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Aptitude and potential of forest species for their implementation in silvopastoral systems in the Atlantic Forest region, Southeast Brazil sub-region

Aptitud y potencial de especies forestales para la implementación en sistemas silvopastoriles en la región de la Mata Atlántica, subregión Sudeste-Brasil

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Abstract
Based on species characterization and literature review information about „silvopastoral systems in the Atlantic Forest region, Southeast-Brazil“ was systematized. A list of native forest species, occurring in Rio de Janeiro, with positive characteristics for silvopastoral systems has been built, their main characteristic as family, genus, species, common name, wood density and common uses were also described. Those forest species have been reclassified according to their specific aptitudes for silvopastoral systems in i) forest species with high adaptation to special soil and radiation conditions, ii) forest species with positive physiological characteristics; iii) forest species with secondary production; iv) forest species with aptitude for ornamentation; v) forest species and their wood quality. Based on this classification the species were prioritized in a general ranking.

Key words
Silvopastoral Systems, forestal species of the Atlantic Forest, Rio de Janeiro Southeast-Brazil region.

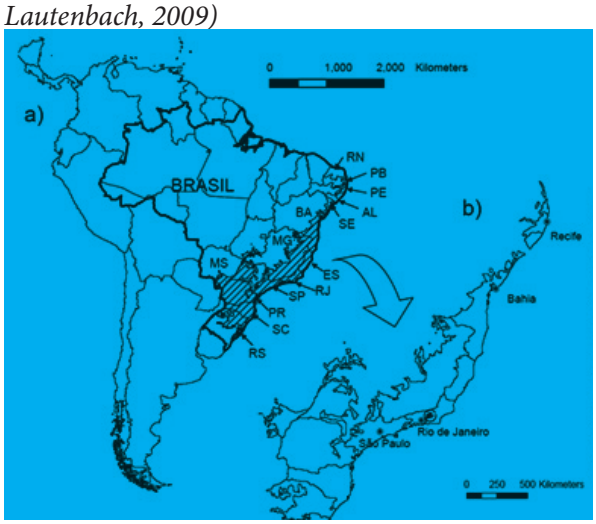
Resumen
En base a revision de literatura y caracterización de especies se ha sistematizado información sobre el tema “sistemas silvopastoriles en la región de la Mata Atlántica, subregión Sudeste-Brasil”, se han construido listas de especies forestales que crecen en esta region y principalmente en Rio de Janeiro, describiendo a la ves sus principales características como familia, genero, especie, nombre común, densidad de madera y usos. Estas especies forestales han sido clasificadas según sus aptitudes para sistemas silvopastoriles y subclasificadas en i) Especies forestales con alta adaptación a condiciones especiales de suelo y radiación, ii) especies forestales con características fisiológicas positivas; iii) especies forestales con producción secundaria; iv) especies forestales con aptitud para ornamentación; v) especies forestales y su calidad de maderaespecies con mayor potencial para sistemas silvopastoriles. En base a esta clasificación se priorizó las especies en un ranking general.

Palabras claves
Sistemas silvopastoriles, especies forestales Mata Atlantica, Rio de Janeiro region Sudeste-Brasil.

INTRODUCTION

In general, the spread of livestock in the Atlantic Forest and in Brazil was a process that led to negative impacts on biodiversity, soil quality, the availability and quality of water, etc. Forests were replaced at 80% by "Brachiaria" and "Melinis" pastures (Miranda et al., 1995, Torrico et al, 2009a), this fact led to soil degradation and loss of biodiversity (Sánchez, 2000, Daniel et al ., 2000). Approximately 60% of the area is covered by pastures and undergoing intense degradation processes (EMBRAPA-CNPAF, 1995). One of Embrapa's (Brazilian Agricultural Research Corporation) estimates suggests that there are 105 million hectares of planted pastures in Brazil, of which 8 million hectares are in the southern region (Zimmer y Euclid-Filho 1997). INPE (National Institute for Space Research) and SOS Mata Atlântica (1996) in their five-year study indicate that the remnants of forests in 1990 were 8.8%: in 2006 6.9% of primary and secondary forests at an advanced stage of recovery (SOS and INPE 2006). Of those remnants 43% are in the Southeast, 40.5% in the South, 15.5% in the Northeast and less than 1.0% in the Midwest (MMA, 2006, Figure 1).

Figure 1 - Mata Atlântica Brazil (Source: Raedig y Lautenbach, 2009)



The Atlantic Forest Biome is the great extra-Amazonian forest group, one of the richest groups of ecosystems in terms of biological diversity on the planet (Capobianco, 2002; Wesenberg, 2009). However, it is now recognized as the Brazilian biome that has lost its distinctive features to the greatest extent (Ryland y Rodriguez, 1996). This ecosystem has a high number of endemic plants, more than 8,000 of an estimated 20,000 species of plants (40%) are thought to be endemic (Brooks et al., 2002; Mittermeier et al. 2004; Mittermeier et al., 2005; Wesenberg, 2009).

The Atlantic Forest is divided into two major floristic groups, one consisting of rainforests (dense and mixed with no marked climatic seasonality), and the other consisting of the semi-deciduous seasonal forest in regions with water deficit periods throughout the year (Oliveira Filho y Fontes, 2000). According to the classification of Veloso et al. (1991) the type of vegetation is dense rainforest, usually constituted by tall trees and linked to a hot and humid climate. In the southern and southeastern regions of Brazil, the Atlantic Forest designation comprises three distinct forest formations, both in origin and physiognomic aspects: a) coastal plain forests, b) hillside forests and c) montane forests (Joly et. al., 1990). The main remnants are concentrated in the states of the southern and southeastern regions, covering part of the Serra do Mar and Serra da Mantiqueira, where the occupation process is hampered by the rugged terrain and poor transport infrastructure (PDA Atlántica, 2002; Siqueira, 1994).

OBJECTIVES

Identify forest species with greater aptitude and potential for the implementation of silvopastoral systems in the Atlantic Forest region, Southeast-Brazil sub-region, based on literature review.

METHODOLOGY

This literature review is based on the evaluation and systematization of specialized publications with the topic, silvopastoral systems and forest species in the Atlantic Forest region. In order to prioritize species we proceeded to group species with a determined desired characteristic for silvopastoral systems. To construct the overall ranking a value of one was equally assigned to each desired property, i.e. „rapid growth", „sun tolerant", „shadow" etc. Finally, the units obtained for each species were added together.

The basic information for each species is presented with the following characteristics: family, genus, species, common name, wood density, and uses.

RESULTS

A silvopastoral system is an agricultural production system that combines pastures and trees, it could be a good alternative to reduce erosion, retain a modest amount of native trees and increase farmers‘ income (Torrico et al., 2009a). Among the benefits is the offer of environmental services: soil conservation, water regulation, promotion of carbon sequestration and increased biodiversity, and scenic beauty among others (Alavalapati et al., 2004). Financial benefits from firewood, poles, wood and fodder, which can generate increases in revenue between 15 and 35% for cattle farms (Holmann y Estrada 1997, Botero et al. 1999), grazing of vegetation reduces the risk of fire, between 60 and 70% of vegetal biomass can be used to feed cattle without entering into competition with human food (Ruiz, 1983). That‘s why Silvopastoral Systems are pointed as a solution to many of the problems inherent in pastures (Pagiola et al., 2004). Besides, they provide a decrease of the kinetic energy of rainwater and its erosive potential through the interception of tree tops, slowing wind velocity thus preventing wind erosion (Balieiro, F. et al, 2009).

Current Status of silvopastoral systems in the region, only traces and fragments of the Atlantic Forest can be found in the state of Rio de Janeiro, especially in the mountain region (Serra do Mar). It is also possible to find in national parks small protected patches located in private farms of local producers.

In 2003, almost 30% of a total area of 43,778 km2 that the State of Rio de Janeiro occupies corresponded to the Atlantic Forest (collection of primary and secondary formations), and almost 60% was occupied by pastures and livestock (Embrapa, 2003). Another independent organization indicates that 100% of the State of Rio de Janeiro once corresponded to the Atlantic Forest, and that only 19.2% remained by 2000 (SOS Mata Atlântica 2002). This leads to suggest that the current area dedicated to livestock surpasses 60% of the state area (Barreiro, 2009; Gaese et. Al, 2009).

From the biodiversity point of view, ecological farming systems, agroforestry and silvopastoral systems, and perennial crops help reduce the pressure on the fragments and deforested areas. Improving the water cycle and also having positive influence on the dispersion of fauna and flora. They offer better resources and habitat for the survival of plants and animals than livestock and horticultural systems. Also, they play an important role as biological corridors and buffering reserves. These systems are also introduced to a modest level of biodiversity in these depredated areas of the Atlantic Forest, where currently a perennial forage grass (Brachiaria decumbens) dominates over 35% of the surface (Torrico, et al., 2009b).

Pastures of this region are not in good health and undergo a continuous process of deterioration. Many initiatives are being implemented by the local government in order to reverse the land degradation process (Embrapa Solos, 1999). Among the factors that in one way or another lead to this progressive deterioration and threaten long-term sustainability of the pastures are: i) continual extraction of nutrients without fertilization ii) overgrazing iii) low diversity of forage species iv) poaching, v) transit v) heavy animal stomping vi) steep slopes vii) intense rainfall, among others (Embrapa Solos, 1999; Torrico, et al., 2009b, Barreiro, 2009, Gaese et al. 2009).

Cattle raising capability is questionable in the mountain town of Teresópolis (RJ) due to the edaphological prevalence, and topographic and climatic conditions. The initial ecological conditions were drastically modified and altered by human intervention, the adapted transformation of native vegetation to monoculture with less biomass production per area unit, and biological diversity. Pastures and stockbreeding are important and well known for the local economy and social communities; therefore, stockbreeding has to become a long-term sustainable system as well as improving related agribusiness in the region (Barreiro, 2009).

Significant areas of natural and planted pastures in Teresópolis have been in continuous production for over three decades after deforestation. However, it is necessary to consider certain risk factors for productive resources, whose effects are already visible and verifiable: soil compaction, generation of bare grass-free surfaces, due to trampling and overgrazing. These bare areas can take the shape of paths or not, and they can be observed in large hilly areas either in pastures or forests. The predominance of a single forage species (Brachiaria decumbens) evidences a low level of biodiversity, both in flora and fauna. The low biodiversity of pastures makes them more vulnerable to attacks of plagues and diseases, like pasture cicada (Deois flavopicta, Deois incompleta, Zulia entreriana) affecting both Brachiaria (B. decumbens) and elephant

grass (Pennisetum purpureum). Nevertheless, as yet there have been no registered attacks of cicadas in the pastures of Teresópolis. Field measurements have shown the low productivity of Brachiaria decumbens pastures in Teresópolis, a result of decades of grazing without applying fertilizers (Barreiro, 2009).

Forests and livestock present strong trade-offs that threaten the conservation of biodiversity. Cattle are the main cause of forest fragmentation in the Atlantic Forest, disrupting the dispersal of flora and fauna, and also leading to higher rates of soil erosion. Biodiversity in agricultural systems: Stockbreeding is the dominant system in Teresópolis with 74% of the total agricultural area of the basin. Horticultural systems are second in importance (24%), of which leafy vegetable systems are more important with 14%. The silvopastoral system reaches only 2% and ecological and organic farming less than 0.4% (Torrico, 2009b).

The implementation of silvopastoral systems is not only a simple and cheap alternative, but consequently, it also has a high positive ecological impact. Cattle productivity in pastures is directly related to forage potential, their ability to adapt to the ecosystem and especially to the adopted management.

Despite a high soil and climate aptitude for silvopastoral systems in the Atlantic Forest, they are not widely used and information about these systems is scarce. Some isolated studies such as the research of Embrapa Dairy Cattle indicating that rugged areas of the southeastern region of Brazil have the necessary conditions conducive to benefit from the integration of pastures with cultivated trees (Carvalho et al., 2000), demonstrate the high aptitude of this region for the silvopastoral systems. Torrico et al. (2009a) indicate the existence of silvopastoral systems in the region of Teresópolis on a percentage of less than 2%, whereas pastures (Brachiaria decumbens) occupy more than 31% of the area of this region. Barreiro (2009) indicates that pasture yield is very low and among other negative effects, it increases erosion. Torrico et al. (2009b) indicates that pasture yield in the montane region of the Atlantic Forest ranges between 0.5 to 1.5 tonnes of dry matter per hectare.

From the economic and ecological standpoint, Barreiro (2009) y Torrico et al. (2009) indicate the low sustainability of pastures and they consider silvopastoral systems as an alternative. Mezquita Carvalho et al. (2003) describe some of the benefits of planting trees in pastures such as erosion control; it improves utilization of rain water and soil fertility. The expansion of the agricultural frontier in the Atlantic Forest resulted in over 93% of deforestation allowing only the survival of some residual areas as forest fragments (Viana et al., 1997).

Current land use

The Atlantic Forest region was traditionally the main source of agricultural products for the coastal population; today the main industrial and silvicultural centers of Brazil are located in the area, as well as the major urban centers (SOS Mata Atlântica Foundation, 2001).

The Atlantic Forest is an environmental complex with an approximate area of 1,110,182 km2 (IBGE, 2004 figure 1), it is one of the most prominent and threatened ecosystems in the world. (Myers, 1990, Myers et al., 2000; Mittermeier et al., 2005; Torrico et al., 2009a). Brazil's occupation process caused a drastic reduction of its original vegetation coverage, today it is scattered along the Brazilian coast and within the regions of the south and southeast. Currently, forest cover is reduced to around 7.6% of the original. This environmental complex represents 13.04% of the total area of Brazil, encompassing mountain ranges, valleys, plateaus and plains in the entire eastern Atlantic continental strip of Brazil, apart from advancing on the Southern Plateau up to Rio Grande do Sul (IBGE , 2010: Portal Brasil 2010). It fully occupies Espírito Santo, Rio de Janeiro and Santa Catarina, 98% of Paraná and areas of the other 11 Units of the Federation (Siqueira, 1994). In 1994 the dense rainforest occupied 16.6% of the territory of the State of Rio de Janeiro (IBGE, 2010). The remaining areas are not evenly distributed across all the ecosystems of the biome, the greater part is located in conservation units or under pressure of rural activity or urban expansion (Ministerio do Meio Ambiente dos recursos hídricos e da Amazonia Legal).

Species potential and suitability for silvopastoral systems

Silvopastoral Systems that combine trees with pastures also have a component of animals, generally medium or small ruminants, mainly cattle and sheep. Cattle Agroforestry Systems are based on silvopastoral practices involving the presence of animals grazing under the trees. We suggest the implementation of Cattle Agroforestry Systems or Silvopastoral Systems in which nitrogen-fixing

trees and shrubs (legumes) could be associated with agricultural crops, pastures or could be alternately kept with pastures and crops, as well as protein banks or hedges (Russo and Botero, 2001).

In general, the main objectives of the integration of ruminants in the Silvopastoral Systems are: Producing animal protein without adding new areas to the production system; Reducing weeding costs of (sub-forest) understory species by grazing palatable species or stomping over the unpalatable ones; Reducing fire risk by preventing accumulation and dryness of herbaceous vegetation; Accelerating the nutrient cycling of biomass through deposition of feces and urine; and Providing additional revenue through increased land productivity (Guimarães et al., 2006).

The trees that constitute the Silvopastoral Systems maintain or improve the soil physical and chemical characteristics through the following processes: 1) increase of inputs (organic matter, atmospheric nitrogen fixation for legumes and nutrient absorption), 2) reduction of losses (organic matter, nutrients through recycle control and erosion), 3) the improvement of the soil's physical properties, including the ability to retain water, and 4) the beneficial effect on biological processes (nodulation and mycorrhizae) (Young, 1989). Trees can be natural or planted, for various purposes such as wood, industrial products, or with the double purpose of nutrition and shade for animals, thinking of animal production (Sanchez Rosales, 1999). Thus, the implementation of Cattle Agroforestry Systems would be an alternative for the recovery of degraded areas; it could also be an option to poor performance of animals raised on pastures and to promote sustainability of agricultural production. (Paciullo & Tavares de Castro, 2006)

Species with the greatest potential for silvopastoral systems

This ranking was prepared with existing online information, it is possible that many features are missing and assignment of values can be done in many ways, here we use 1 as standard value for each feature and 2 when this feature is outstanding. In the case of wood density, a value of 1 was assigned to species with a density greater than 0.85 g/cm3.

The most important evaluated variables were: 1. Wood density; 2. Lush foliage/flowering; 3. Ornamental flowers; 4. Provides ample shade; 5. For narrow streets; 6. Human consumption; 7. Beekeeping flowers, wildlife consumption; 8. Fast growth; 9. Pioneer, grows in open areas; 10. Tolerance to direct radiation; 11. Heliophilous plants; 12. Selective hygrophilous; 13. Xerophiles; 14. Dry terrain; 15. Damp terrain + riparian area; 16. Grows in degraded areas with low soil fertility; 17. Heterogeneous reforestation; Plans to recover degraded areas for permanent preservation; 18. Nitrifying species.

The Species that got the highest score, which does not directly mean that they are the best for silvopastoral systems, but rather that they meet many of the desirable characteristics and can be adapted to silvopastoral systems are shown in Table 1, and in more detail in the Annex 1.

DISCUSSION

To Garcia et al. (2004) the agroforestry system is also a form of integration and crop rotation in which the arboreal and herbaceous component (annual crops and forage) and the animals are present, in a form of simultaneous or stepped use. Large crop areas can be occupied the trees and the grass in the various forms of exploitation, in spatial and temporal regime.

In the southeastern region of Brazil the condition of pastures located in areas where the Atlantic Forest used to be present is poor. This biome was the first to be degraded in Brazil, showing areas with over a century of deforestation. The situation is exacerbated by the predominance of low soil fertility (Carvalho, 1998; Resende y Resende, 1996), rugged topography and heavy rainfall, causing erosion problems and misuse of rainwater. The integration of cultivated pastures with trees is presented as a viable option to reverse this problem and promote the sustainability of this and other ecosystems suffering from degradation problems (Souchier et.al., 2005).

In the Cerrado region it was discovered that native legume species "baru" (Dipterix alata) had a much more significant effect on soil fertility in a pasture of Brachiaria decumbens with "pequi" trees (Caryocar brasiliense), a non-leguminous native species (Mesquita Carvalho, 2003).

Revegetation of iron mines in the state of Minas Gerais (Brazil) has included fixing species Acacia holosericea, Acacia mangium, Bauhinia variegata, Caesalpinia peltophoroides, Cajanus cajan, Enterolobium contortisiliquum ("timbo", "pacara") and Leucaena leucocephala (Griffith y Toy, 2001).

Mesquita Carvalho et al., (2003) observed special

Table 1 - Ranking of species with the greatest potential for silvopastoral systems

Family	Genus	Specie	Common name	Ranking Points
Phytolaccaceae	Phytolacca	P. dioica L.	Cebolao,umbu,umbuzeiro,ceboleiro,bela-sombra,ombu,maria-mole,peudo,figueira	11
Leguminosae-Caesalpinoideae	Caesalpinia	C. ferrea var. ferrea	Juca, pau-ferro, ibira-obi, imira-ita	9
Annonaceae	Xilopia	X. sericea A. St.Hill.	Pindaiba-vermelha, pindaubuna-da-serra, embireira, pimenta-do-sertao, pimenta-do-mato	7
Apocynaceae	Peschiera	P. fuchsiaefolia (A.DC.) Miers	Leiteiro, leiteira	7
Caesalpinaceae	Bauhinia	B. forficata Link	Pata-de-vaca, casco-de-vaca, mororó, pata-de-boi, unha_de_boi, unha_de-vaca	7
leguminosae-Caesalpinoideae	Peltophorum	P. dubium	Canafistula, farinha-seca, faveira,sobrasil, tamboril-bravo,guarucaia, ibira-puita	7
Leguminosae-Papilionoideae (Fabacea)	Dalbergia	D. nigra (Vell) Allemao ex Benth.	Jacaranda-da-bahia, jacaranda-preto,cabiúna-rajada, cabiúna-do-mato, graúna, caviuno, jacaranda-cabiuna,jacaranda-una, pau-preto, jacarandazinho	7
Leguminosae-Papilionoideae (Fabacea)	Erythrina	E. velutina Willd.	Suina, mulungu, canivete, corticeiro	7
Leguminosae-Papilionoideae (Fabacea)	Lonchocarpus	L. guillemineaus (Tul) Malme	Falso-timbó,embira-de-sapo, guaiana, embira-de-carrapato, pau-de-carrapato, rabo-de-macaco	7
Melastomaceae	Tibouchina	T. mutabilis Cogn.	Cuipeúna, manacá-de-serra, jacatirao, flor-de-quaresma, jaguatira, pau-de-flor	7
Meliaceae	Guarea	G. guidonia	Marinheiro,camboata,carrapeta-verdadeira, acafroa, cedrao,cedro-bramco,jito,guaré, pau-bala,pau-desabao,tauva,peloteira	7
Leguminosae-Mimosoideae	Anadenanthera	A. peregrina	Angico-do-morro,angico-branco,panca-de-curtume,parica-da-terra-firme,angico-vermelho	7
Leguminosae-Mimosoideae	Mimosa	M. artemisiana Heringer&Paula	Jeruma-branca	7
Araliaceae	Dendropanax	D. cuneatus	María-mole	6
Euphorbiaceae	Alchornea	A. iricurana Casar	Tapia,tanheiro-de-folha-redonda, maria_mole, arariba, tamanqueiro	6
Euphorbiaceae	Mabea	M. fistulifera Mart.	Mamoninha-do-mato, canudeiro, canudo-de-cachimbo, mamoneira-do-mato	6
Euphorbiaceae	Pera	P. glabrata (Schott) Baill	Tabocuva,tamanqueira,seca-ligeiro,coracao-de-bugre	6
Lauraceae	Persea	P. perifolia Nees & Mart. Ex Nees	Macaranduba, canela-rosa, abacateiro-do-mato, pau-andrade	6
Lecythidaceae	Lecythis	L. listonis Cambess	Sapucaia,castanha_sapucaia.Sapucaia-vermelha, cumbuca-de-macaco, marmita-de-macaco, cacamba_do_mato	6
Leguminosae-Papilionoideae (Fabacea)	Platymiscium	P. floribundum Vogel	Sacambu, rabugem, jacaranda-do-litoral, jacaranda-rosa, jacaranda-vermelho	6
Myrtaceae	Plinia	P. edulis (Vell.) Sobral	Cambuca, cambucazeiro,cambuca-verdadeiro	6
Verbenacea	Aeiphila	A. sellowiiana Cham.	Tamanqueiro,minura,papagaio,pau-de-tamanco	6
Aquifoliaceae	Illex	I. ceracifolia Reissek	Congonha	6
Leguminosae-Mimosoideae	Balizia	B. pedicillaris (D C.) Barneby & J.W.Grimes	Juerana-branca,jaquarana,esponjeira	6
Leguminosae-Papilionoideae	Andira	A. legalis (Vell.) Toledo	Angelim-coco,angelim-doce,urarema,angelim-gigante	6
Leguminosae-Papilionoideae	Deguelia	D. hatschbachii Az.-Tozzi	Embireira,embira-de-sapo,pau-de-peneira	6
Myrtaceae	Psidium	P. rufum DC	Araca-roxo,araca-cagao,araca,perinha	6

positive effects on the soil of native species "angico-vermelho" (Anadenanthera macrocarpa), "jacarandá-branco" (Platypodium elegans), "vinhático" (Plathymenia foliolosa) and "angico-mirim" (Mimosa artemisiana) and exotic ones as acacia (Acacia mangium and Acacia auriculiformis).

The forests along the rivers can provide corridors for forest species, which play a key role in the conservation of diversity species (Metzger et al., 1997). Gallery forests are of fundamental importance for mammals, especially in closed areas, they increase the diversity of wildlife species forming corridors that allow forest-living species to cover large extensions and provide shelter, food and water to non-forest species. According to Gregory et al. (1991), riparian areas are commonly recognized as corridors for the movement of animals, but they also have significant potential in plant dispersion and during periods of rapid climate change, there is an increase in the dispersion due to a more favorable microclimate along the current valleys.

Cassinoides Tabebuia species (caixeta) shows high phytosociological parameters of density, frequency and dominance, indicating complete adaptation to soil conditions, which presents waterlogging throughout the year. The species: Bleparocalix salicifolius, Coussapoa microcarpa, Eugenia sp, Ilex dumosa, Marlieria tomentosa and Miconia cinerascens are also common in flooded regions.

Leite et al., (2010) observed a forest fragment located in the municipality of Serra – Espírito Santo State, Brazil, next to the Environmental Protection Area Estadual do Mestre Álvaro– a stretch floristic composition consisting of 111 species corresponding to 82 genera and 43 families. The richest families were Leguminosae (14) and Sapindaceae (8). In some parts in the region corresponding to the portion between elevations, there is a depression in the ground that floods during the rainy season, in that environment it is possible to find the species: Bactris setosa, Inga laurina, Xylopia serícea (phyto-physiognomically prominent in the area) and Sebastiana brasiliensis, composing the riparian forests (Rodriguez, 2000).

M. tenuiflora was the species less accepted by animals, being that it was not present in their diet before the experiment, its introduction is also the most recommended in unprotected pasture seedlings and in the presence of local cattle. The A. auriculiformis was the one with greatest height difference before and after grazing, whereas G. sepium is the less palatable one. The species braquiaria decumbens was the most adapted tree legume for implantation in pastures, considered among the variables: length and difference of sprouts before and after animal grazing, as well as the percentage of loss of length for the sprouts with and without grazing (Dias, et.al. 2007).

The "aroeira" (Schinus terebinthifolius Raddi) is a species with beekeeping value for honey production and pollen quality. With prolonged flowering, which runs from October to April (Reitz et al., 1983), does not seem to be preferred one by bees due to their white flowers and small drupes (which are grouped in dense and large eye-catching clusters) due to the frequency of visits it requires, especially when other species are blooming. Carvalho (1995) observed that "aroeira" flowers bloom from three months of age and can provide early revenue for the beekeeper.

Silvopastoral Systems in the subhumid tropics can improve cattle production due to the shade that trees provide (Restrepo et al., 2004, Souza de Abreu et al. 2000), the prolongation of the pasture production period and increased soil fertility (Belsky 1993).

Thermal quality was evaluated in the work of Martins et al. (2002) in Pirassununga (Sao Paulo) –from the psychrometric characteristics of microclimate created by natural shading– of Sapateiro (Pera glabrata), copaiba (Copaifera langsdorfii) and orelha de negro (Anadenanthera macrocarpa) species. It was concluded that the species with better shade quality are "angico" followed by "pau pereira", "copaiba" and "orelha de negro". Besides, angico's partial interception to light allows herbaceous species to grow on their top without reducing protein accumulation (Carvalho et al, 1997).

In the northwestern region of Rio de Janeiro State Radema Project has conducted a study on sustainable grazing systems, using planting practices for the recovery of degraded areas in uneven terrains of the Atlantic Forest Biome. The module „silvopastoral copse" (with a total area of 625 m^2) is located on the sun-exposure stage. This plot has a total area of 6 hectares, divided into three plots of 2 ha. Three copses were implanted in each plot. The first copse with Enterolobium contortisiliquum on the top of the hill; the second with Eucalyptus torelliana in the middle of the slope; and the third with Mangifera indica at the bottom of the hill. The seedlings of Enterolobium contortisiliquum

(orelha de negro) were inoculated with Rhizobium (Moya, 2004).

Growth assessment at different altitudes; in order to assess the growth of planted species height measures were conducted in all experimental plots. Measurements were made at 15 months (April 2003) and 21 months (November 2003).

Analyzing the results of the assessments in uniform and copse silvopastoral modules, it was verified that Eucalyptus torelliana trees present the greatest growth at a high altitude at "Tifton" plot. The rapid growth of E torelliana trees allowed the removal of fences 15 months after planting.

In both types of silvopastoral systems that were observed, cattle has already benefited from the shade provided by the Eucalyptus trees. The performance of contortisiliquum Enterolobium copses is satisfying. So far, the exotic nodule legume that has the best performance is Acacia mangium, in wooded strips established at the head recovery area, which is starting to be used in an increasing scale in Brazil for the rehabilitation of degraded soils and –once this function is achieved– it is replaced by more demanding native species (Moya 2004).

CONCLUSIONS

1. A ranking has been prepared taking into account 20 variables of desirable tree species for silvopastoral systems. The ranking was elaborated for native forest species inhabiting in Rio de Janeiro.

2. The 10 species identified in this study with the greatest potential for silvopastoral systems in the region of Rio de Janeiro are: Phytolacca dioica L., Caesalpinia ferrea mart. Ex Tul. Var. Ferrea, Xilopia sericea A. St.Hill., Peschiera fuchsiaefolia (A.DC.) Miers, Bauhinia forficata Link, Peltophorum dubium, Dalbergia nigra (Vell) Allemao ex Benth, Erythrina velutina Willd, Lonchocarpus guillemineaus (Tul) Malme and Tibouchina mutabilis Cogn.

3. A list with 185 forest species inhabiting in Rio de Janeiro has been obtained, and having desired characteristics for silvopastoral systems, this list can be evaluated in different ways against parameters, and it is possible to provide different values to the desired characteristics in order to make a pre-selection of species.

4. Being that this is a list based on literature review, it is recommended to do a field check of the true qualities and occurrence of species and their behavior in agroforestry or silvopastoral systems.

BIBLIOGRAPHY

Alavalapati, JRR; Shrestha, RK; Stainback, GA; Matta, JR. 2004. Agroforestry development: An environmental economic perspective. Agroforestry Systems 61:299- 310.

Balieiro, F.; Franco, A.; Dias, P.F.; Souto, S.M.y Campello, E.F.C. 2009. Sistemas Agrosilvopastoris: a Importancia das leguminosas arbóreas para as pastagens da regiao Centro-Sul. PESAGRO RIO, Embrapa agrobiologia Rio de Janeiro, Brasil. Grupo de Estudo de Nutricao de Ruminates. Departamento de Melhoramento e Nutricao Animal. Unesp Botucatu.

Barreiro, B.D. 2009. Sustainability analysis of the animal husbandry agribusiness in the municipality of Teresôpolis, Rio De Janeiro, Brazil. German Development Service – DED. En: Torrico, J.C.; Gaese, H. Wesenberg, J. Sattler, D. Heinrich, J. Nehren, U. Raedig, C. 2009. Biodiversity and land use systems in the fragmented Mata Atlantica of Rio de Janeiro. Cuvillier Verlag Göttingen. Internationaler Wissenchaftlecher Fachverlag.

Belsky, AJ; Amundson, RG; Duxbury, JM; Riha, S; Ali, A; Mwonga,SM. 1989. The effects of trees on their physical, chemical,and biological environments in a semi-arid savanna in Kenya.Journal of Applied Ecology 26:1005-1024.

Botero, J; Ibrahim, M; Bouman, B; Andrade, H; Camargo,JC. 1999. Modelaje de opciones silvopastoriles sostenibles para el sistema ganadero doble propósito en el trópico húmedo. Agroforesteria en las Américas 6(23):60-62.

Brooks, T. M.; Mittermeier, R. A.; Mittermeier, C. G.; Fonseca, G. A. B.; Rylands, B.; Konstant, W. R.; Flick, P.;Pilgrim, J.; Oldfield, S.; Magin, g. y Hilton-Taylor, c. 2002. Habitat loss and extinction in the hotspots of biodiversity. Conservation Biology 16: 909-923. En: Wesenberg, J, Seele,C.2009. Floristic-structural composition and diversity of tree and woody understorey vegetation in the Montane Atlantic Forest of the Serra dos Órgãos National Park, Teresópolis, RJ, Brazil.

Capobianco, J. P. R. Mata Atlântica. Conceitos, abrangência e área original. In: Schäffer, W. B.; Prochnow, M. A Mata Atlântica e você: como preservar,

recuperar e se beneficiar da ameaçada floresta brasileira. Brasília: APREMAVI, 2002.156 p.

Carvalho, D.A.; Oliveira-Filho, A.T.; Villela, E.A. y Gavilanes, M.L. 1995. Flora arbustivo-arbórea de uma floresta ripária no Alto Rio Grande em Bom Sucesso/MG. Acta Botanica Brasilica 9(2): 231-245.

Carvalho, M.M. 1998. Recuperação de pastagens degradadas em áreas de relevo acidentado. En: Dias, L.E.; Mello, J.W.V. (Ed.). Recuperação de áreas degradadas. Viçosa: UFV. p.149-161.

Carvalho, M.M.; Silva, J.L.O.; Campos Junior, B.A. Producao de matéria seca e composição mineral da forragem de seis gramíneas tropicais estabelecidad em um sub-bosque de angico-vermelho. Revista brasilera Zootecnia., 26(2): 213-218, 1997. En: Balieiro, F.; Franco, A.; Dias, P.F.; Souto, S.M.y Campello, E.F.C. 2009. Sistemas Agrosilvopastoris: a Importancia das leguminosas arbóreas para as pastagens da regiao Centro-Sul. PESAGRO RIO, Embrapa agrobiologia Rio de Janeiro, Brasil. Grupo de Estudo de Nutricao de Ruminates. Departamento de Melhoramento e Nutricao Animal. Unesp Botucatu.

Carvalho, M.M.; Xavier, D.F.; Alvim, M.J. 2000. Uso de leguminosas arboreas en la recuperacion y sustentabilidad de pasturas cultivadas. EMBRAPA, Ganado de Leche

Dias, P.F.; Souto, S. M.; Franco, A.A. 2007. Leguminosas arbóreas introduzidas em pastagem. 2007. Empresa de pesquisa agropecuária do estado de Rio de janeiro. Estacao experimental de Seropedica. Brasil

Embrapa 2009 Sistemas silvopastoriles 2009, Sistemas pastoriles: una oportunidad para el desarrollo sustentable. 1er congreso nacional. Posadas misiones. Mayo 2009.Embrapa florestas. Ministerio de Agricultura,Pecuaria e abastecimento.

EMBRAPA. 2003. Mapeamento do Uso Atual e Cobertura Vegetal dos Solos do Estado do Rio de Janeiro. Boletim de Pesquisa e Desenvolvimento 22, Brazil. Available under: http://www.cnps.embrapa.br. En: Barreiro, B.D. 2009. Sustainability analysis of the animal husbandry agribusiness in the municipality of Teresôpolis, Rio De Janeiro, Brazil.

Gaese H., Torrico J. C. , Wesenberg J. , Schlüter S. (eds.). 2009. Biodiversity and land use systems in the fragmented Mata Atlântica Rio de Janeiro. Göttingen: Cuvillier-Verlag.

Garcia, R.; Couto, l.; Andrade, c.m. et al.2004 sistemas silvipastoris na região sudeste: a experiência da CMM. En: Sistemas agroflorestais e desenvolvimento sustentável, Campo Grande. Disponible on line: http://saf.cnpgc.embrapa.br/publicacoes/22.pdf

Gregory, S.; Swanson, F.J.; McKee, W.A. ; Cummins, K.W. 1991. An ecosystem perspective of riparian zones – Focus on links between land and water. BioScience 41(8): 540-551.En: Meyer, S.T.; da Silva, A.F.; Junior, P.M.; Meira Neto, J.A.A. 2004. Composição florística da vegetação arbórea de um trecho de floresta de galeria do Parque Estadual do Rola-Moça na Região Metropolitana de Belo Horizonte, MG, Brasil

Griffith, J. J. ; T. J. Toy. 2001. Evolution in revegetation of iron-ore mines in Minas Gerais State, Brazil. Unasylva 52. Disponible en http:// www. f a o . o r g / D O C R E P / 0 0 4 / Y 2 7 9 5 e /Y2795e00. HTM.

Guimarães J.P.; Rodrigues, A.C.; Cavalcante E.; Junior, V.H. 2006 . Agroecologia e sistemas de produção orgânica para pequenos ruminantes. EMBRAPA agrobiologia, EMBRAPA caprinos.

Holmann, F; Estrada, RD. 1997. Alternativas agropecuarias en la Región Pacífico Central de Costa Rica: un sistema de simulación aplicable a sistemas doble propósito. In Lascano, CE; Holmann, F. Eds. Conceptos y metodologías de Investigación en Fincas con Sistema de Producción Animal de Doble Propósito. Cali, Colombia. P 134-152.

IBGE, 2010. Portal Brasil. Disponible em línea: www.brasil .gov.br

Joly, C.A.; Leitão-Filho, H.F.; Silva, S.M. O patrimônio florístico. Mata Atlântica. Editora Index. S.O.S Mata Atlântica, 1990.En:Estudo comparativo de dois métodos de amostragem fitossociológica em caixetais (floresta ombrófila densa permanentemente alagada).Vanini,A.1999. piracicaba Estado de São Paulo - Brasil

Leite, V.R.:Lopes, T.S.; Pereira, O.J.´2010. Florística do ecótono floresta de Restinga e Mata Atlântica de Tabuleiro no município de Serra (ES). Diponible em línea: http://www6.ufrgs.br/seerbio/ojs/index.php/rbb/article/viewFile/438/388

Martins, J.L.; Silva, I.J.O.; Fagnani, M.A.; Piedade, S.M.S. Avaliacao da qualidade térmica do sombreamento de algunas espécies arvoreas, e, condição de pastagem. En: Balieiro, F.; Franco, A.; Dias, P.F.; Souto, S.M.y Campello, E.F.C. 2009. Sistemas Ag-

rosilvopastoris: a Importancia das leguminosas arbóreas para as pastagens da regiao Centro-Sul. PESAGRO RIO, Embrapa agrobiologia Rio de Janeiro, Brasil. Grupo de Estudo de Nutricao de Ruminates. Departamento de Melhoramento e Nutricao Animal. Unesp Botucatu.

Mesquita Carvalho, M.; Ferreira Xavier, D.; Alvim, J.M. 2003. Comunicado técnico 39: Arborização melhora a fertilidade do solo em pastagens cultivadas: ISSN 1678-3131 Juiz de Fora, MG, Brasil.

Metzger, J.P.; Bernacci, L.C. ; Goldenberg, R. 1997. Pattern of tree species diversity in riparian forest fragments of different widths (SE Brazil). Plant Ecology 133: 135-152. En: Meyer, S.T.; da Silva, A.F.; Junior, P.M.; Meira Neto, J.A.A. 2004. Composição florística da vegetação arbórea de um trecho de floresta de galeria do Parque Estadual do Rola-Moça na Região Metropolitana de Belo Horizonte, MG, Brasil

Mittermeier, R. A.; Robles-Gil, P.; Hoffman, M.; Pilgrim, J. D.; Brooks, T. B.;Mittermeier, C. G.; Lamoreux, J. L. ; Fonseca, G. A. B. 2004. Hotspots revisited: earth's biologically richest and most endangered terrestrial ecoregions. CEMEX, Mexico City, Mexico.

Mittermeier, R.A.; Robles-Gil,P.; Hoffman, M.; Pilgrim,J.D. Brooks, T.B.; Mittermeier, C.G.; Fonseca, G.A. 2005. Hotspot revisited: eatht´s biologically richest and most endangered terrestrial ecoregions. University of Chicago Press. Chicago, USA.

Montagnini, F. 1992. Sistemas agroforestales- Principios y aplicaciones en los trópicos. Organización para Estudios Tropicales. San José, Costa Rica.

Moya, P. 2004. Sistemas pastoris sustentáveis utilizando práticas de plantio direto para recuperação de áreas degradadas em relevo movimentado do bioma mata atlântica na região Noroeste do estado do Rio de Janeiro. Projeto radema. Projeto de apoio ao desenvolvimento de tecnologias agropecuárias para o Brasil..

Myers, N. 1990. The biodiversity challenge: expanded hot spots analysis. The enviromentalist 10: 243-256.

Myers, N.Mittermeier, R.A.; mittermeier, C. G. ; Fonseca, G.A.B. 2000. Biodiversity hotspots for conservation priorities. Nature 403: 853-858.

Oliveira-Filho, A. T. ; Fontes, M. A. L. 2000. Patterns of floristic differentiation among Atlantic forests in southeastern Brazil, and the influence of climate. Biotropica 32: 793-810. En : . Raedig, C.;Lautenbach, C. 2009. Broad-scale angiosperm diversity in Brazil's Mata Atlântica: using monographic data to assess prospects for conservation

Paciullo, D.S.C.; de Castro, C.R.T. 2006. Sistema silvopastoril e pastagem exclusivade braquiaria para recria de novilhas leiteiras: massa de forragem, qulidadedo pasto, consumo e ganho de peso. Boletim de Pesquisa e Desenvolvimento 20. Juiz de Fora, MG. Brasil.

Pagiola, S., Agostini, P., Gobbi, J., de Haan, C., Ibrahim, M., Murgueitio, E., Ramírez, E., Rosales, M., Nulz. J. P. 2004. Paying for biodiversity conservation services. En: Environment Department Papers. Washington: World Bank. 37p. (World Bank. Environmental and Economic Series, 96).

PDA, Mata Atlântica. 2002. Ministério do Meio Ambiente, Secretaria de Coordenação da Amazônia,Secretaria de Biodiversidade e Florestas ,Núcleo Assessor de Planejamento da Mata Atlântica Subprograma de Projetos Demonstrativos .PROPOSTA Ações de Conservação da Mata Atlântica "PDA – Mata Atlântica"Brasilia.

Raedig, C.; Lautenbach, C. 2009. Broad-scale angiosperm diversity in Brazil's Mata Atlântica: using monographic data to assess prospects for conservation. En: Torrico, J.C.; Gaese, H. Wesenberg, J. Sattler, D. Heinrich, J. Nehren, U. Raedig, C. 2009 (a) The Dinamic of the Mata Atlantica En: Biodiversity and land use systems in the fragmented Mata Atlantica of Rio de Janeiro. Cuvillier Verlag Göttingen. Internationaler Wissenchaftlecher Fachverlag.

Reitz, R.; Klein, R.M. ; Reis, A. projeto madeira de Santa Catarina. Itajaí, Herbário Barbosa Rodrigues, 1978. 320p.

Resende, S.B.; Resende, M. 1996. Solos dos Mares de Morros: ocupação e uso. En: Alvarez, V.H.; Fontes, L.E.F.; Fontes, M.P.F. (Ed.). O solo nos grandes domínios morfoclimáticos do Brasil e o desenvolvimento sustentado. Viçosa: UFV, p.261-288.

Restrepo, C; Ibrahim, M; Harvey, C; Harmand, M; Morales, J. 2004. Relaciones entre la cobertura arbórea en potreros y la producción bovina en fincas ganaderas en trópico seco en Cañas, Costa Rica. Agroforestería en las americas no. 41-42:29-36.

Rodrigues, R. R.; Nave, A. G. 2000. Heterogeneidade florística das matas ciliares. In: Rodrigues, R. R.; Leitão Filho, H. F. (orgs.). Matas ciliares: con-

servação e recuperação. São Paulo: FAPESP. p.45-71. En : Leite,V.R.:Lopes, T.S.; Pereira, O.J.´2010. Florística do ecótono floresta de Restinga e Mata Atlântica de Tabuleiro no município de Serra (Espiritu Santo).

Ruiz, M.E., 1983.Avances en la investigación de sistemas silvo-pastoriles. En L. Babbar. Curso corto intensico practicas agorforestales con énfasis en la medición y evaluación de parámetros biológico y socioeconómico, Turrialba, costa Rica, CATIE.

Russo, R. O., Botero, R. B. 2001.Utilización de árboles y arbustos fijadores de nitrógeno en sistemas sostenibles de producción animal en suelos ácidos tropicales. In: Castillo, A. R. Producción de leche y carne en el Trópico Cálido: una realidad eficiente en el año 2001.

Ryland, A. B:;Rodriguez, E. Eds.1996. Neotropical primates. Volume 4, number 1,Marzo 1996. Anewsletter of the neotropicalsection of the IUCN/ SSC Primate specialist group.

Importância das Leguminosas Arbóreas na Recuperação de Áreas Degradadas e na Sustentabilidade de Sistemas Agroflorestais. Embrapa.

Sánchez, M.D. ; Rosales, M.M. 1999. Agroforestería para la producción animal en América Latina, FAO, Rome 1999. 515 p.

Siqueira, M.F.1994. Analise floristica e ordenação de especies arboreas da mata Atlantica atraves de dados binarios (1994). Biblioteca digital de UNICAMP. Instituto de Biologia.

SOS Mata Atlantica. 2002. Atlas dos remanescentes florestais da Mata Atlántica. Periodo 1995-2000. Relatório Final. Available under: http://www.sosmatatlantica.org.br/?secao=atlas. Consulted in January 2005. En: Barreiro, B.D. 2009. Sustainability analysis of the animal husbandry agribusiness in the municipality of Teresôpolis, Rio De Janeiro, Brazil.

SOS Mata Atlântica: A Mata Atlântica. Disponible en línea: http://www.sosma.org.br

Souchie, E.L.; Carneiro, E.F.; Ribeiro da Silva, E.M. ; Saggin-Júnior, O.J. ,2005. Arborização de pastagem na região da Mata Atlântica. Floresta y ambiente. V.12, n.2, p. 22 - 27, nov./dez. 2006

Souza de Abreu, MH. 2002. Contribution of trees to the control of heat stress in dairy cows and the financial viability of livestock farms in humid tropics. PhD. Thesis. Turrialba, CR, CATIE. p.irr.

Torrico, J.C.; Gaese, H. Wesenberg, J. Sattler, D. Heinrich, J. Nehren, U. Raedig, C. 2009 (a) The Dinamic of the Mata Atlantica En: Biodiversity and land use systems in the fragmented Mata Atlantica of Rio de Janeiro. Cuvillier Verlag Göttingen. Internationaler Wissenchaftlecher Fachverlag.

Torrico, J.C.; Janssens, M.; Gaese, H. 2009(b). Agrobiodiversity assessment in the atlantic rainforest of Brazil. University of Applied Sciences Cologne, Institute for Technology in the Tropics

Veloso, H.P.; Rangel Filho, A.L.R. ; Lima, J.C.A. 1991. Classificação da vegetação brasileira adaptada a um sistema universal. Ministerio da economia, fazenda e planejamento. Fundação instituto brasileiro de geografia e estatistica – IBGE. Diretoria de geociências. Departamento de recursos naturais e estudos ambientais. Rio de Janeiro, IBGE.

Viana, V. M. ;Tabanez, A.A.J.; Batista, J.l.F. 1997. Dynamics and restoration of forest fragments in Brazil's Atlantic Moist Forest. En: Bierregard, R. ; Laurance, W. (eds) Tropical forest remnants: Ecology, Management and Conservation of Fragment Communities. Chicago University. Press, Chicago. En: Manejo de la Regeneración Natural para la Formación de Sistemas Agroforestales Ganaderos. Disponible on line: http://www.cipav.org.co/pdf/red%20de%20agroforesteria/ Proyectos%20de%20investigacion/Regeneracion_Natural.pdf

Wesenberg. J; Seele, C. 2009. Floristic-structural composition and diversity of tree and woody understorey vegetation in the Montane Atlantic Forest of the Serra dos Órgãos National Park, Teresópolis, RJ, Brazil. En: Torrico, J.C.; Gaese, H. Wesenberg, J. Sattler, D. Heinrich, J. Nehren, U. Raedig, C. 2009. Biodiversity and land use systems in the fragmented Mata Atlantica of Rio de Janeiro. Cuvillier Verlag Göttingen. Internationaler Wissenchaftlecher Fachverlag.

Young, A., 1989. Agroforestry for soil conservation. Wallingford: C.A.B. International, 276p. Oliveira-Filho, A.T. 1989. Composição florística e estrutura comunitária da floresta de galeria do córrego da Paciência, Cuiabá (MT). Acta Botanica Brasilica 3(1): 91-112. En: Meyer, S.T.; da Silva, A.F.; Junior, P.M.; Meira Neto, J.A.A. 2004. Composição florística da vegetação arbórea de um trecho de floresta de galeria do Parque Estadual do Rola-Moça na Região Metropolitana de Belo Horizonte, MG, Brasil

ANNEX 1.

Table complete list and ranking of species with the greatest potential for silvopastoral systems

(1) Wood density (gr/cm3)
(2) Wood density for ranking
(3) Lush foliage/flowering
(4) Ornamental flowers
(5) Provides ample shade
(6) For narrow streets
(7) Human consumption
(8) Beekeeping flowers
(9) Util for Wildlife consumption
(10)Fast growth
(11)Pioneer
(12)Grows in open areas (Tolerance to direct radiation)
(13)Heliophilous plants
(14)Selective hygrophilous
(15)Xerophiles
(16)Dry terrain
(17)Damp terrain + riparian area
(18)Grows in degraded areas with low soil fertility
(19)Heterogeneous reforestation, plans to recover degraded areas for permanent preservation
(20)Nitrifying species
(21)TOTAL Ranking Points

FAMILY	GENUS	SPECIES	COMMON NAME	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
Phytolaccaceae	Phytolacca	dioica L.	cebolao,umbu,umbuzeiro,ceboleiro,bela-sombra, ombu, maria-mole, peudo,figueira					2		1		2	2	1		1	1					1		**11**
Leguminosae-Caesalpinoideae	Caesalpinia	ferrea mart. Ex Tul. Var. Ferrea	juca, pau-ferro, ibira-obi, imira-ita	1,22	1	1		1	1						1	1	1				1		1	**9**
Annonaceae	Xilopia	sericea A. St.Hill.	pindaiba-vermelha, pindaubuna-da-serra, embireira, pimenta-do-sertao, pimenta-do-mato						1			1			1	1		1	1		1			**7**
Apocynaceae	Peschiera	fuchsiaefolia (A.DC.) Miers	Leiteiro, leiteira						1			1		1	1	1					1	1		**7**
Caesalpinaceae	Bauhinia	forficata Link	pata-de-vaca, casco-de-vaca, mororó, pata-de-boi, unha de boi, unha de-vaca			1	1		1				1	1		1						1		**7**
leguminosae-Caesalpinoideae	Peltophorum	dubium	canafistula, farinha-seca, faveira,sobrasil, tamboril-bravo, guarucaia, ibira-puita	0,69		1		1					1	1		1						1	1	**7**
Leguminosae-Papilionoideae (Fabacea)	Dalbergia	nigra (Vell) Allemao ex Benth.	jacaranda-da-bahia, jacaranda-preto,cabiúna-rajada, cabiúna-do-mato, graúna, caviuno, jacaranda-cabiuna,jacaranda-una, pau-preto, jacarandazinho	0,87	1	1											1	1	1			1	1	**7**
Leguminosae-Papilionoideae	Erythrina	velutina Willd.	suina, mulungu, canivete, corticeiro				1	1	1			1				1				1			1	**7**
Leguminosae-Papilionoideae	Lonchocarpus	guillemineaus (Tul) Malme	falso-timbó,embira-de-sapo, guaiana, embira-de-carrapato, pau-de-carrapato, rabo-de-macaco			1								1		1			1		1	1	1	**7**
Melastomaceae	Tibouchina	mutabilis Cogn.	cuipeúna, manacá-de-serra, jacatirao, flor-de-quaresma, jaguatira, pau-de-flor	0,66		1	1							1	2	1						1		**7**
Meliaceae	Guarea	guidonia	marinheiro,camboata,carrapeta-verdadeira, acafroa, cedrao,cedro-bramco,jito,guaré, pau-bala,pau-desabao,tauva,peloteira	0,76		1		2				1				1	1					1		**7**
Leguminosae-Mimosoideae	Anadenanthera	peregrina	angico-do-morro,angico-branco,panca-de-curtume,parica-da-terra-firme,angico-vermelho	1,08	1						1			1		1	1	1					1	**7**
Leguminosae-Mimosoideae	Mimosa	artemisiana Heringer &Paula	jeruma-branca	0,91	1							1		1		1	1					1	1	**7**
Araliaceae	Dendropanax	cuneatus	maría-mole						1			1				1	1			1	1			**6**
Euphorbiaceae	Alchornea	iricurana Casar	tapia,tanheiro-de-folha-redonda, maria_mole, arariba, tamanqueiro	0,4				1						1		1	1			1	1			**6**
Euphorbiaceae	Mabea	fustulifera Mart.	mamoninha-do-mato, canudeiro, canudo-de-cachimbo, mamoneira-do-mato						1					1	1	1	1					1		**6**
Euphorbiaceae	Pera	glabrata (Schott) Baill	tabocuva,tamanqueira,seca-ligeiro,coracao-de-bugre			1						1		1		1				1		1		**6**
Lauraceae	Persea	perifolia Nees &Mart. Ex Nees	macaranduba, canela-rosa, abacateiro-do-mato, pau-andrade	0,68		1						1			1	1		1			1			**6**

FAMILY	GENUS	SPECIES	COMMON NAME	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
Lecythidaceae	Lecythis	pistonis Cambess	sapucaia,castanha_sapucaia.sapucaia-vermelha, cumbuca-de-macaco, marmita-de-macaco, cacamba_do_mato	0,88	1					1		1				1	1			1				**6**
Leguminosae-Papilionoideae (Fabacea)	Platymiscium	floribundum Vogel	sacambu, rabugem, jacaranda-do-litoral, jacaranda-rosa, jacaranda-vermelho	0,89	1	1	1										1					1	1	**6**
Myrtaceae	Plinia	edulis (Vell.) Sobral	cambuca, cambucazeiro,cambuca-verdadeiro	0,91	1	1		1		1		1					1							**6**
Verbenacea	Aeiphila	sellowiiana Cham.	tamanqueiro,minura,papagaio,pau-de-tamanco									1	1	1		1					1	1		**6**
Aquifoliaceae	Illex	ceracifolia Reissek	congonha	0,65					1		1	2								1		1		**6**
Leguminosae-Mimosoideae	Balizia	pedicillaris (D C.) Barneby &J.W.Grimes	juerana-branca,jaquarana,esponjeira										1	1		1	1					1	1	**6**
Leguminosae-Papilionoideae	Andira	legalis (Vell.) Toledo	angelim-coco,angelim-doce,urarema,angelim-gigante	0,87	1		1									1	1					1	1	**6**
Leguminosae-Papilionoideae	Deguelia	hatschbachii Az.-Tozzi	embireira,embira-de-sapo,pau-de-peneira	0,82			1						1	1		1						1	1	**6**
Myrtaceae	Psidium	rufum DC	araca-roxo,araca-cagao,araca,perinha	0,93	1				1	1		1				1	1							**6**
Annonaceae	Annona	cacans Warm.	corticao, araticum-cagao, araticum-de-paca, quaresma, corticeira, coracao de boi, anona-cagona, corticeiro									1	1	1		1					1			**5**
Araucariaceae	Araucaria	angustifolia (Bertol.) Kuntze	parana-pine, curi, curiúva.pinheiro-do-panama,cori,pinho-brasileiro							2		1		1		1								**5**
Bignoniaceae	Jacaranda	macrantha Cham.	Caroba, carobao				1						1	1		1						1		**5**
Bignoniaceae	Sparattosperma	leucanthum (Vell.) K. Schum.	caroba-branca(SP) cinco-chagas,cinco-folhas				1						1	1		1						1		**5**
Connaraceae	Connarus	regnellii	Camboata_da_serra						1			1				1	1					1		**5**
Euphorbiaceae	Croton	urucurana Baill	urucurana, sangra_d'agua, urucuana,											1		1	1			1		1		**5**
Euphorbiaceae	Micandra	elata Müll. Arg.	leiteiro-branco, arvore-de-mamona			1							1	1			1					1		**5**
Euphorbiaceae	Savia	dictyocarpa	guaraiuva,aracazeiro(SC) goiaba_do_mato	0,9	1	1		1								1						1		**5**
Euphorbiaceae	Sebastiana	commersoniana(Baill.) L.B.Sm.&Downs	branquillo, branquinho,branquio	0,63										1		1	1			1		1		**5**

FAMILY	GENUS	SPECIES	COMMON NAME	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
Lauraceae	Nectandra	lanceolata Nees & Mar.ex.Nees				1	1					1								1		1		**5**
Lauraceae	Ocotea	corymbosa (Meins.) Mez	Canela-corvo, canela-fedida, canela-puante, canela_preta			1								1		1		1			1			**5**
Lauraceae	Ocotea	purubela (Rich.) Nees	guaicá, canela-guaica,canela-sebo, canela-parda, canela-de-corvo,canela-pimiento	0,45					1			1		1		1						1		**5**
Leguminosae-Caesalpinoideae (Mimosaceae)	Piptadenia	gonoacantha (Mart.) J.F. Macbr.	pau-jacaré, jacaré, angico-bramco,monjoleiro, monjolo,icarapé, casco-de-jacaré	0,75									1			1	1					1	1	**5**
Moraceae	Ficus	guaranitica Schodat	figueir-branca,figueira,mata-pau, figueira-mata-pau			1		2				1				1								**5**
Myrtaceae	Psidium	guajava	guava,guayaveiro,goiaba,goiaba-pera,goiaba-branca,goiaba-vermelha,araca-goiaba	0,8						2						1	1					1		**5**
Palmae (Arecaceae)	Syagrus	romanzoffiana							1			1				1	1					1		**5**
Rutaceae	Dictyoloma	vandellianum	tingui-pretp,tingui				1						2	1		1								**5**
Verbenacea	Vitex	polygama	taruma-do-cerrado,maria-preta,marianeira,taruma, mameira,maria-preto						1			1		1		1						1		**5**
Annonaceae	Guatteria	nigrenscens Mart.	pindaiba-preta	0,59					1			2				1					1			**5**
Cecropiaceae	Cuossapoa	microcarpa (Schot) Rizzini	figueira,figueira-mata-pau,figueira-de-brejo,figueira-preta	0,59					1			1	1			1	1							**5**
Clethaceae	Clethra	scabra Pers.	caujuja, guapare,carne-de-vaca, pau-de-cinzas,peroba-branca	0,53									1	1		1		1				1		**5**
Compositae	Stifftia	parviflora	estifia-branca	0,62					1				1			1	1					1		**5**
Flacourtiaceae	Casearia	lasiophylla Eicher	cambroe								1	1				1	1			1				**5**
Leguminosae-Mimosoideae	Abarema	jupumba (Willd) Britton& killip	ingarana,angelim-flaso,saboreiro,contas-de-nossa-senhora,tento-azul	0,78												1	1	1				1	1	**5**
Leguminosae-Mimosoideae	Inga	cylindrica (Vell.) Mart.	ingá,ingá-feijao	0,48								1		1		1	1						1	**5**
Leguminosae-Mimosoideae	Parapiptadenia	pterosperma (Benth.) Brenan	angico-roxo,angico-de-flor-roxa	0,98	1						1					1		1					1	**5**
Nyctaginacea	Andradae	floribunda Allem.	serina,siriba,tapaciriba-amarela,batao,casca-doce					1						1		1	1					1		**5**

FAMILY	GENUS	SPECIES	COMMON NAME	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
Rubiaceae	Ixora	gardneriana Benth.	ixora-arborea	0,88	1		1					1				1					1			**5**
Apocynaceae	Aspidosderma	ramiflorum Müll. Arg.	matiambu, guatambu-amarelo,peroba amarelo,pequía						1			1				1					1			**4**
Bignoniaceae	Tabebuia	vellosoi Toledo	ipe-amarelo, cavata, ipe-preto, ipe-una, pau-d'arco.piuva,quiarapaíba	0,99	1	1	1									1								**4**
Bombacaceae	Pseudobombax	grandiflorum (Cav.) A. Robyns	embirucu, embirucu_da_mata, paina_amarela, paina_de_arpoadro, cedro_d'agua	0,39		1									1	1						1		**4**
Elaeocarpaceae	Sloanea	monosperma Vell.	sapopema,laranjeira-do-mato,ourico,sacopema,carrapicho_arvore,carrapicheri	0,88	1			1								1						1		**4**
Guttiferae	Simphonia	globulifera L.	anani,pitia-de-lagoa,uanani,pau-breu,aonani,guarandi	0,74								1				1	1			1				**4**
Leguminosae-Papilionoideae	Erythrina	verna Vell.	suina,mulungu			1								1		1							1	**4**
Leguminosae-Papilionoideae	Machaerium	stipatum (DC.) Vogel	sapuvinha,sapuva,sapuvucu,pau-de-malho,jacaranda-roxo			1								1								1	1	**4**
Leguminosae-Papilionoideae	Swartzia	langsdorffi Raddi	pacova-de-macaco, jacaranda-banana,jacaranda-de-sangue			1						1										1	1	**4**
Moraceae	Ficus	insipida willd.	figueira-do-brejo, figueira,mata-pau													1	1			1		1		**4**
Palmae (Arecaceae)	Acronomia	aculesta (Jacq.) Lodd. Ex Mart.	macauba,coco-de-catarro,coco-de-espinho,coco,baboso,macaiba,macajuba,macabeira,mucaia,mucajuva							2				1		1								**4**
Podocarpaceae	Podocarpus	iambertii	pinheiro-bravo,pinho-bravo,pinheiro-do-mato,atambu-acu	0,45								1		1		1						1		**4**
Rosaceae	Prunus	sellowii Koehne	pessegueiro-bravo,miguel-pintado,coracao-de-negro,marmelo-do-mato,coracao-de-bugre	0,92	1				1			1										1		**4**
Sapindaceae	Allophilus	edulis(A.St. Cambess & A.Juss.)	chal-vhal, vacum, chal-chala, baga-de.morego,fruto-de-pomo,fruta-de-pavó						1			1		1			1							**4**
Apocynaceae	Malouetia	cestroides (Nees ex. Mart	peroba-de-leite,leiteira,paina	0,59										1		1				1		1		**4**
Caricaceae	Carica	quercifolia (A.St-Hil.) Hieron	mamoeiro-do-mato, mameirinho,mamaozinho, mamao-do-mato							1						1	1					1		**4**
Hippocrateceae	Salacia	elliptica (Mart.ex. Roem&Schult.)	siputa,saputa,bacupari	0,76				1		1						1	1							**4**

FAMILY	GENUS	SPECIES	COMMON NAME	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
Lecythidaceae	Lecythis	lanceolata Poir.	sapucaia-mirim,sapicaia-miuda,sapucaia,sapucaiu	1,01	1							1				1		1						**4**
Leguminosae-Caesalpinoideae	Peltogyne	confertiflora (Mart. Ex Hayne)	pau-roxo,jatobá-d'anta,jatobá-roxo,coracao-negro,	0,95	1											1		1					1	**4**
Leguminosae-Mimosoideae	Enterolobium	schomburgkil (Benth)	tamboril, sucupira-amarela, timburi,faveira-orelha-de-macacao, fava-de-rosca, timborana,faveca, favela, fava-uingue	0,79								1				1	1						1	**4**
Leguminosae-Caesalpinoideae	Platymiscium	pubescens Micheli	jacaranda-branco													1	1					1	1	**4**
Nyctaginacea	Guapira	opposita Vell.	maria-mole,maria-faceira,joao-mole,carne-de-vaca, flor-de-perola	0,41								1				1	1					1		**4**
Rubiaceae	Alseis	floribunda Schott	quina-de-san.paulo,falsa-pelada		1				1			1				1								**4**
Sapindaceae	Toulicia	laevigata Radlk.	cheiro-de-barata	0,9	1				1							1		1						**4**
Anacardiaceae	Schinus	molle L.	aroeira-salso, aroeira-salsa, aroeira-folha-de-salso,aroeira-mole,corneiba,corneita,ancauíta, fruto-de-sabiá, aroeira-periquita, pimenteiro, terbinto,bálsamo						1						1	1								**3**
Anacardiaceae	Spondias	mombin L.	taperebá,taperibá,cajazeiro,cajá-pequeno,cajazeiro-miudo, acaíba, acaja, acajaíba, imbuzeiro	0,41						1						1	1							**3**
Anacardiaceae	Tapirira	gueinensis Aubl.	jobo, tapiriri, tapirirá,copiúva, guapiruba, cedrói, aroeirana, fruto-de-pombo,tatapiririca (PA), cupiúva (PE)	0,51								1				1				1				**3**
Bignoniaceae	Tabebuia	heptaphylla (Vell.) Toledo	ipe,ipe-roxo,ipe-roxo-de-sete-folhas, pau-d'arco-roxo						1							1						1		**3**
Bombacaceae	Chorisia	speciosa A. St.-Hil	paineira-rosa, paineira, barriguda, arvor-de-la, painera-femea				1									1	1							**3**
Boraginaceae	Cordia	superba Cham.	babosa-branca, acoará-muru, carapia, grao_de_porco, jangada_do_campo (SP)			1						1					1							**3**
Cecropiaceae	Cecropia	hololeuca	embauvá-prateada, embauva.preta	0,43		1						1				1								**3**
Compositae (Asteraceae)	Stifftia	chrysantha Mikan	diadema, rabo_de_cutia, esponja, flor-da_amizade,pincel, esponja-de-ouro				1										1			1				**3**
Euphorbiaceae	Croton	floribundus Spreng	capixingui, tapixigui,velame, capexingui											1		1						1		**3**
Lecythidaceae	Cariniana	legalis (Mart.) Kuntze	jequitiba-rosa, jequitiba-vermelho,jequitiba-cedro, pau-carga,congolo-de-porco, caixao	0,53											1	1						1		**3**

FAMILY	GENUS	SPECIES	COMMON NAME	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
Leguminosae-Caesalpinoideae	Caesalpinia	peltophoroide Benth.	sibupirina, pau-brasil,sebipira, coracao-de-negro						1							1							1	**3**
Leguminosae-Mimosoideae (Mimosacea)	Plathymenia	foliosa Benth.	vinhatico, vinhatico-da-mata, vinhatico-rajado, pau-de-candela	0,5		1										1							1	**3**
Leguminosae-Papilionoideae	Machaerium	paraguaniense Hassl.	catereté, jacaranda-branco											1								1	1	**3**
Myrtaceae	Campomanesia	guazumifolia (Cambess)O.Berg	sete-capotes,sete-capas,sete-casacas,aracazeiro-grande							1		1										1		**3**
Palmae (Arecaceae)	Attalea	dubia	indaiá,palmeira-indaia,coqueiro,indaia,palmito-de-chao,inaia,naia,camarinha													1	1					1		**3**
Sapotaceae	Pouteria	torta (Mart.) Radk.	abiu-piloso,curiola,guapeva,aca, grao-de-galo,guapeba	0,78						1						1						1		**3**
Simaroubaceae	Simarouba	amara Aubl.	marupa,aruba, marubaá,paraiba,simaruba	0,38								1				1	1							**3**
Sterculiaceae	Pterigota	brasilliensis Allemao	pau-rei,farinha-seca,maperoa										2							1				**3**
Verbenacea	Aloysia	virgata (Ruiz & Pav.) Juss	lixa,lixeira						1							1		1						**3**
Annonaceae	Spondias	macrocarpa Engl.	caja redondo,cajazeiro								1	1					1							**3**
Bixaceae	Bixa	arborea Huber	urucu-arboreo,urucu-da-mata,urucurana-da-mata	0,47		1	1															1		**3**
Celastraceae	Maytenus	robusta Reissek	cafezinho,coracao-de-bugre,seca-ligeiro	0,77					1			1										1		**3**
Lauraceae	Mezillaurus	crassiramea (Meisn.) Taub.ex.Mez	tapinhoa,canela-tapinhoa	0,76								1				1		1						**3**
Leguminosae-Caesalpinoideae	Tachigali	multijuga Benth	ingá-brava,ingacu	0,52												1				1			1	**3**
Leguminosae-Mimosoideae	Enterolobium	gummiferum(Mart.) J.F.Macbr.	angico-de-minas,timburi-do-cerrado,orelha-de-negro,vinhatico-do-campo	0,61												1		1					1	**3**
Leguminosae-Papilionoideae	Lonchocarpus	subglaucescenes Mart. Ex Benth	embira-de-sapo,timbo				1									1							1	**3**
Leguminosae-Papilionoideae	Vataireopsis	araroba (Aguiar) Ducke	arroba,amargoso,moina,angelim-araroba,angelim-pedra	0,68												1		1					1	**3**
Leguminosae-Papilionoideae	Zollernia	glabra (Spreng.) Yakovl	mocitaiba,mucitaiba													1	1						1	**3**

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Malpighiaceae	Byrsonima	sericea DC.	murici,murici-penima,murici-miudo,murici-da-fruta-miuda	0,78								1				1	1							**3**
Myrtaceae	Plinia	rivularis	jaboticbarana,guaramirin,guamirin	0,95	1							1										1		**3**
Nyctaginacea	Pisonia	ambigua Heimert	maria-mole,maria-faceira													1	1					1		**3**
Nyctaginacea	Ramisia	brasilliensis Oliver	ganansaia,ganassaia,roda-saia	0,62								1				1	1							**3**
Rutaceae	Galipea	jasminiflora (A.ST.-Hill.)	guamixinga,tres-folhas-do-matoticoro,quina-quina				1									1	1							**3**
Sapindaceae	Cupania	oblongifolia Mart.	pau-magro,caboata	0,67							1	1				1								**3**
Sterculiaceae	Guazuma	crinita Mart.	mutamba,moco-bramco,algodao-do-mato	0,8									1			1						1		**3**
Bignoniaceae	Tabebuia	alba (Cham.) Sanwith	Ipe-da-serra,ipe amarelo -da-serra, ipe-,mandioca-ipe-tabaco,ipe mamona				1									1								**2**
Bignoniaceae	Tabebuia	cassinoides (Lam) DC:	caixeta, caxeta, tabebuia, pau axeta,pau paraiba, tabebuia do brejo(RJ), pau de tamanco, tamanqueira, malacaxeta,pau de viola, corticeira, pau paraiba, tamancao											1			1							**2**
Melastomaceae	Tibouchina	granulosa(Desr) Cogn.	quaresmeira.flor-de-quaresma,queresmeira-roxa,quaresma						1							1								**2**
Rutaceae	Metrodorea	stipularis	chupa-ferro,caputuna	1,05	1												1							**2**
Rutaceae	Zanthoxylum	rugosum	mamiqueira-fedorenta,mamiqueira													1						1		**2**
Sapotaceae	Chrysophyllum	gonocarpum (Mart. &Eichler) Engl.	aguai-da-serra, peroba-bramca,caxeta,coerana, mata-olho	0,7													1					1		**2**
Sterculiaceae	Sterculia	chicha A.St.Hil. Ex Turpin	chichá.xixá,boia,pau-de-boia,pau-de-cortica	0,39												1						1		**2**
Vochysiaceae	Qualea	jundiahy	jundial,terra-da-mata,louro-tinga,pau-terra												1							1		**2**
Vochysiaceae	Vochysia	tucanorum Mart.	cinzeiro, fruta-de-tucano-caixeta,cinzeira,rabo-de-tucano,rabo-de-arara,canela-samta											1							1			**2**
Apocynaceae	Geissospermum	laevis Miers	pereirinha, pau-pereira,quinarana,ubá-acu, pereiro, camara-do-mato,tringuaba,pau-pente,canudo-amargoso	0,76		1										1								**2**
Aquifoliaceae	Illex	theezans Mart.	ongonha,cauna-amargosa,orelha-de-mico,carvalho-branco,miqueira												1	1								**2**
Lauraceae	Endicheria	paniculata (Spreng.) J.F. Macbr	canela-frade,canela-jacua,canela-burra,canela,peluda,canela-guajaba,	0,58								1					1							**2**

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Leguminosae-Papilionoideae	Centrolobium	microchaete (Mart.ex Benth)	petimujú,putumucú araribá,gororoba,lei-nova	0,85	1																		1	**2**
Rubiaceae	Alibertia	sessillis K.Schum	marmelinho-do-campo,marmelada,bola	0,64												1						1		**2**
Rubiaceae	Posoqueria	acutifolia Mart.	baga-de-macaco,bacupari-miudo	0,7								2												**2**
Rutaceae	Esenbequia	febrifuga (A.St.-Hil.)	crumarinmamoninha-do-mato,mendanha,tres-folhas,quina-do-mato						1							1								**2**
Rutaceae	Hortia	arborea Engl.	paratudo.pratudo,casca-d`'anta	1,02	1																	1		**2**
Sapotaceae	Pouteria	grandiflora (DC) Baehni	bapeba-da-restinga,bapeba,oiti-toroba	0,82												1	1							**2**
Theaceae	Ternstroemia	brasiliensis Cambess.	bengue	0,47								1				1								**2**
Bignoniaceae	Jacaranda	puberula Cham.	arobinha, jacaranda-branco, caroba-da-mata-pau-de-colher													1								**1**
Leguminosae-Caesalpinoideae	Caesalpinia	echinata Lam.	pau-brasil,ibirapitanga,orabutá,brasileto,ibirapiranga,ibirapita, muirapiranga, pau-rosado, pau-de-pernambuco													1								**1**
Bombacaceae	Ceiba	erianthos (Cav.) K. Schum.	rocky silk-cotton, paineira-das-pedras	0,2												1								**1**
Combretaceae	Terminalia	kuhlmannil	araca-de-agua,araca.pelada	0,79													1							**1**
Rubiaceae	Bathysa	meridionalis L.B. Sm. & Downs	cauassu,macuqueiro,fumo-do-diablo,quina-do-mato	0,64															1					**1**
Vochysiaceae	Vochysia	bifalcata	guarinica-pau-de-vinho,vinheiro	0,5													1							**1**
Nyctaginacea	Bougainvillea	glabra Choisy	tres-marias, primavera-arvorea,ceboleiro-de-mata,riso-do-prado,juvu																					**0**

(1)it was assigned 1 point for Woods with density superior tan 0,85g/cm3

(2) 2 points correspond with trees with high Wood density