

List of Angiosperm species of the riparian vegetation of the Apodi-Mossoró river, Rio Grande do Norte, Brazil

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ABSTRACT: This article describes the riparian vegetation of a river in the Rio Grande do Norte state for the first time. This is a seasonal river in the semiárid region of the Caatinga biome. The study is based on data from herbarium collections and new expeditions from July 2007 to October 2008. Two hundred and forty seven taxa were recorded and of these, 116 are herbs and three of which are epiphytes, 25 sub-shrubs, 77 shrubs or trees, 26 lianas, one parasite, and two palms. This list of species of riparian vegetation in the river Apodi-Mossoró was compared with only two available lists from rivers in the northeast with similar environmental characteristics and showed a low similarity. This study points to the need for preservation of the species and remnants of riparian vegetation of the river Apodi-Mossoró and to increase efforts in the study of this vegetation type.

INTRODUCTION

The Apodi – Mossoró river basin, with an area of 14,268 km² (corresponding to 26.8% of the estimated area of the Rio Grande do Norte State), occurs in the Caatinga biome where the climate is very hot and semi-arid (SEMARH 1998), BSw'h' according to Köppen classification, being surrounded by the Araripe mountains and Borborema plateau (Rocha *et al.* 2009). The source and mouth of the river Apodi Mossoró are in the Rio Grande do Norte and it has 618 dams (Henry-Silva 2010), with a total water volume of 469.714.600m³ (SEMARH 2012).

The course of the river was the main route of Portuguese penetration into the interior of Rio Grande do Norte in the eighteenth century and its margins were already used for the establishment of corrals and gardens (Monteiro 2002). Currently, the major activities that interfere directly in the river are irrigated fruit growing, family agriculture, salt production, mineral exploration and oil production, which environmental and economic impacts focus entirely on the river basin (Rocha *et al.* 2009). Logging of riparian vegetation is also intense and is documented below.

With early deforestation and salinization of large areas downstream, little is left of the original riparian flora of the temporary rivers in the semi-arid Northeast and is curious to note that the descriptions of these vegetation types are contradictory. For Ab'Sáber (1999a, b; 2001) these "matinhas beiradeiras" of the northeastern rivers may be called "forests of craiba" (*Tabebuia aurea* (Silva Manso) Benth. and Hook. f. ex Moore). Andrade-Lima (1981) on the other hand characterizes them a palm forest, where the dominant taxa are *Copernicia prunifera* (Mill.) H.E. Moore, *Licania rigida* Benth. and *Geoffroea spinosa* Jacq., and he does not mention craiba. The descriptions of Ab'Sáber and Andrade Lima refer only to dominant taxa, and the riparian northeastern forests have been misinterpreted in that they contain a small number of species.

Complete lists of species of the riparian forests of Rio Grande do Norte were not found. The work of Tavares *et al.* (1975), although referring to the vegetation of the Piranhas-Açu basin, did not focus on the riparian vegetation. For other northeastern states knowledge of riparian vegetation is also rare. Noteworthy are the work of Nascimento *et al.* (2003), along the São Francisco river, and Lacerda *et al.* (2005), expanded by Lacerda and Barbosa (2006) for Taperoá river basin in Paraíba. In Pernambuco, there are studies on riparian vegetation of the river Pajeú (Souza and Rodal 2010), and an ethnobotanical study on the riparian vegetation of the river Navio, both in the Floresta municipality (Ferraz *et al.* 2006).

This study was conducted primarily to list the richness of Angiosperm taxa of the riparian vegetation of the Apodi-Mossoró river and discuss general aspects of this vegetation type, providing subsidies for its restoration and management.

MATERIALS AND METHODS

Figure 1 shows the river Apodi-Mossoró, which source is in the Serra dos Minhuns, Tigre de Cima district, in the municipality of Luís Gomes (06°22'08.8" S, 38°28'54.6" W) in the western region of Rio Grande do Norte, passing through the municipalities of Luís Gomes, Pau dos Ferros, Rafael Fernandes, Riacho de Santana, Apodi, Felipe Guerra, Governor Dix-Sept Rosado, Mossoró and empties between Areia Branca and Grossos (04°56' S, 37°09' W) into the Atlantic ocean.

The vegetation of the mountainous municipality of Luís Gomes consists mainly of semi-deciduous forest and, in this region, the climate is Aw' according to the Köppen classification, characterized by a tropical rainy climate with dry summer (SEMARH 1998). Even with the anthropic pressure of small farmers, this is the area along which the river is better preserved.

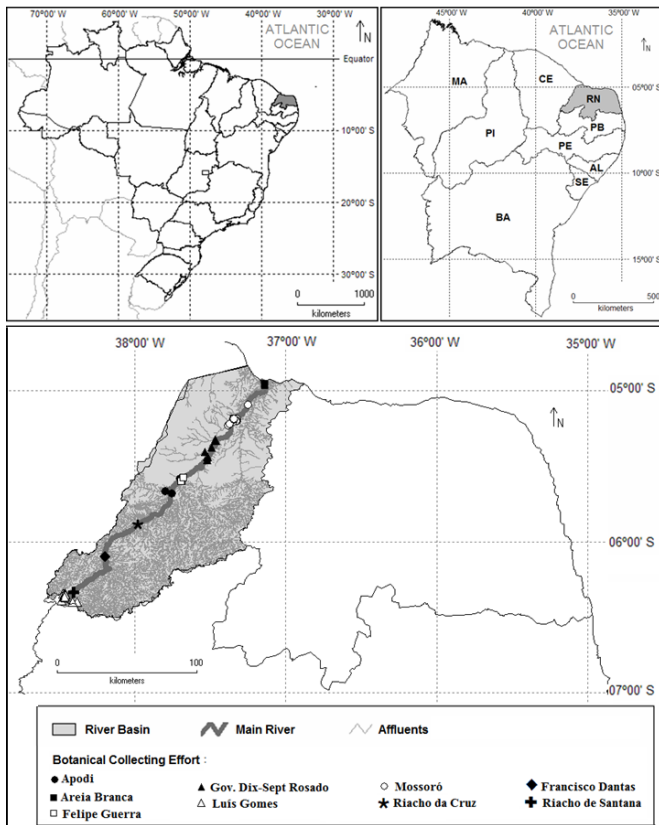


FIGURE 1. Localization map of Apodi-Mossoró river and municipality collection points.

The southern half of the basin consists of a Depression, a relief with predominantly flat plateau and Planaltos Residuais, which surfaces are delimited by erosional scarps with flat tops and sedimentary origin. The north-central portion of the basin is characterized by karst surface and in the far north, there is the coastal strip, according to data from SEMARH (1998) which presents more detail.

The floristic survey was based on the analysis of specimens deposited in the MOSS herbarium (acronym available in Thiers 2012) and new collections undertaken. Samples were collected monthly and some every two weeks, during the period from July 2007 to October 2008 (see Figure 1): 1) in the region of springs, in the municipality of Luís Gomes, 2) in preserved fragments in the municipality of Felipe Guerra, representing the middle portion of the river, and 3) in Mossoró, with estuarine characteristics. Additional collections were made in Governor Dix-Sept Rosado, Apodi, Riacho de Santana and Areia Branca.

The herbarium analysis showed species that were not found in the systematic field collection points. These species were then relocated based on the label information and with the aid of local informants.

The collections were made randomly within the area or directed by local informants. We sampled only fertile material, however a few tree species were only found

sterile and their names were included in the list presented in Table 1. We included species occurring in small grassland patches and aquatic herbs, associated with riparian forests.

Identifications were made using literature, by comparison in the herbaria and sending material to specialists. The vouchers were incorporated into the MOSS herbarium and duplicates distributed to EAC, UFRN and others. Popular names were provided by local informants. Information provided by the riverside communities was the main source for determining the location of endangered species. The scientific names are in accordance to the list of species in the flora of Brazil (Forzza et al. 2012).

We compared the similarity of the tree and shrub flora of the river Apodi-Mossoró with lists published in Lacerda et al. (2005) and Souza and Rodal (2010), due to their geographic proximity and similarities in environmental factors. Table 1 presents the environmental characteristics of the regions occupied by the rivers whose floristic lists were used in this comparison. The unidentified taxa were considered exclusive or distinct. Sub-shrubs from Apodi Mossoró river vegetation were included in the comparison if those species were considered shrubs or trees in the other two published lists. The similarity between the flora of these areas was based on Sørensen index (Mueller-Dombois and Ellenberg 1974).

RESULTS AND DISCUSSION

A total of 247 taxa were recorded in the Apodi-Mossoró riparian vegetation (Table 2), which represents the largest number of species records occurring along rivers in the Northeast. Of the species found, 116 are terrestrial or aquatic herbs and three epiphytes, 25 sub-shrubs, 77 shrubs or trees, 26 lianas, one parasite and two palm trees.

Non arboreal taxa: 119 species were found from this stratum (Table 1), represented in 28 families and 74 genera. Some taxa are illustrated in Figure 2. The Poaceae and Cyperaceae account for 41% of the herbaceous flora found in the riparian vegetation of this river. This large number of herbs is also due to sampling species from temporary ponds and associated pioneer taxa.

The families with the largest number of species were Poaceae (33 species), Cyperaceae (25 species), Asteraceae (14 species), Fabaceae (nine species) and Verbenaceae (five species).

The most diverse genera were *Cyperus* L. with 14 species, followed by *Eragrostis* Wolf, *Paspalum* L. and *Ludwigia* L. with four species each. *Tillandsia* Wilbr., *Eleocharis* R. Br, *Panicum* L., *Spermacoce* L. and *Lippia* L. had three species each and all other genera were represented by one or two species.

The species *Tarenaya spinosa* (Jacq.) Raf., *Cyperus compressus* L., *Croton heliotropifolius* Kunth., *Chloris barbata* Sw., *Apalanthe granatensis* (Bonpl.) Planch., *Echinochloa colona* (L.) Link, *Heteranthera seubertiana*

TABLE 1. Characteristics of the river basins used in the similarity studies.

RIVER	LATITUDE	LONGITUDE	CLIMATE	GEOLOGY	HIDROLOGY
Apodi-Mossoró	06°22'0.8" and 04°56'	38°28'54.6" and 37°09'	BSwh'	Cristalino	Seasonal
Pajeú	07°16'20" and 08°56'01"	36°59'00" and 38°57'45"	BSwh'	Cristalino	Seasonal
Taperoá	06°51'31" and 07°34'21"	36°0'55" and 37°13'9"	BSwh'	Cristalino	Seasonal

Solms and *Eleocharis geniculata* (L.) Roem. and Schult. were recorded in all the collecting areas.

Araújo *et al.* (2005) compared the herbaceous diversity in flat, rocky and riparian microhabitats in the Caatinga biome. The richness, diversity and uniqueness of the herbaceous species in riparian habitat were higher than the others. The similarity between the occurrence of non-arboreal taxa from this study compared to the list of Araújo *et al.* (2005) is extremely low. The species that occurred in both lists are *Bomarea edulis* (Tussac.) Herb. (under *B. salsilloides* (Mart.) Benth. and Hook), *Dalechampia* cf. *scandens* L., *Heliotropium angiospermum* Murray, *Herissantia crispa* (L.) Briziky, *Panicum trichoides* Sw., *Panicum venezuelae* Hack, *Ruellia asperula* (Mart. and Nees) Lindau and *Tragia volubilis* L. *Dactyloctenium aegyptium* (L.) P. Beauv. and *Enteropogon mollis* (Nees) Clayton appear in the list of Araújo *et al.* (2005), but are not related to the riparian habitat. The low similarity of the herbaceous layer between the Apodi-Mossoró and Olaria stream may be related to the heterogeneity of the riparian vegetation of the northeastern rivers (discussed below in greater detail), but also due to differences between the phytogeographic subzones occupied by rivers.

The three phytogeographic subzones of the Northeast are called “Zona da Mata”, “Agreste” and “Sertão”. According to Barbosa *et al.* (2006), the Zona da Mata extends from the coast in a strip of approximately 100km wide and has

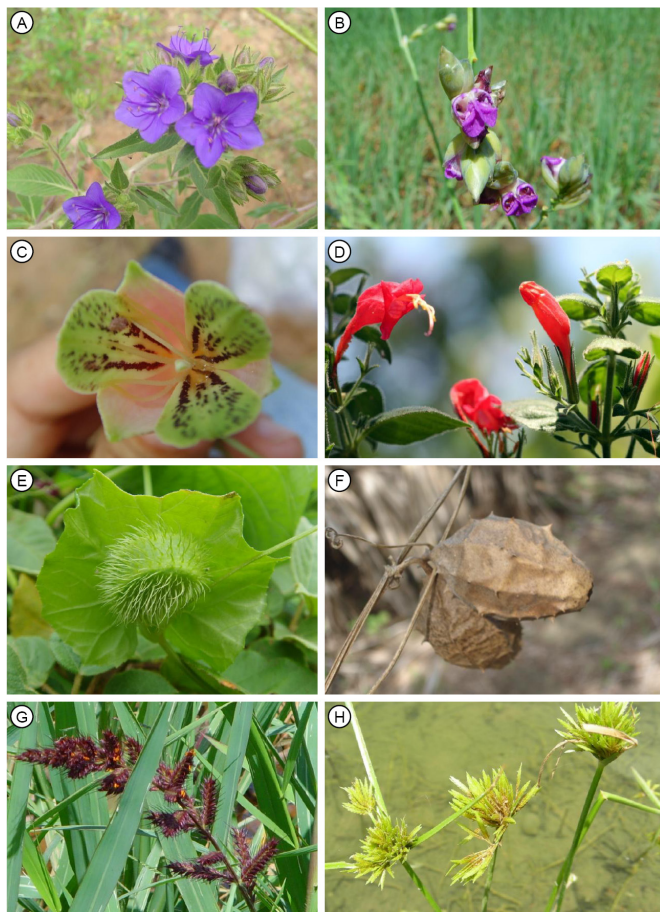


FIGURE 2. Some herbaceous species of Apodi-Mossoró River, Rio Grande do Norte, Brazil. HYDROLEACEAE: A. *Hydrolea spinosa* L.; MARANTACEAE: B. *Thalia geniculata* L.; ALSTROEMERIACEAE: C. *Bomarea edulis* (Tussac.) Herb.; ACANTHACEAE: C. *Ruellia asperula* (Mart. and Nees) Lindau; CUCURBITACEAE: E. *Luffa operculata* (L.) Cogn.; F. *Rytidostylis amazonica* (Mart. ex Cogn.) Kuntze; POACEAE: F. *Echinochloa polystachya* (Kunth) Hitchc.; CYPERACEAE: G. *Pycurus polystachyos* (Rottb.) P. Beauv.

humid tropical climate, fertile soil and occupied by atlantic rainforest. The Agreste is a transition area between the more humid Zona da Mata and the semi arid Sertão. Araújo *et al.* (2005) worked in an area of the Olaria stream located in the Agreste, called dry tropical forest by the authors. Works that deal with the distribution pattern of taxa in Pernambuco show that species richness varies between the subzones, with exclusive taxa occurring in each subzone. The Agreste has higher richness of taxa and exclusive species, when compared with the Sertão. Among others, the work of Barros *et al.* (1988) and Abreu *et al.* (2008) illustrate this distribution pattern by analysis of distant taxonomic groups, such as Pteridophytes and *Oxalis* L. (Oxalidaceae) respectively, with the higher number of taxa in the Agreste than in the Sertão and emphasize the occurrence of exclusive species, characteristic of each subzone. Maciel *et al.* (2010) showed that Agreste is populated with all the species of *Paspalum* L. (Poaceae) occurring in Pernambuco and that this subzone is the richest in exclusive species when compared with the Sertão, which, in turn, also has exclusive species. The Apodi-Mossoró river is restricted to the Sertão and Olaria stream to the Agreste.

The time of year can also be the cause of low similarity, since Araújo *et al.* (2005) sampled only those species that occurred in the rainy season, with no data collected during the dry season. *Eragrostis hypnoides* (Lam.) Britton, for example, was only found in the dry season, occurring in the shrinking lake margins, which was also observed by Ferreira *et al.* (2009). Reis *et al.* (2006) and Lima *et al.* (2007) showed that due to variations in total rainfall between years, characteristic of northeastern climate, the herbaceous community structure can be changed and many populations can show drastic reductions in size, even disappearing completely from the area. Lima *et al.* (2007) evaluating the phenological differences between microhabitats in an area of caatinga, concluded that spatial variations in the microhabitats conditions associated with interannual variations in total rainfall may change the flowering period and recruitment of herbaceous plants. They also showed that a short time series may not be sufficient to describe the plasticity that exists within populations and infer the geographical distribution of some herbaceous species of the caatinga.

We sampled 30 species of lianas belonging to 25 genera, 14 families with one undetermined species. The families Fabaceae (seven species), Cucurbitaceae (five species) and Sapindaceae (four species) showed the highest species richness, accounting for 50% of the liana species found. Moreover, ten families (37%) were represented by a single liana species. The genera of higher species richness were *Luffa* Mill., *Cardiospermum* L. and *Paullinia* L., with two species each, and the remaining 20 genera (74%) had only one. Remarkably, 18 (66%) of the 27 species found occurred only in the Luís Gomes region, where the river sources were found. As previously mentioned, the source of the Apodi-Mossoró river is located in the Serra dos Minhuns, which has semi-deciduous vegetation. The occurrence of a significant number of lianas in a semi-deciduous vegetation was reported for the Rio Grande do Norte State (Oliveira *et al.* 2012), but there are several reports for the São Paulo State (Udulutsch *et al.* 2004;

Ranga and Rao 2005; Tibiriçá et al. 2006). Udulutsch et al. (2004) highlighted this high liana species richness as attributes of these seasonally semi-deciduous forest fragments. No published data on the occurrence of lianas in riparian forests of the Northeast temporary rivers was found.

Tree-shrub taxa: The family with the highest number of taxa was Fabaceae, with 19 genera and 30 species, followed by Euphorbiaceae, with four genera and five species. Figure 3 shows the illustration of tree-shrub taxa. Fabaceae and Euphorbiaceae also were cited as the richest families in species numbers in other surveys of the tree-shrub layer in areas of caatinga (Lemos et al. 2004; Amorim et al. 2005; Gomes et al. 2006; Santana and Souto 2006) and the seasonally semi-deciduous forests (Rodal et al. 2005).

Table 3 compares the number of tree taxa from the rivers Taperoá in Paraíba (Lacerda et al. 2005) and Pajeú in Pernambuco (Souza and Rodal 2010) with the results from this work. The total list of tree species considered in the three surveys shows that of the 103 species compiled, only nine were cited for riparian vegetation in all the rivers: *Aspidosperma pyriforme* Mart., *Cnidocolus quercifolius* Pohl, *Erythrina velutina* Willd. (Figure 3A), *Jatropha mollissima* (Pohl.) Baill., *Libidibia ferrea* (Mart. ex Tul.) L.P. Queiroz, *Lonchocarpus sericeus* (Poir.) Kunth

ex DC., *Vitex gardneriana* Schauer, *Sideroxylon obtusifolium* (Humb. ex Roem. and Schult.) T.D. Penn and *Ziziphus joazeiro* Mart..

This same table shows that the number of unique tree taxa, or those quoted in only one of the three surveys is high. There are 18 species cited for Taperoá which did not occur in the other two areas, six were unique to the river Pajeú and 40 to the Apodi Mossoró river. The Sørensen index shows a low similarity between the tree-shrub flora of the river areas and Taperoá river shares more species in common with the Apodi Mossoró river (Table 3).

The large number of exclusive species in the riparian vegetation of the Apodi-Mossoró is probably due to sampling along the entire length of the river, which did not occur in the other two surveys. Thus, species occurring in the mangrove penetrated into the riparian vegetation, as is the case *Laguncularia racemosa* (L.) C.F. Gaertn., *Avicennia* spp. and *Lycium martii* Sendtn. collected in Mossoró, site with a strong estuarine influence. The same occurs in the region of springs in Luiz Gomes, which was surrounded by semi deciduous forest species, as is the case *Myrciaria tenella* (DC.) O.Berg (Pereira et al. 2002) and *Thiloo glaucocarpa* (Mart.) Eichler, *Copaifera* sp. among others. Figure 4 illustrates the various environments found in this work.

The description given by Ab'Sáber (2001) of a riparian vegetation of seasonal rivers in the Northeast, being dominated by "craiba" (*Tabebuia aurea*), could not be applied in any of the remaining sections of the river Apodi-Mossoró at least not today. No records of "craiba" were found along the Apodi-Mossoró river.

The rarity of "craiba" may be due to human influence. There are indications of a more frequent occurrence of this species, such as the name of a municipality in the watershed Apodi-Mossoró as Caraúbas, which is an obvious reference to "craiba" which is also called "caraúba" (Braga 1976). Another interesting fact that can aid the discussion, is that "craiba" showed higher use value in the study by Ferraz et al. (2006) in a creek in Pernambuco. However, according to these authors, the current use by the local population is not consistently associated with positive or negative impacts on the conservation of the species.

In Andrade-Lima (1982) characterization there is no reference to "craibeira" and the riparian vegetation of the Rio Grande do Norte, Ceará and Piauí seasonal rivers is a "forest of palms" with predominantly *Copernicia prunifera*, *Licania rigida* (Figure 3F) and *Geoffroea spinosa*. Interestingly, none of the dominant species considered by Ab'Sáber (2001) or Andrade Lima (1982) were found in the list of species shared between the three areas.

The lack of "craiba" in the riparian vegetation of Apodi Mossoró today could be explained by human action, but the lack of "carnauba" in the Taperoá river (Lacerda et al. 2005; Lacerda and Barbosa 2006) is more complicated and seems to demonstrate that the riparian vegetation of the Northeast rivers is extremely heterogeneous and that the descriptions of Andrade-Lima and Ab'Sáber are not conflicting, but refer to different distinct contexts. The description given by Andrade-Lima (1981) demonstrates better the vegetation more frequently found in the small remnants along the Apodi-Mossoró river: great proliferation of "carnaúba" and "oiticicas" of considerable

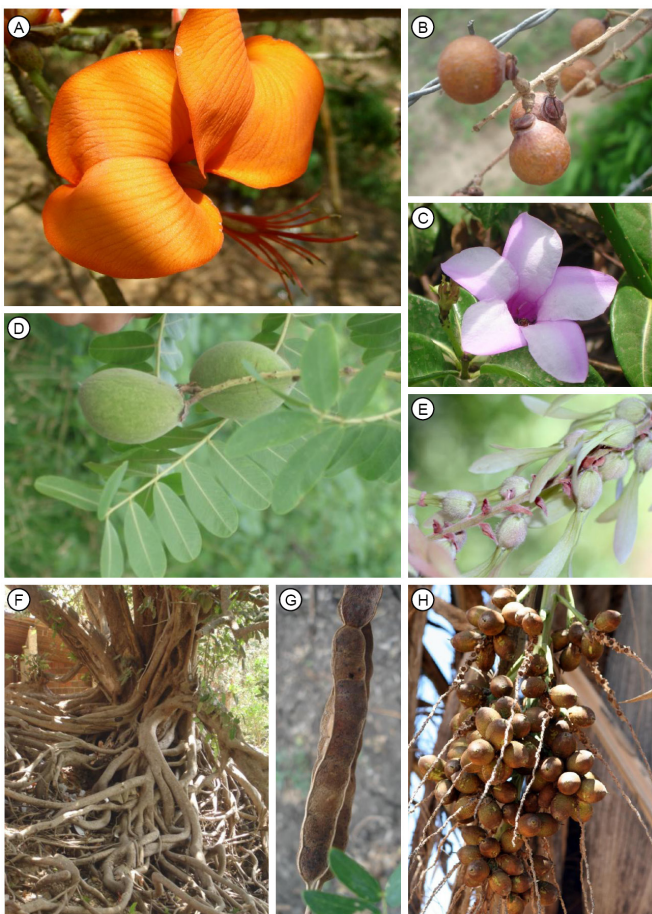


FIGURE 3. Some tree and shrub species of Apodi-Mossoró River, Rio Grande do Norte, Brazil. FABACEAE: A. *Erythrina velutina* Willd. SAPINDACEAE: B. *Sapindus saponaria* L. Fruits; APOCYNACEAE: C. *Cryptostegia grandiflora* R. Br., Invasive species; CAPPARACEAE: D. *Crataeva tapia* L.; POLYGONACEAE: E. *Triplaris gardneriana* Wedd. Fruits; CHRYSOBALANACEAE: F. *Licania rigida* Benth. Roots; FABACEAE: G. *Albizia inundata* (Mart.) Barneby and J.W. Grimes; ARECACEAE: H. *Syagrus cearensis* Noblick.

size and the frequent presence of “marizeiro” or “umarizeiro”.

Ab’Sáber (1999b) refers to “ariscos” which are grassy fields with groups of “carneúbas”. Formations that approach this description can be found in the Mossoró municipality, except for the presence of “craibeira”, as mentioned in the previous paragraph. In these formations, *Cyperus articulatus* L. (Cyperaceae), locally known as “junco”, covers the areas flooded and *Paspalum vaginatum* Sw. (Poaceae), surround the “junco ponds” in the drier portions of these wetlands. At the edges of these areas, the “joazeiro” (*Zizyphus joazeiro*) is very frequent.

In addition to differences in the composition of riparian vegetation between the rivers of the Northeast, there is a floristic heterogeneity of riparian forests conditioned by ecotonal nature of the border, which is occupied by more than one type of vegetation or distinct physiognomic formations, as emphasized by Rodrigues and Nave (2001). The fragments of the riparian vegetation studied along the Apodi-Mossoró river were shown to be heterogeneous in physiognomic and floristic terms.



FIGURE 4. A. Riparian vegetation of a secondary river to Mossoró river, called Riacho do Rela, in Luiz Gomes, Rio Grande do Norte, Brazil; B. Seasonal lake, surrounded by riparian vegetation, with an abundance of *Albizia inundata* (Mart.) Barneby and J.W. Gremes and *Copernicia prunifera* (Mill.) H.E. Moore; C and D. Riparian vegetation of the main Mossoró spring source, Luiz Gomes municipality, C. dry season; D. rainy season; E. Perennial spring source in Luiz Gomes; F. Temporary lake in the rainy season, surrounded by *Paspalum vaginatum* Sw.; G and H. Apodi-Mossoró river in the municipality of Felipe Guerra, showing the intense logging.

According to Fernandes (2005), the influence of mountain forests in the composition of the riparian vegetation of the rivers of northeast is broad, since species have originated from the adjacent mountains. Similar proposition was made and substantiated by Oliveira Filho and Ratter (2001) to explain the extraordinary richness of the riparian vegetation of the Cerrado, and they suggest that elements of riparian vegetation were “imported” from neighboring forest formations.

In the municipality of Felipe Guerra, there are limestone outcrops along the river margins, covered by an open caatinga, where the herbaceous layer is conspicuous, with frequent occurrence of “pereiro” (*Aspidosperma pyriforme*), “macambira” (*Bromelia laciniosa* Mart. ex Schult. f.) and “cactus” (*Cereus jamacaru* DC.). *Pithecoseris pacourinoides* Mart. ex. DC is a conspicuous element, found exclusively in these formations.

Besides eliminating the riparian vegetation as a whole, selective pressure on certain species is also likely to occur. Species considered typical and frequent (Andrade-Lima 1981), as *Geoffrea spinosa*, the popular “umarizeiro”, have reduced populations today, even though the cooked fruit is well appreciated by riverine communities. *Sapindus saponaria* L. is also represented by a few individuals, located in Apodi.

Only two individuals of *Vitex gardneriana* Schauer, popularly called “jarimataia” and *Trichilia hirta* L., “barandão”, were relocated and could be prioritized in recuperation programs to maintain these taxa in riparian vegetation of the Apodi-Mossoró river or at least in Apodi. The distribution of these species seems never to have been continuous along the length of the river, since the previous collection records are concentrated only in Apodi and communities of the source regions apparently did not know these species. According to reports from the riverside community of Apodi, stems from “jarimataia” and “barandão” are extracted to manufacture tool handles and fence posts.

Besides the removal of the riparian vegetation of the Apodi-Mossoró river, biological invasion by exotic species is common. The “algarroba” (*Prosopis juliflora* (Sw.) DC.) mixed with the native pioneer “jurema preta” (*Mimosa tenuiflora* (Willd.) Poir.), forms large tracts of vegetation along the river, especially in Mossoró. Another concern is the invasion by “unha-de-cão” (*Cryptostegia grandiflora* R.Br., Figure 3C), a species endemic to Madagascar and naturalized in tropical regions of the world (Vieira et al. 2004), which forms dense, impenetrable forests in floodplains. To a lesser extent, we observed the invasion of riparian vegetation by *Parkinsonia aculeata* L., whose impact in areas of the Northeast has been documented (Fabricante 2009).

The results of this study point to a small similarity between areas of riparian vegetation, as reported for other regions (Rodrigues and Nave 2001), but the small number of available studies do not provide a comprehensive view of the distribution of species in the seasonal rivers of semi-arid region of Brazil.

TABLE 2. Species list of the riparian vegetation of Apodi-Mossoró river, RN, organized in alphabetical order by family, with common names, habit, and voucher. RCO = Regina Célia de Oliveira; ASS = Anádría Stéphanie da Silva, Ribeiro = André Rodolfo de Oliveira Ribeiro and Cunha = E.M. (colector name unavailable) Cunha.

SPECIES	COMMON NAME	HABIT	VOUCHER
Acanthaceae			
<i>Justicia aequilabris</i> (Nees) Lindau	-	Shrub	RCO 2213
<i>Justicia</i> sp.	-	Shrub	RCO 2140
<i>Ruellia asperula</i> (Mart. and Nees) Lindau	-	Sub-shrub	ASS 2
<i>Ruellia paniculata</i> L.	-	Sub-shrub	RCO 2239
Alismataceae			
<i>Echinodorus subalatus</i> (Mart.) Griseb.	-	Herb	RCO 2169
<i>Hydrocleys martii</i> Seub.	-	Herb	RCO2303 ^a
Alstroemeriaceae			
<i>Bomarea edulis</i> (Tussac) Herb.	-	Liana	RCO 2212
Amaranthaceae			
<i>Alternanthera brasiliiana</i> (L.) Kuntze	-	Herb	RCO 2167
<i>Alternanthera tenella</i> Colla	-	Herb	RCO 2111
sp.1	-	Herb	RCO 1957
Anacardiaceae			
<i>Myracrodruon urundeuva</i> Allemão	aroreira do sertão	Tree	No voucher
<i>Spondias mombin</i> L.	-	Tree	No voucher
Apocynaceae			
<i>Aspidosperma pyrifolium</i> Mart.	Pereiro	Tree	RCO 2132
<i>Cryptostegia grandiflora</i> R. Br.	unha-de-cão	Liana	Cunha 12
<i>Odontadenia punctulosa</i> (Rich.) Pulle	-	Liana	No voucher
<i>Oxypetalum</i> sp.	-	Liana	RCO 1939
Arecaceae			
<i>Copernicia prunifera</i> (Mill.) H.E. Moore	Carnaúba	Palm	No voucher
<i>Syagrus cearensis</i> Noblick	côco-católé	Palm	RCO 2247
Asteraceae			
<i>Acanthospermum hispidum</i> DC.	-	Sub-shrub	RCO 2192
<i>Acmella brachyglossa</i> Cass. (citada só para Bahia na lista do Brasil)	-	Herb	RCO 2168
<i>Ageratum conyzoides</i> L.	-	Sub-shrub	RCO 2172
<i>Bidens riparia</i> Kunth	-	Herb	RCO 2130
<i>Brickellia diffusa</i> (Vahl) A.Gray	cabelo-de-cão	Herb	RCO 2309
<i>Centratherum punctatum</i> Cass.	-	Sub-shrub	RCO 2241
<i>Melanthera nivea</i> (L.) Small	-	Sub-shrub	RCO 1941
<i>Mikania cordifolia</i> (L.f.) Willd.	cesto-de-velho	Liana	RCO 1949
<i>Pectis brevipedunculata</i> Sch.Bip.	Alecrim	Herb	RCO 2184
<i>Pithecoseris pacourinoides</i> Mart. ex. DC.	-	Herb	RCO 1924
<i>Porophyllum ruderales</i> (Jacq.) Cass.	cravo-de-urubu	Herb	RCO 2183
<i>Spilanthes</i> sp.	-	Herb	RCO 1953
<i>Wedelia</i> sp.	-	Herb	RCO 2123
sp.1	-	Sub-shrub	RCO 1938
sp.2	-	Sub-shrub	RCO 2316
Bixaceae			
<i>Cochlospermum vitifolium</i> (Willd.) Spreng.	Pacote	Tree	RCO 2307
Boraginaceae			
<i>Euploca procumbens</i> (Mill.) Diane and Hilger	-	Herb	ASS 51
<i>Euploca ternata</i> (Vahl) J.I.M.Melo and J.Semir	-	Herb	RCO 2122
<i>Heliotropium angiospermum</i> Murray	-	Sub-shrub	RCO 2127
<i>Heliotropium</i> sp.	-	Herb	RCO 1821
Bromeliaceae			
<i>Tillandsia recurvata</i> (L.) L.	-	Epiphyte	RCO 2200
<i>Tillandsia streptocarpa</i> Baker	-	Epiphyte	RCO 2201
<i>Tillandsia tricholepis</i> Baker	-	Epiphyte	RCO 2202
Burseraceae			
<i>Commiphora leptophloeos</i> (Mart.) J.B.Gillett	-	Tree	No voucher
Cactaceae			
<i>Cereus jamacaru</i> DC.	-	Tree	No voucher
Capparaceae			
<i>Crataeva tapia</i> L.	Trapiá	Tree	ASS 43

TABLE 2. CONTINUED.

SPECIES	COMMON NAME	HABIT	VOUCHER
<i>Cynophalla flexuosa</i> (L.) J.Presl.	feijão-bravo	Tree	ASS 48
Cleomaceae			
<i>Tarenaya spinosa</i> (Jacq.) Raf.	Mussambê	Herb	ASS 31
Combretaceae			
<i>Combretum leprosum</i> Mart.	Mofumbo	Tree / Shrub	RCO 2137
<i>Combretum lanceolatum</i> Pohl ex Eichler	mofumbo-do-rio	Shrub	RCO 2329
<i>Laguncularia racemosa</i> (L.) C.F.Gaertn.	Mangue	Tree	Ribeiro 86
<i>Thiloa glaucocarpa</i> (Mart.) Eichler	-	Shrub	No voucher
Commelinaceae			
<i>Tradescantia zanonii</i> (L.) Sw.	-	Herb	RCO 2211
Convolvulaceae			
sp.1	-	Liana	RCO 2189
Chrysobalanaceae			
<i>Licania rigida</i> Benth.	Oiticica	Tree	RCO 2242
Curcubitaceae			
<i>Luffa cylindrica</i> M.Roem.	Bucheira	Liana	ASS 23
<i>Luffa operculata</i> (L.) Cogn.	-	Liana	ASS 45
<i>Momordica charantia</i> L.	melão-são-caetano	Liana	ASS 27
<i>Rytidostylis amazonica</i> (Mart. ex Cogn.) Kuntze	-	Liana	RCO 2190
sp.1	Jitirana	Liana	RCO 2191
Cyperaceae			
<i>Cyperus aggregatus</i> (Willd.) Endl.	-	Herb	RCO 2223
<i>Cyperus articulatus</i> L.	-	Herb	ASS 3
<i>Cyperus compressus</i> L.	-	Herb	RCO 2110
<i>Cyperus cuspidatus</i> Kunth	-	Herb	Ribeiro, 199
<i>Cyperus distans</i> L.f.	-	Herb	RCO 2222
<i>Cyperus enterianus</i> Boeck.	-	Herb	RCO 2224
<i>Cyperus esculentus</i> L.	-	Herb	Ribeiro 170
<i>Cyperus iria</i> L.	-	Herb	Ribeiro 172
<i>Cyperus laxus</i> Lam.	-	Herb	Ribeiro 4
<i>Cyperus ligularis</i> L.	capim-navalha	Herb	Ribeiro 19
<i>Cyperus odoratus</i> L.	-	Herb	RCO 2235
<i>Cyperus rotundus</i> L.	-	Herb	Ribeiro 95
<i>Cyperus squarrosus</i> L.	-	Herb	Ribeiro 181
<i>Cyperus surinamensis</i> Rottb.	-	Herb	RCO 2234
<i>Eleocharis geniculata</i> (L.) Roem. and Schult.	-	Herb	Ribeiro 6
<i>Eleocharis minima</i> Kunth	-	Herb	RCO 2253
<i>Eleocharis mutata</i> (L.) Roem. and Schult.	-	Herb	Ribeiro 5
<i>Fimbristylis cymosa</i> R. Br.	-	Herb	Ribeiro 7
<i>Fimbristylis dichotoma</i> (L.) Vahl	-	Herb	Ribeiro 154
<i>Lipocarpha micrantha</i> (Vahl) G.C.Tucker	-	Herb	Ribeiro 184
<i>Pycnus fugax</i> (Liebm.) C. D. Adams	-	Herb	Ribeiro 167
<i>Pycnus macrostachyos</i> (Lam.) J.Raynal	-	Herb	Ribeiro 171
<i>Pycnus polystachyos</i> (Rottb.) P.Beauv.	-	Herb	Ribeiro 112
<i>Rhynchospora contracta</i> (Nees) J.Raynal	barba-de-bode	Herb	Ribeiro 2
<i>Scleria reticularis</i> Michx.	-	Herb	Ribeiro 180
Euphorbiaceae			
<i>Cnidocolus quercifolius</i> Pohl	Faveira	Tree	RCO 2152
<i>Croton heliotropiifolius</i> Kunth.	Velame	Sub-shrub	ASS 36
<i>Croton sonderianus</i> Müll. Arg.	Marmeleiro	Tree	RCO 1968
<i>Croton</i> sp.	-	Herb	ASS 50
<i>Dalechampia</i> cf. <i>scandens</i> L.	-	Liana	RCO 2171
<i>Euphorbia</i> sp.	-	Herb	RCO 2151
<i>Jatropha gossypifolia</i> L.	pinhão-roxo	Sub-shrub	ASS 24
<i>Jatropha mollissima</i> (Pohl.) Baill.	Pinhão	Tree	ASS 35
<i>Manihot carthaginensis</i> subsp. <i>glaziovii</i> (Müll.Arg.) Allem	-	Tree	No voucher
<i>Tragia volubilis</i> L.	-	Liana	RCO 1933
sp.1	-	Shrub	RCO 2217
Eriocaulaceae			
sp.1	-	Herb	RCO 2251

TABLE 2. CONTINUED.

SPECIES	COMMON NAME	HABIT	VOUCHER
Erythroxylaceae			
<i>Erythroxylum</i> sp.		Tree	ASS 46
Fabaceae			
<i>Albizia inundata</i> (Mart.) Barneby and J.W.Gremes	-	Tree	ASS 55
<i>Amburana cearensis</i> (Allemão) A.C.Sm.	-	Tree	No voucher
<i>Anadenanthera colubrina</i> (Vell.) Brenan	Angico	Tree	RCO 2229
<i>Anadenanthera colubrina</i> var. <i>cebil</i> (Griseb.) Altschul	angico-branco	Tree	RCO 2305
<i>Anadenanthera</i> sp.	angico-preto	Tree	RCO 2336
<i>Arachis dardani</i> Krapov. and W.C.Greg.	mundubim-de-carcará	Herb	RCO 2188
<i>Bauhinia cheilantha</i> (Bong.) Steud.	capa-bode	Shrub	RCO 2193
<i>Bauhinia pulchella</i> Benth.	mororó-da-serra	Tree	AROR 11
<i>Bauhinia</i> sp.	Mororó	Shrub	RCO 2182
<i>Centrosema brasiliense</i> (L.) Benth.	xibiu-de-negra	Liana	AROR 194
<i>Chaetocalyx scandens</i> (L.) Urb.	-	Liana	RCO 2226
<i>Chamaecrista duckeana</i> (P. Bezerra and Afr. Fernandes) H.S. Irwin and Barneby	-	Sub-shrub	RCO 2165
<i>Chloroleucon dumosum</i> (Benth.) G. P. Lewis	Arapiraca	Tree	RCO 1963
<i>Copaifera</i> sp.	pau-d'óleo	Tree	ASS 16
<i>Cratylia argentea</i> (Desv.) Kuntze	-	Liana	RCO 1945
<i>Crotalaria retusa</i> L.	guizo-de-cascavel	Herb	ASS 26
<i>Dioclea grandiflora</i> Mart. ex Benth.	Mucunã	Liana	RCO 1944
<i>Erythrina velutina</i> Willd.	Mulungu	Tree	RCO 1967
<i>Geoffroea spinosa</i> Jacq.	Marizeiro	Tree	ASS 34
<i>Inga edulis</i> Mart.	-	Tree	RCO 232
<i>Libidibia ferrea</i> (= <i>Caesalpinia ferrea</i> Mart. ex Tul. var. <i>ferrea</i>)	Jucá	Tree	RCO 1940
<i>Lonchocarpus sericeus</i> (Poir.) Kunth ex DC.	Ingazeira	Tree	ASS 53
<i>Machaerium vestitum</i> Vogel	Violeta	Tree	ASS 19
<i>Macroptilium lathyroides</i> (L.) Urb.	-	Herb	RCO 2219
<i>Mimosa invisita</i> Mart. ex Colla	-	Liana	RCO 2227
<i>Mimosa modesta</i> Mart.	-	Sub-shrub	RCO 2206
<i>Mimosa paraibana</i> Barneby	-	Tree	RCO 2207
<i>Mimosa sensitiva</i> L.	-	Liana	RCO 2187
<i>Mimosa tenuiflora</i> (Willd.) Poir.	jurema-preta	Tree	RCO2303 ^b
<i>Parkinsonia aculeata</i> L.	-	Tree	ASS 22
<i>Piptadenia stipulacea</i> (Benth.) Ducke	jurema-branca	Tree	RCO 1948
<i>Piptadenia viridiflora</i> (Kunth) Benth	-	Tree	ASS 1
<i>Pithecellobium diversifolium</i> Benth.	Espinheiro	Tree	RCO 2349
<i>Pithecellobium dulce</i> (Roxb.) Benth.	Carolina	Tree	ASS 5
<i>Poincianella bracteosa</i> (Tul.) L.P. Queiroz	Catingueira	Tree	RCO 1964
<i>Poincianella pyramidalis</i> (Tul.) L.P. Queiroz	Catingueira	Tree	RCO 2139
<i>Prosopis juliflora</i> (Sw.) DC.	-	Tree	No voucher
<i>Rhynchosia minima</i> (L.) DC.	-	Liana	RCO 1814
<i>Sesbania exasperata</i> Kunth	-	Sub-shrub	ASS 30
<i>Senna martiana</i> (Benth.) H.S. Irwin and Barneby	flor-de-são-joão	Tree / Shrub	RCO 2138
<i>Senna spectabilis</i> (DC.) H.S. Irwin and Barneby	Canaffstula	Tree / Shrub	RCO 1947
<i>Senna rizzinii</i> H.S. Irwin and Barneby	-	Tree	RCO 1823
<i>Stylosanthes</i> sp.	-	Herb	RCO 2121
<i>Tephrosia purpurea</i> (L.) Pers.	-	Sub-shrub	RCO 2327
<i>Vachellia farnesiana</i> (L.) Wight and Arn.	Coronha	Shrub	RCO 1946
sp.1	-	Herb	ASS 39
Gentianaceae			
<i>Schultesia doniana</i> Progel		Sub-shrub	RCO 1954
Gesneriaceae			
<i>Sphaerorrhiza sarmentiana</i> (Gardner ex Hook.) Roalson and Boggan	-	Herb	RCO 2209
Hydrocharitaceae			
<i>Apalanthe granatensis</i> (Bonpl.) Planch.	-	Herb	RCO 2113
Hydroleaceae			
<i>Hydrolea spinosa</i> L.	-	Sub-shrub	RCO 1950
Lamiaceae			
<i>Marsypianthes</i> cf. <i>chamaedrys</i> (Vahl) Kuntze	-	Herb	RCO 2142
<i>Vitex gardneriana</i> Schauer	Jarimataia	Tree	RCO 2332

TABLE 2. CONTINUED.

SPECIES	COMMON NAME	HABIT	VOUCHER
sp.	-	Sub-shrub	RCO 2252
sp.	-	Herb	RCO 2112
Lythraceae			
<i>Cuphea campestris</i> Koehne	-	Herb	RCO 2136
Malpighiaceae			
<i>Heteropterys</i> sp.	-	Liana	RCO 1966
<i>Stigmaphyllon paralias</i> A. Juss.	buquê-de-noiva	Shrub	RCO 2173
Malvaceae			
<i>Guazuma ulmifolia</i> Lam.	-	Tree	ASS 54
<i>Herissantia crispa</i> (L.) Briziky	-	Sub-shrub	RCO 2144
<i>Herissantia tiubae</i> (K. Schum.) Brizicky	-	Herb	RCO 2311
<i>Sida ciliaris</i> L.	-	Sub-shrub	RCO 2175
<i>Sida</i> sp.	-	Herb	ASS 33
sp.1	-	Sub-shrub	RCO 1958
Maranthaceae			
<i>Thalia geniculata</i> L.	-	Herb	RCO 2160
Meliaceae			
<i>Trichilia hirta</i> L.	barandão	Tree	RCO 2324
Moraceae			
<i>Ficus guianensis</i> Desv. ex Ham.	gameleira	Tree	RCO 2218
Myrtaceae			
<i>Myrciaria tenella</i> (DC.) O.Berg	goiabinha	Tree	ASS 13
Nyctaginaceae			
<i>Boerhavia</i> sp.	pega-pinto	Herb	ASS 37
Nymphaeaceae			
<i>Nymphaea ampla</i> (Salisb.) DC.	-	Herb	RCO 2302
<i>Nymphaea gardneriana</i> Planch.	-	Herb	RCO 2232
Onagraceae			
<i>Ludwigia decurrens</i> Walter	-	Herb	RCO 1965
<i>Ludwigia grandiflora</i> (Michx.) Greuter and Burdet	-	Herb	ASS 25
<i>Ludwigia helminthorrhiza</i> (Mart.) H.Hara	-	Herb	ASS 11
<i>Ludwigia octovalvis</i> (Jacq.) P.H.Raven	-	Herb	ASS 7
Oxalidaceae			
<i>Oxalis glaucescens</i> Norlind	-	Herb	RCO 2128
Phytolaccaceae			
<i>Petiveria alliacea</i> L.	-	Herb	RCO 2228
Plantaginaceae			
<i>Angelonia</i> cf. <i>biflora</i> Benth.	-	Herb	RCO 2238
<i>Angelonia campestris</i> Nees and Mart.	-	Herb	RCO 1959
Plumbaginaceae			
<i>Plumbago</i> sp.	-	Sub-shrub	RCO 2143
Poaceae			
<i>Aristida adscensionis</i> L.	-	Herb	RCO 2147
<i>Aristida elliptica</i> (Nees) Kunth	-	Herb	RCO 1935
<i>Axonopus capillaris</i> (Lam.) Chase	-	Herb	RCO 2194
<i>Bouteloua americana</i> (L.) Scribn.	-	Herb	RCO 2105
<i>Cenchrus</i> cf. <i>pedicellatus</i> (Trin.) Morrone	-	Herb	RCO 2163
<i>Cenchrus purpureus</i> (Schumach.) Morrone	-	Herb	RCO 2166
<i>Chloris barbata</i> Sw.	-	Herb	RCO 2161
<i>Dactyloctenium aegyptium</i> (L.) Willd.	-	Herb	RCO 2108
<i>Digitaria bicornis</i> (Lam.) Roem. and Schult.	-	Herb	RCO 2109
<i>Echinochloa colona</i> (L.) Link	-	Herb	RCO 2333
<i>Echinochloa polystachya</i> (Kunth) Hitchc.	-	Herb	RCO 2155
<i>Eleusine indica</i> (L.) Gaertn.	-	Herb	RCO 2162
<i>Enteropogon mollis</i> (Nees) Clayton	-	Herb	RCO 2148
<i>Eragrostis ciliaris</i> (L.) R.Br.	-	Herb	RCO 2197
<i>Eragrostis glomerata</i> (Walter) L.H.Dewey	-	Herb	RCO 2250
<i>Eragrostis hypnoides</i> (Lam.) Britton	-	Herb	RCO 2313
<i>Eragrostis pilosa</i> (L.) P.Beauv.	-	Herb	RCO 2106
<i>Eriochloa punctata</i> (L.) Desv. ex. Ham.	-	Herb	RCO 2115

TABLE 2. CONTINUED.

SPECIES	COMMON NAME	HABIT	VOUCHER
<i>Panicum dichotomiflorum</i> Michx.	-	Herb	RCO 2116
<i>Panicum trichoides</i> Sw.	-	Herb	RCO 1930
<i>Panicum venezuelae</i> Hack.	-	Herb	RCO 2216
<i>Paspalidium geminatum</i> (Forssk.) Stapf	-	Herb	RCO 2230
<i>Paspalum fimbriatum</i> Kunth	-	Herb	RCO 2119
<i>Paspalum melanospermum</i> Desv. ex Poir.	-	Herb	RCO 2159
<i>Paspalum tumidum</i> Kuhlms.	-	Herb	RCO 2158
<i>Paspalum vaginatum</i> Sw.	-	Herb	Ribeiro14
<i>Setaria parviflora</i> (Poir.) Kerguélen	-	Herb	RCO 2196
<i>Sorghum bicolor</i> (L.) Moench	-	Herb	RCO 2236
<i>Steirachne barbata</i> (Trin.) Renvoize	-	Herb	RCO 2254
<i>Tragus berteronianus</i> Schult.	-	Herb	RCO 2150
<i>Urochloa fusca</i> (Sw.) B.F. Hansen and Wunderlin	-	Herb	RCO 2149
<i>Urochloa mutica</i> (Forssk.) T.Q.Nguyen	-	Herb	RCO 2156
Polygalaceae			
<i>Polygala boliviensis</i> A.W.Benn.	-	Herb	RCO 2203
<i>Polygala</i> cf. <i>bryoides</i> A.St.Hil. and Moq.	-	Herb	RCO 2133
Polygonaceae			
<i>Coccoloba</i> sp.	-	Tree	ASS 49
<i>Triplaris gardneriana</i> Wedd.	coaçu	Tree	ASS 18
sp.	cipó-verdadeiro	Liana	RCO 2335
Pontederiaceae			
<i>Eichhornia crassipes</i> (Mart.) Solms	aguapé	Herb	RCO 1813
<i>Heteranthera seubertiana</i> Solms	-	Herb	ASS 6
Rhamnaceae			
<i>Ziziphus joazeiro</i> Mart.	-	Tree	No voucher
Rubiaceae			
<i>Borreria capitata</i> (Ruiz and Pav.) DC.	-	Herb	RCO 1934
<i>Borreria scabiosoides</i> Cham. and Schltldl.	-	Herb	RCO 2154
<i>Diodella apiculata</i> (Willd. ex Roem. and Schult.) Delprete	alecrim-do-pasto	Herb	RCO 2185
<i>Machaonia brasiliensis</i> (Hoffmanns. ex Humb.) Cham. and Schltldl.	-	Tree	ASS 44
<i>Spermacoce tenuior</i> L.	-	Herb	RCO 2131
<i>Tocoyena formosa</i> (Cham. and Schltldl.) K.Schum.	jenipapo	Tree	RCO 2170
<i>Tocoyena sellowiana</i> (Cham. and Schltldl.) K.Schum.	jenipapo	Tree	ASS 40
Santalaceae			
<i>Phoradendron bathoryoctum</i> Eichler	erva-de-passarinho	Hemi-parasite	ASS 52
Sapindaceae			
<i>Cardiospermum halicacabum</i> L.	-	Liana	RCO 2225
<i>Cardiospermum</i> sp.	saia-de-acauã	Liana	RCO 1969
<i>Paullinia</i> sp.	-	Liana	RCO 2134
<i>Paullinia pinnata</i> L.	-	Liana	RCO 1937
<i>Sapindus saponaria</i> L.	sabonete	Tree	ASS 41
<i>Serjania comata</i> Radlk.	saia-de-coã	Liana	RCO 2304
sp.1	-	Tree	ASS 20
Sapotaceae			
<i>Sideroxylon obtusifolium</i> (Humb. ex Roem. and Schult.) T.D.Penn	quixabeira	Tree	Não coletada.
Scrophulariaceae			
sp.1	-	Herb	RCO 2210
sp.2	-	Herb	RCO 1956
Solanaceae			
<i>Lycium martii</i> Sendtn.	-	Tree	RCO 2350
<i>Solanum paniculatum</i> L.	jurubeba	Herb	ASS 21
sp.1	-	Sub-shrub	RCO 1816
sp.2	-	Herb	RCO 2125
Urticaceae			
<i>Laportea aestuans</i> (L.) Chew	-	Herb	RCO 1932
Verbenaceae			
<i>Avicennia germinans</i> (L.) L.	mangue	Tree	RCO 2353
<i>Avicennia schaueriana</i> Stapf and Leechem. ex Moldenke	-	Tree	Ribeiro 87
<i>Lantana camara</i> L.	camará	Sub-shrub	ASS 29

TABLE 2. CONTINUED.

SPECIES	COMMON NAME	HABIT	VOUCHER
<i>Lantana fucata</i> Lindl.	erva-cidreira	Sub-shrub	RCO 1927
<i>Lippia alba</i> (Mill.) N.E.Br.	-	Sub-shrub	RCO 1955
<i>Lippia gracilis</i> Schauer	-	Sub-shrub	RCO 1928
<i>Lippia</i> sp.	-	Herb	RCO 2117
<i>Stachytarpheta coccinea</i> Schauer	-	Shrub	RCO 2215
Vitaceae			
<i>Cissus verticillata</i> (L.) Nicolson and C.E.Jarvis	-	Liana	ASS 47

TABLE 3. Total number of tree taxa, exclusive and common to the riparian vegetation of the rivers and the Sørensen index: PB = Taperoá, Paraíba (Lacerda et al. 2005); PE = Pajeú, Pernambuco (Souza and Rodal 2010) and RN = Apodi-Mossoró, Rio Grande do Norte (present study).

	EXCLUSIVE TAXA/ TOTAL			TAXA COMMON TO AREAS			
	PB	PE	RN	PB/PE	RN/PB	RN/PE	RN/PB/PE
	18	08	46	11	23	17	09
Total/Sørensen	43	25	77	0,32	0,38	0,33	0,12

ACKNOWLEDGMENTS: To Petrobrás Ambiental, who financed this study. The riverside communities of Apodi-Mossoró river, for the great contribution in the field-work and locating specific species, and especially, Sr. Luiz Belo and family from Luis Gomes. To taxonomic specialists that helped in identifications: José Iranildo M. Melo (Boraginaceae); Julio A. Lombardi (Vitaceae); Ana Luiza Cortez (Acanthaceae); Christopher W. Fagg (Fabaceae); Elnatan Bezerra de Souza (Rubiaceae); Sergio Romaniuc (Urticaceae); José Floriano Barêa Pastore (Polygalaceae); Rubens Luiz Gayoso Coelho (Sapindaceae); Luisa Senna (Amaranthaceae); Gracineide Almeida (Asteraceae); Lidyanne Aona (Commelinaceae) and João Bringel (Asteraceae and Labiatae).

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RECEIVED: November 2012

ACCEPTED: August 2013

PUBLISHED ONLINE: August 2013

EDITORIAL RESPONSIBILITY: Pedro V. Eisenlohr

List of Angiosperm species of the riparian vegetation of the Apodi-Mossoró river, Rio Grande do Norte, Brazil

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ERRATUM

ON PAGE 740: Apodi – Mossoró **should be read as** Apodi-Mossoró.

ON PAGES 740, 741 AND 743: Apodi Mossoró **should be read as** Apodi-Mossoró.

ON PAGE 740: mineral exploration **should be read as** mineral exploitation.

ON PAGES 740 AND 741: Governor Dix-Sept Rosado **should be read as** Governador Dix-Sept Rosado.

ON PAGE 740: Andrade Lima **should be read as** Andrade-Lima.

ON PAGES 740 AND 743: Paraíba **should be read as** Paraíba.

ON PAGE 741: Planaltos Residuais **should be read as** residual elevated plains.

ON PAGE 742: The correct caption **should be:**

FIGURE 2. Some herbaceous species of Apodi-Mossoró River, Rio Grande do Norte, Brazil. HYDROLEACEAE: A. *Hydrolea spinosa* L.; MARANTACEAE: B. *Thalia geniculata* L.; ALSTROEMERIACEAE: C. *Bomarea edulis* (Tussac) Herb.; ACANTHACEAE: D. *Ruellia asperula* (Mart. and Nees) Lindau; CUCURBITACEAE: E. *Rytidostylis amazonica* (Mart. ex Cogn.) Kuntze; F. *Luffa operculata* (L.) Cogn.; POACEAE: G. *Echinochloa polystachya* (Kunth) Hitchc.; CYPERACEAE: H. *Pycurus polystachyos* (Rottb.) P. Beauv.

ON PAGE 742: The correct caption **should be:**

FIGURE 3. Some tree and shrub species of Apodi-Mossoró River, Rio Grande do Norte, Brazil. FABACEAE: A. *Erythrina velutina* Willd. SAPINDACEAE: B. *Sapindus saponaria* L. Fruits; APOCYNACEAE: C. *Cryptostegia grandiflora* R. Br., Invasive species; FABACEAE: D. *Geoffroea spinosa* Jacq.; POLYGONACEAE: E. *Triplaris gardneriana* Wedd. Fruits; CHRYSOBALANACEAE: F. *Licania rigida* L. Benth. Roots; FABACEAE: G. *Albizia inundata* (Mart.) Barneby and J.W. Grimes; ARECACEAE: H. *Syagrus cearensis* Noblick.

ON PAGE 743: Ranga and Rao 2005 **should be read as** Rezende and Ranga 2005.

ON PAGE 743: Andrade-Lima (1982) and Andrade Lima (1982) **should be read as** Andrade-Lima (1981).

ON PAGES 743 AND 744: Luiz Gomes **should be read as** Luís Gomes.

ON PAGE 744: “algarroba” **should be read as** “algaroba”.

ON PAGE 750, THE FOLLOWING REFERENCE IS LACKING:

Barros, T.C.L., O.C. Lira, and A.J.R. Silva. 1988. Distribuição geográfica das Pteridófitas ocorrentes no Estado de Pernambuco, Brasil. *Acta Botanica Brasílica* 2(1-2): 47-86.

We regret these errors.

September 2013