mattos
Campomanesia eugenioides (Camb.) D. Legrand
Campomanesia lineatifolia Ruiz & Pavon
Campomanesia pubescens (DC.) Berg
Campomanesia rufa (Berg) Nied.
Campomanesia xanthocarpa Berg
Campomanesia spp. 4
Eugenia albo-tomentosa Camb.
Eugenia aurata Berg
Eugenia bimariginata DC.
Eugenia chrysantha Berg
Eugenia dysenterica Mart. ex DC.
Eugenia gamaeana Glaz.
Eugenia hiemalis Camb.
Eugenia livida Berg
Eugenia mansonii Berg
Eugenia cf. mansonii Berg
Eugenia aff. oblongata Berg
Eugenia obversa Berg
Eugenia pitanga (Berg) Kiaersk.
Eugenia pluriflora Mart.
Eugenia punicifolia (Humb., Bonpl. & Kunth) DC.

Table 2. Continued.

<i>Eugenia spathulata</i> Berg
<i>Eugenia uniflora</i> L.
<i>Eugenia</i> aff. <i>uniflora</i> L.
<i>Eugenia</i> spp. 24
<i>Gomidesia affinis</i> (Camb.) D. Legrand
<i>Gomidesia lindeniana</i> Berg
<i>Myrceugenia</i> aff. <i>alpigena</i> (DC.) Landrum
<i>Myrcia albo-tomentosa</i> DC.
<i>Myrcia bella</i> Camb.
<i>Myrcia canescens</i> Berg
<i>Myrcia castrensis</i> (Berg) D. Legrand
<i>Myrcia cuprea</i> (Berg) Kiaersk.
<i>Myrcia daphnoides</i> DC.
<i>Myrcia floribunda</i> Miq.
<i>Myrcia formosiana</i> DC.
<i>Myrcia guajavaefolia</i> Berg
<i>Myrcia hayneana</i> Berg
<i>Myrcia intermedia</i> (Berg) Kiaersk.
<i>Myrcia</i> aff. <i>intermedia</i> (Berg) Kiaersk.
<i>Myrcia laevigata</i> Berg
<i>Myrcia larutoteana</i> Camb.
<i>Myrcia lasiantha</i> DC.
<i>Myrcia lingua</i> Berg
<i>Myrcia longipes</i> (Berg) Kiaersk.
<i>Myrcia</i> cf. <i>longipes</i> (Berg) Kiaersk.
<i>Myrcia multiflora</i> (Lam.) DC.
<i>Myrcia nigro-punctata</i> DC.
<i>Myrcia obtusata</i> (Schauer) D. Legrand
<i>Myrcia pallens</i> DC.
<i>Myrcia polyantha</i> DC.
<i>Myrcia pubipetala</i> Miq.
<i>Myrcia rorida</i> (Berg) Kiaersk.
<i>Myrcia rostrata</i> DC.
<i>Myrcia rufipes</i> DC.
<i>Myrcia schottiana</i> Berg
<i>Myrcia stricta</i> (Berg) Kiaersk.
<i>Myrcia superba</i> Berg
<i>Myrcia</i> aff. <i>ternifolia</i> Berg
<i>Myrcia tomentosa</i> DC.
<i>Myrcia</i> aff. <i>tomentosa</i> DC.
<i>Myrcia</i> cf. <i>tomentosa</i> DC.
<i>Myrcia</i> cf. <i>torta</i> DC.
<i>Myrcia uberavensis</i> Berg
<i>Myrcia variabilis</i> DC.
<i>Myrcia venulosa</i> DC.
<i>Myrcia</i> spp. 20
<i>Myrcianthes pungens</i> (Berg) D. Legrand
<i>Myrciaria floribunda</i> (West ex Willd.) Berg
<i>Myrciaria</i> aff. <i>floribunda</i> (West ex Willd.) Berg
<i>Psidium acutangulum</i> DC.
<i>Psidium aerugineum</i> Berg
<i>Psidium australe</i> Camb.
<i>Psidium</i> aff. <i>australe</i> Camb.
<i>Psidium bergianum</i> (Nied.) Burret
<i>Psidium cambessedianum</i> *
<i>Psidium cinereum</i> DC.
<i>Psidium firmum</i> Berg
<i>Psidium guajava</i> L.
<i>Psidium guineense</i> Sw.
<i>Psidium myrsinoides</i> Berg
<i>Psidium rufum</i> DC.
<i>Psidium submetrale</i> McVaugh
<i>Psidium</i> spp. 19
<i>Siphoneugena densiflora</i> Berg

Table 2. Continued.

<i>Siphoneugena</i> spp. 2
Unknown 36
Nyctaginaceae
<i>Guapira graciliflora</i> (Mart. ex J. A. Schmidt) Lundell
<i>Guapira noxia</i> (Netto) Lundell
<i>Guapira opposita</i> (Vell.) Reitz
<i>Guapira subferruginea</i> (Mart.)
<i>Guapira tomentosa</i> (Casar.) Lundell
<i>Guapira</i> spp. 9
<i>Neea macrophylla</i> Britton
<i>Neea</i> aff. <i>macrophylla</i> Britton
<i>Neea spruceana</i> Heimerl
<i>Neea theifera</i> Oerst.
<i>Neea</i> spp. 2
Unknown 2
Ochnaceae
<i>Ouratea acuminata</i> (DC.) Engl.
<i>Ouratea castanaefolia</i> (DC.) Engl.
<i>Ouratea confertiflora</i> (Pohl) Engl.
<i>Ouratea cuspidata</i> (A. St.-Hil.) Engl.
<i>Ouratea fieldingiana</i> (Gardner) Engl.
<i>Ouratea floribunda</i> (A. St.-Hil.) Engl.
<i>Ouratea hexasperma</i> (A. St.-Hil.) Baill.
<i>Ouratea nana</i> (A. St.-Hil.) Engl.
<i>Ouratea schomburgkii</i> (Planch.) Engl.
<i>Ouratea spectabilis</i> (Mart.) Engl.
<i>Ouratea</i> spp. 4
Olacaceae
<i>Dulacia</i> sp.
<i>Heisteria densifrons</i> Engl.
<i>Ximenia americana</i> L.
Oleaceae
<i>Linociera hassleriana</i> Hassl.
Opiliaceae
<i>Agonandra brasiliensis</i> Miers
<i>Agonandra</i> sp.
Oxalidaceae
<i>Oxalis hirsutissima</i> Mart. & Zucc.
Piperaceae
<i>Piper</i> spp. 2
Poaceae
<i>Actinocladum verticillatum</i> (Nees) MacClure & Sonderstron
<i>Arundinaria cannavieira</i> Silveira
<i>Guadua</i> sp.
Unknown 1
Polygalaceae
<i>Bredemeyera altissima</i> A. W. Benn.
<i>Bredemeyera laurifolia</i> Klotzch
Polygonaceae
<i>Coccoloba grandifolia</i> Jacq.
<i>Coccoloba mollis</i> Casar.
<i>Coccoloba</i> cf. <i>mollis</i> Casar.
<i>Coccoloba</i> spp. 4
Proteaceae
<i>Euplassa inaequalis</i> (Pohl) Engl.
<i>Roupala brasiliensis</i> Klotzsch

Table 2. Continued.

Roupala montana Aubl.
Roupala spp 3
Rhamnaceae
Rhamnidium elaeocarpum Reissek
Rhamnus sphaerosperma Sw.
Rosaceae
Prunus brasiliensis (Cham. & Schltdl.) D. Dietr.
Prunus myrtifolia (L.) Urb.
Prunus sellowii Koehne
Rubus brasiliensis Mart.
Rubiaceae
Alibertia concolor (Cham.) K. Schum.
Alibertia edulis (L. C. Rich.) A. Rich.
Alibertia elliptica (Cham.) K. Schum.
Alibertia macrophylla (Mart.) K. Schum.
Alibertia cf. macrophylla (Mart.) K. Schum.
Alibertia obtusa K. Schum.
Alibertia sessilis (Vell.) K. Schum.
Alibertia cf. sessilis (Vell.) K. Schum.
Alibertia verrucosa S. Moore
Alibertia spp. 4
Amaioua guianensis Aubl.
Borojoa lanceolata (Cham.) Cuatrec.
Calycophyllum multiflorum Griseb.
Chimarrhis sp.
Chiococca nitida Benth.
Chomelia anisomeris Müll. Arg.
Chomelia obtusa Cham. & Schltdl.
Chomelia pohliana Müll. Arg.
Chomelia ribesioides Benth. ex A. Gray
Coccocypselum lanceolatum (Ruiz & Pav.) Pers.
Coussarea hydrangeaefolia (Benth.) Benth. & Hook. ex Müll. Arg.
Declieuxia lysimachioides Zucc. ex Schult. & Schult. f.
Faramea crassifolia Benth.
Faramea sp.
Ferdinandusa elliptica Pohl
Genipa americana L.
Genipa sp.
Guettarda angelica Mart. ex Müll. Arg.
Guettarda platypoda DC.
Guettarda viburnoides Cham. & Schltdl.
Guettarda sp.
Ixora gardneriana Benth.
Ladenbergia chapadensis S. Moore
Palicourea crocea (Sw.) Roem. & Schult.
Palicourea rigida Kunth
Palicourea rigida var. genuina Müll. Arg.
Palicourea xanthophylla Müll. Arg.*
Palicourea sp.
Psychotria carthagenensis Jacq.
Psychotria officinalis (Aubl.) Rausch. ex Sandw.
Psychotria sessilis (Vell.) Müll. Arg.
Psychotria spp. 2
Randia nitida (Humb., Bonpl. & Kunth) DC.
Randia sp.
Remijia amazonica K. Schum.
Remijia ferruginea (A. St.-Hil.) DC.
Rudgea amazonica Müll. Arg.
Rudgea viburnoides (Cham.) Benth.
Rudgea villosa Benth. ex Glaz.
Rudgea sp.

Table 2. Continued.

Sabicea cana Hook. f.
Sipanea sp.
Tocoyena bullata (Vell.) Mart.
Tocoyena aff. foetida Poepp. & Endl.
Tocoyena formosa (Cham. & Schltdl.) K. Schum.
Tocoyena neglecta N. E. Brown
Tocoyena spp. 2
Unknown 6
Rutaceae
Dictyoloma incanescens DC.
Erythrochiton brasiliensis Nees & Mart.
Esenbeckia febrifuga (A. St.-Hil.) A. Juss. ex Mart.
Esenbeckia pumila Pohl
Fagara sp.
Hortia brasiliensis Vand. ex DC.
Spiranthera odoratissima A. St.-Hil.
Zanthoxylum cinereum Engl.
Zanthoxylum cf. cinereum Engl.
Zanthoxylum aff. hasslerianum (Chodat) Pirani
Zanthoxylum cf. hasslerianum (Chodat) Pirani
Zanthoxylum rhoifolium Lam.
Zanthoxylum cf. rhoifolium Lam.
Zanthoxylum riedelianum Engl.
Zanthoxylum rugosum A.-St. Hil. & Tul.
Sapindaceae
Allophylus quercifolius (Mart.) Radlk.
Allophylus sericeus (Camb.) Radlk.
Allophylus sp.
Cupania racemosa (Vell.) Radlk.
Cupania revoluta Radlk.
Cupania cf. scrobiculata Rich.
Cupania vernalis Camb.
Cupania spp. 2
Diatenopteryx sorbifolia Radlk.
Dilodendron bipinnatum Radlk.
Magonia pubescens A. St.-Hil.
Matayba arborescens (Aubl.) Radlk.
Matayba elaeagnoides Radlk.
Matayba guianensis Aubl.
Matayba sp.
Serjania erecta Radlk.
Unknown
Sapotaceae
Chrysophyllum brevipes (Pierre) T. D. Penn.
Chrysophyllum marginatum (Hook. & Arn.) Radlk.
Chrysophyllum sp.
Manilkara bidentata (A. DC) Chev.
Manilkara triflora (Alemão) Monach.
Manilkara spp. 2
Micropholis venulosa (Mart. & Eichler) Pierre
Pouteria ramiflora (Mart.) Radlk.
Pouteria torta (Mart.) Radlk.
Pouteria sp.
Sideroxylon aff. venulosum Mart. & Eichler
Unknown 1
Simaroubaceae
Simaba trichilioides Engl.
Simaba warmingiana Engl.
Simaba sp.
Simarouba amara Aubl.
Simarouba versicolor A. St.-Hil.

Table 2. Continued.

Solanaceae

Cestrum corymbosum Schltdl.
Cestrum obovatum Sendtn.
Cestrum sendtnerianum Mart. ex Sendtn.
Solanum baturitense Huber
Solanum cordifolium Dunal
Solanum grandiflorum Ruiz & Pavon
Solanum horridum Dunal
Solanum jamaicense Mill.
Solanum lycocarpum A. St.-Hil.
Solanum macranthum Dunal
Solanum subinerme Jacq.
Solanum spp. 2

Sterculiaceae

Guazuma ulmifolia Lam.
Helicteres brevispira A. St.-Hil.
Helicteres corylifolia Nees
Helicteres guazumifolia Kunth
Helicteres macropetala A. St.-Hil.
Helicteres ovata Lam.
Helicteres sacarolha A. St.-Hil.
Helicteres sp.
Melochia hirsuta Cav.
Sterculia striata A. St.-Hil. & Naudin
Sterculia sp.
Waltheria indica L.
Waltheria polyanthos K. Schum.

Styracaceae

Styrax camporum Pohl
Styrax ferrugineum Nees & Mart.
Styrax sp.

Symplocaceae

Symplocos fallax Brand
Symplocos lanceolata (Mart.) DC.
Symplocos cf. *lanceolata* (Mart.) DC.
Symplocos nitens (Pohl) Benth.
Symplocos platyphylla (Pohl) Benth.
Symplocos pubescens Klotzsch ex Benth.
Symplocos rhamnifolia DC.
Symplocos tenuifolia Brand
Symplocos tetrandra Mart. ex Miq.
Symplocos uniflora (Pohl) Benth.
Symplocos spp. 4

Theaceae

Ternstroemia brasiliensis Cambess.
Ternstroemia oleaefolia Wawra

Thymelaeaceae

Daphinopsis fasciculata (Meisn.) Nevling

Tiliaceae

Apeiba tibourbou Aubl.
Luehea divaricata Mart.
Luehea paniculata Mart.
Luehea speciosa Willd.
Luehea spp. 2
Triumfetta semitriloba Jacq.

Turneraceae

Piriqueta aurea (Cambess.) Urb.

Ulmaceae

Celtis iguanea (Jacq.) Sarg.
Celtis pubescens Kunth
Celtis sp.

Table 2. Continued.

Trema micrantha (L.) Blume

Velloziaceae

Vellozia flavicans Mart. ex Schult. f.
Vellozia spp. 2

Verbenaceae

Aegiphila amazonica Moldenke
Aegiphila intermedia Moldenke
Aegiphila lhotskiana Cham.
Aegiphila parviflora Moldenke
Aegiphila pernambucensis Moldenke
Aegiphila sellowiana Cham.
Aegiphila splendens Schauer
Aegiphila verticillata Vell.
Aegiphila sp.
Lantana camara L.
Lantana fucuta Lindl.
Lantana trifolia L.
Lippia corymbosa Cham.
Lippia eupatorium Schauer
Lippia glandulosa Schauer
Lippia gracilis Schauer
Lippia lacunosa Mart. & Schauer
Lippia lasiocalycina Cham.
Lippia lupulina Cham.
Lippia martiana Schauer
Lippia salviaefolia Cham.
Petrea racemosa Nees
Vitex cymosa Bertero
Vitex flavens Kunth
Vitex megapotamica (Spreng.) Moldenke
Vitex polygama Cham.
Vitex cf. *polygama* Cham.
Vitex schomburgkiana Schauer
Vitex spp. 2
Unknown 2

Vochysiaceae

Callisthene fasciculata Mart.
Callisthene hassleri Briq.
Callisthene major Mart.
Callisthene major var. *pilosa* Warm.
Callisthene microphylla Warm.
Qualea cordata Spreng.
Qualea densiflora Spreng.
Qualea dichotoma (Mart.) Warm.
Qualea grandiflora Mart.
Qualea multiflora Mart.
Qualea parviflora Mart.
Qualea sp.
Salvertia convallariodora A. St.-Hil.
Vochysia cinnamomea Pohl
Vochysia elliptica Mart.
Vochysia aff. *ferruginea* Mart.
Vochysia gardneri Warm.
Vochysia haenkeana Mart.
Vochysia herbacea Pohl
Vochysia petraea Warm.
Vochysia pruinosa Pohl
Vochysia rufa Mart.
Vochysia thyrsoides Pohl
Vochysia tucanorum Mart.
Vochysia spp. 2
Family unknown—122

Table 3. Numbers (N) of references to taxonomic entities at different levels found in surveys of trees and shrubs in Brazilian cerrados.

		N	%
Families			
Identified		88	41.9
"Unknown"		122	58.1
	Total	210	
Genera			
Identified		363	63.3
"Unknown"		209	36.5
	Total	572	
Species			
Identified		973	57.1
Dubious		31	1.8
Dubious, but species already identified at another site		36	2.1
Subspecies or variety of species already included		5	0.3
Genus only		455	26.6
"Unknown"		209	12.2
	Total	1709	

Table 4. Estimates of the number of taxa of arboreal and shrubby plants at different levels in Brazilian cerrados. See text for details on calculation.

Level	Lower limit	Upper limit
Families	88	210
Genera	363	572
Species	973	1709

Table 5. Estimates of the number of terrestrial herbaceous-subshrubby species and total terrestrial angiosperm flora of Brazilian cerrados, assuming different proportions (1:2 and 1:3) of woody:herbaceous-subshrubby components and considering a lower (minimum) and an upper (maximum) limit (see Table 4) for the woody flora.

	Minimum		Maximum	
	1:2	1:3	1:2	1:3
Herbaceous-subshrubby species	1946	2919	3418	5127
Total flora	2919	3892	5127	6836



Castro, Antônio Alberto Jorge Farias et al. 1999. "How Rich is the Flora of Brazilian Cerrados?" *Annals of the Missouri Botanical Garden* 86, 192–224.
<https://doi.org/10.2307/2666220>.

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