PROJECT

“The Biota of Boa Nova region: a baseline for a conservation plan”

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PROJECT SUMMARY

Boa Nova region contains two highly threatened vegetation types, the *mata de cipó* (deciduous dry forest), and humid patches of Atlantic forests. The region is well known by bird specialist as a critical spot for the Globally Endangered **Golden-tailed Parrotlet** *Touit surda*, **Striated Softtail** *Thripophaga macroura*, **Slender Antbird** *Rhopornis ardesiaca*, **Bahia Tyrannulet** *Phylloscartes beckeri*, **Fork-tailed Pygmy-tyrant** *Hemitriccus furcatus*, and **Buff-throated Purpletuft** *Iodopleura pipra*. Indeed, the Bahia Tyrannulet was discovered in the 1990s at Boa Nova. Another nine vulnerable and ten near-threatened bird species occur there. Boa Nova is an important site for other taxa as well, including mammals, reptiles, amphibians, ants and plants. However, basic ecological information for most species is preliminary at best, particularly concerning the local flora (Vinha *et al.* 1975; Mori & Boom 1981; Soares Filho 2000). Despite its striking importance the region has been suffering a severe process of deforestation and fragmentation, and no conservation units are present as all forest remnants are private owned. This situation puts the region among the top fifteen IBAs in the Brazilian Atlantic Forest Region. The protection of Boa Nova is a priority for conservation, if we are to avoid future extinction in the Atlantic forests of Brazil (MMA/SBF 2000).

Here we propose to conduct the first systematic survey of the biota of Boa Nova forest remnants, including broader biological groups such as plants, invertebrates and vertebrates. The data basis will provide the reliable information needed to assess the distribution and abundance patterns of some endemic and threatened species of the local flora and fauna. This baseline will support a broader conservation policy which will encompass the selection and establishment of conservation units, the diagnosis of vulnerable species and forest restoration. It is also expected to increase the public awareness about the importance of the local forest patches. Awareness will be achieved through presentation of results to local stakeholders: governmental agencies, schools and local NGOs.

Key words: Biota, Boa Nova, biological inventory, conservation.

Introduction

Originally covered by a mosaic of different types of vegetation, the landscape within the Planalto Sul Bahiano has long been altered due to the spread of cattle raising and coffee plantations (Leite 1976), and is continuously being affected by timber extraction from the few remnant forest fragments (Vinha *et al*. 1975; Mendonça 1978; Soares Filho 2000). Currently, forest fragments in the size of 100-300 hectares are isolated within a sea of pastureland. Adjacent to some tall rainforest fragments are patches of "*mata de cipó*", which houses several threatened species as well. The *mata de cipó* is one of the most threatened, least known and unprotected forest type in Bahia state (Mori & Boom 1981). Actions to conserve these habitats are dire needed given its low resilience after fragmentation and further disturbance by fire, ending up with the replacement by caatinga and more open vegetation (Vinha *et al*. 1975; Brasão & Araujo 1981). The importance of Boa Nova Region for the species conservation of Mata Atlântica becomes evident, as this area is identified as a top priority spot among different conservation strategies:

- *Considered an* Endemic Bird Area *(EBA072) by BirdLife International due to the presence of two restricted-range species.*
- *Considered an* Important Bird Area *(IBA) by BirdLife International because of the number of threatened and endemic species it houses.*
- *Together with Serra da Ouricana, Boa Nova is considered as a* Key Area for Threatened Bird Species in the Neotropics *by BirdLife International because of the diversity, endemism and threat to the avifauna (Wege & Long 1995).*
- *Considered by the Brazilian Government as a* Priority for Conservation of Biodiversity in the Atlantic Forests of Brazil *(MMA/SBF 2000). This classification was coordinated by several government and non-government organizations, among them Conservation International-Brasil, Fundação SOS Mata Atlântica, Fundação Biodiversitas, and Instituto de Pesquisas Ecológicas.*
- *Lies within the* Central Corridor *proposed by the Brazilian Government, where patches of remaining forests are to be connected by agroforestry or reforestation practices, to preserve the biodiversity of the entire region.*

Although no previous systematic survey on the local biodiversity has been taken place in Boa Nova, some information can attest its striking importance:

- *Diversity of 220 bird species (Gonzaga* et al*. 1995);*
- *Fifteen bird species threatened with extinction, 12 of which are from the Atlantic rainforest;*
- *Ten bird species considered near-threatened with extinction;*
- *One bird species described from the area, the Bahia Tyrannulet* Phylloscartes beckeri*;*
- *Two restricted-range bird species (geographic distribution less than 50,000 km^2);*

- *Two bird species are not protected in any known conservation unit: Slender Antbird* Rhopornis ardesiaca *and Narrow-billed Antwren* Neorhopias iheringi*;*
- *New species of ants in the genera:* Pachychondyla*,* Heteroponera*, and* Camponotus*; possibly endemic to the region (Jacques H.C. Delabie, pers. com.);*
- Presence of five threatened mammal species in the region: *Leontopithecus chrysomelas, Cebus xanthosternus*, *Chaetomys subspinosus, Callicebus melanochir*, and *Bradypus torquatus*
- *At least four plant species endemic to the nearby regions in the genus:* Diplotropis *(Lews 1987)*, Metrodorea*, and* Melocactus *(Soares-Filho 2000);*
- *Range extension of the fresh water turtle* Hydromedusa maximiliani*, listed as vulnerable by IUCN, and previously known only from Espírito Santo down to São Paulo.*
- *Six range extensions for snakes from Southern Atlantic forests in the genera:* Echinanthera, Xenodon, Tropidodryas, Oxyrhopus, Simophis *and* Uromacerina*, the former four are Atlantic Forest species,* Simophis *is from cerrado vegetation, and the latter is poorly represented in collections worldwide (Argôlo 1998a, 1998b, 1999a, 1999b, 2001a, 2001b).*

Little information is available on the basic ecology of most species, including their distribution among the vegetation units, feeding habits and their natural abundance.

Considering the fact that most of the remaining forest in the region is private owned, land farmers will be the most important stakeholders involved in any regional conservation plan, as they can effectively influence the total amount of forest available for conservation units. Local people living on villages, on the other hand, can also be considered as important vectors to reduce the hunting, logging and other man-related activities that are degrading the forest qualitatively. Taken this into account, it is expected to increase the local and national community awareness, by showing the key scientific results to the general public, governmental agencies and to the scientific community. A policy document to be written in Portuguese will be made available to the IBAMA, INCRA and other governmental agencies and NGOs providing the biological guidelines supported by the project's findings, including suggestions about implementation of natural reserves. Talks will be carried out periodically to local farmers and school children.

Boa Nova region is a focus of increasing conservation concern because it supports a biologically rich vanishing forest. However, except for a few biological groups such as primates and birds, biological information for other taxa is rudimentary at best. It is expected that this first biological survey, comprising a systematic protocol of a biological sampling procedure coupled with a study of the local landscape, will provide a better diagnosis of the biological status of the two forest types that once predominated at Boa Nova region: the *mata de cipó* (liana forest) and the humid forest. This information has been dire needed to support more efficient conservation actions, such as the selection of potential areas for the establishment of conservation units, public or private owned. This survey will also provide the baseline required to address issues from forest recuperation to landscape restoration. In addition, the current project will represent an unique opportunity

to provide field assistance to a team of young students, contributing to formation on PhD., M.Sc. and Graduate programs.

Aims and Objectives

Project Aim:

The project aims to conduct the first systematic, comprehensive baseline inventory of the biota from the Boa Nova region. Therefore, the specific objectives of this study are sixfold:

1. To develop a GIS data basis, mapping out existing forest cover in this region;

2. To describe the floristic and structure of the two main forest types of the Boa Nova region: the *mata de cipó* (liana forest) and humid tall forest patches of Atlantic forests (including Upper Montane Rain forest and Semideciduous forest);

3. To provide a reliable data base on species composition, distribution and abundance for woody plants, ants, termites, birds, bats and large terrestrial mammals;

4. To survey the current conservation status of some selected forest remnants, considering the biological parameters assessed as indicators (plant and animal communities);

5. To provide training opportunities for local students on the conduction of biological surveys, including the planning, data assessment and analysis. This project will provide a unique opportunity for training local both under and graduate students on the field of biological inventories and conservation biology. This is quite important once local universities are not on the priority of most national funds for education.

6. To allow local people to learn new skills by hiring field assistants.

Material and Methods

Surveys were conducted in the municipalities of Boa Nova and Poções. The region is located on the north end of Vitoria da Conquista Plateau, and is also where the plateau is substituted by mountains.

Vegetation that covers the region encompasses several types of forest included in the definitions of Decree 750 of Brazilian government to Mata Atlântica biome, which includes Montane Rain forests in the eastern slopes, and the seasonal formations in the top of the hills and plateau (See Morelato & Haddad, 2000, for definitions). The sesasonal formations included Semideciduous forests and liana forest (deciduous). There are also the dry caatinga formations (non forests) in the western parts. The vegetation follows a gradient of humidity and rainfall distribution (Gouvea et all 1976). All those forests types are extremely reduced by deforestation and fragmentation, and the deforestation processes are still occurring.

Vegetation maps from the region included Montane Rain forests and Semideciduous Forests in one vegetation type, and called it Mesophyllous forests (Gouvea el all 1976 – figure 1), but during the field work we realize that the eastern slopes were covered by non seasonal forests, and they have some differences in species composition and structure.

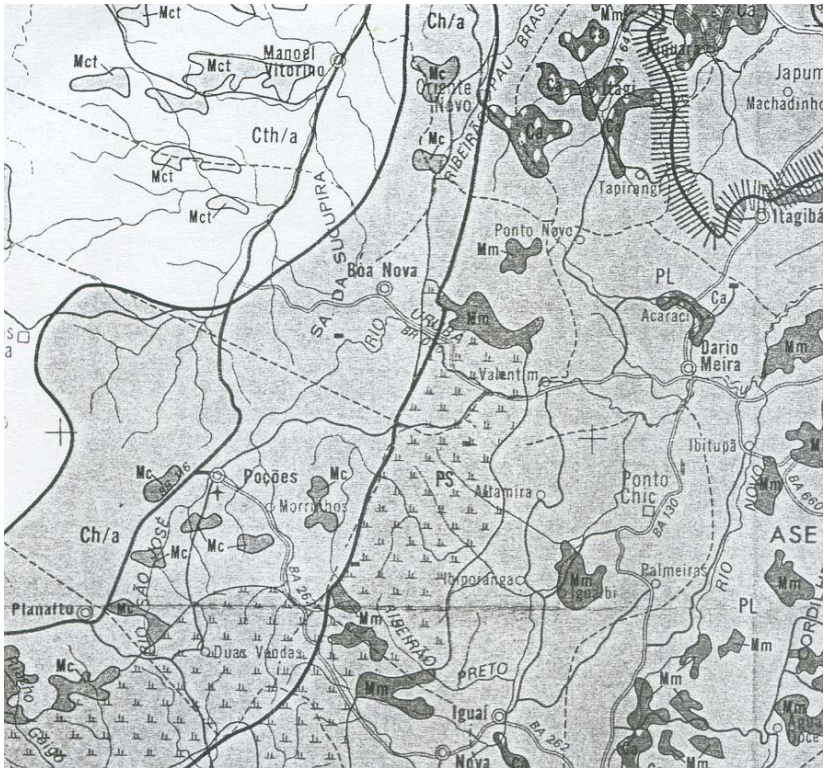

Figure 1 - Vegetation map of Boa Nova region from Gouvêa et al (1976), with municipality's location. Mm – Mesophyllous forests, Mc – liana forests, Ch/a secondary liana forest, Pl – pasture, Ps - abandoned pasture, Ca – cocoa plantaions, planted on the Rain forest region, Cth/a – caatinga (non forest dry formations), Mct – arboreal caatinga.

Landscape recognition:

Using satellite imagery from the Boa Nova Region, treated with a non supervised classification – NDVI, the project has mapped all the forest remnants. After several field trips to make the ground-thruting, we could distingue the humid tall forests and the *mata de cipó* patches from the other landscape categories (see figure 7 in the Results).

Sites selection:

The map of the forest fragments allowed us to select the largest patches of each forest type to be studied. We pull together the Montane rain forest and the Semideciduous forests in a class of Humid forests because it was very difficult to separate them in satellite image, and also in the field during the rainy season. In several forest fragments from plateau boundaries and the top of the hills, these two forests types also form a continuum. In certain forest patches where habitat loss processes do permit, the humid forest formations also reach liana forests. After the site selection using satellite images, we search in the field the largest fragments and evaluate their location, access conditions and preservation status to decide which fragments were the best areas to survey.

The second step was to find the owners of the lands where the forest patches are located, and gather their permission to work. After several field trips, with meetings and interviews with the land owners, we get permissions to work on two humid forest patches in Poções, and one liana forest fragment in Poções and other liana forest in Boa Nova, resulting in two fragments of each type of forest.

Sites description

Each site has a name that was used for all researchers in their analysis. The names used indicate the name of the land owner or the location of the site.

Site 1 – "Leoncio": A humid forest that belongs to a forest fragment located in the top of a hill, in the municipality of Poções. The entire fragment is larger and is irregularly in shape. In this fragment we also have a continuum which includes humid forest, semideciduous and liana forest, in the same forest patch.

The Canopy heights 16 to 20 m and the emergent trees reaches 28m. The canopy cover presents several openings due to tree fall gaps and also originated by selective logging activities. The fragment boundaries were also altered by fire that came from an abandoned pasture besides. The area has suffered selective logging activities, and the most affected specie was *Melanoxylum brauna* – Leguminosae *sensu lato*, as a pattern that the team has sawn in several studies in Southern Bahian forests. Despite the absence of adults and seedlings of *M. brauna* (we saw only sprouts from the cut trunks, and saplings > 2m), we saw in the area populations of other threatened species that are also searched by logging extractors such as *Tabebuia serratifolia* and *Astronium graveolens*.

Figure 2. Interior of the site “Leoncio”, the man in the picture is Alberto Vitoria alias “Beto”. He is the owner of one liana forest site in Poções, and has also helped us to find the other sites and introduced us to local person.

This forest has several species of epifitic bromelias and orchids which was very frequent, and there are few terrestrial bromelias (figure 2).

Site 2 – “João Guilherme”. The other humid forest, it belongs to the same fragment that includes the “Leoncio” site. This is a Semideciduous forest and has also tall trees (figure 3), with canopy heights from 12 to 18 meters and emergent trees reaching 25 meters. The forest is near to an ancient road of logging, and has also suffered with this activity.

This forest also has several epifictic orchids and bromelias, and there was few terrestrial bromelias. There was less trees species than the other humid forest, and some dominant species were particularly frequent.

Site 3 - “Beto”. This is a liana forest fragment, it is close to the humid forest sites, and is also located in the municipality of Poções. This forest has the smallest canopy cover, trees heights 6 to 8 meters, rare emergent trees reaches 15 meters. Canopy is open and large amount of light reaches the forest floor, and the understory is very dense with a lot of lianas.

Figure 3. A 22 meters height individual of *Cedrela odorata* on the site "João Guilherme".

Despite the dry appearance of this forest, the trunks have a lot of small orchids, bromelias, and lichenes due to high air humidity. Particularities of local physiography where these forests are located, on the top of the hills and plateaus, allow liana forests of Boa Nova region to receive a lot of humidity from mists. Even if this particularly site rainfall barely reaches 700mm/year (personal communication from the local farmers), this forest can sustain several epifitic species. Also because of the high humidity and large amount of light that reaches the forest floor, the site has a lot of terrestrial bromelias (Figure 4). Bromelia rosette's density was so high in certain locations that were very difficult to walk.

Figure 4. Liana forest of the site “Beto”.

Figura 5. Liana Forest of Boa Nova.

Site 4 - Boa Nova. This liana forest site is located in the municipality of Boa Nova, it has an open canopy that heights 11 to 14meters with emergent trees up to 18 meters. This forest is taller than the other liana forest site, and has a mixture of humid and liana forest plants species. The trunks also have a lot of epifitic species, which indicates high air humidity, and the forest floor has a lot of terrestrial bromelias. The understory is very dense, with a lot of lianas (figure 5).

Surveys

Most of the team members are familiar with the procedures needed to survey their particular biological group, but a training period were necessary to provide field identification and skills training on project planning and site selections for the students.

After a site selection, the team established sampling transects (200m long) in each selected area, and all the biological survey were carried out along the same transects or, when required, using these transects as a reference point. This procedure was successfully applied by the team in previous similar projects (www.restauna.org), representing a strategy to survey the same environmental heterogeneity for the different studies. For all biological groups data was obtained on species composition, richness and abundance. Survey techniques encompass a variety of methods, depending on the biological group considered, and they will be showed in the individual reports from each group studied.

Socioeconomics and Stakeholders Analyses

During this work we could make contacts with person, local NGO, Governmental Agencies, and we could make a partnership with BirdLife Brazil. This partnership allowed us to make the Map of Forest fragments of Boa nova region, and our field work and contacts helped them to make their Feasibility Study for Conservation Plan of Boa Nova Forests. This resulted in a report which contains a complete study of environmental factors, socioeconomics, threats and viability for a conservation plan for the region. Here, with their permission we will present the executive summary of this report.

RESULTS

1. Location of the principal forest fragments and other landscape elements of Boa Nova region.

After several field trips From May to August of 2003 we gather geographical position information about the humid and liana forest fragments. During the travels we actualized the forest fragments map, and also identified the humid and liana forest patches, secondary forest patches and other types of soil covering in a satellite image classified using NDVI method, and verifying the accuracy of this methodology.

With the global position of the forest patches and other kind of soil cover, gathered with the GPS during the field trips, we could elaborate a first version of "Forest Remnants of the cities of Boa Nova and Poções Map", that was produced in collaboration with BirdLife-Brasil (figure 6).

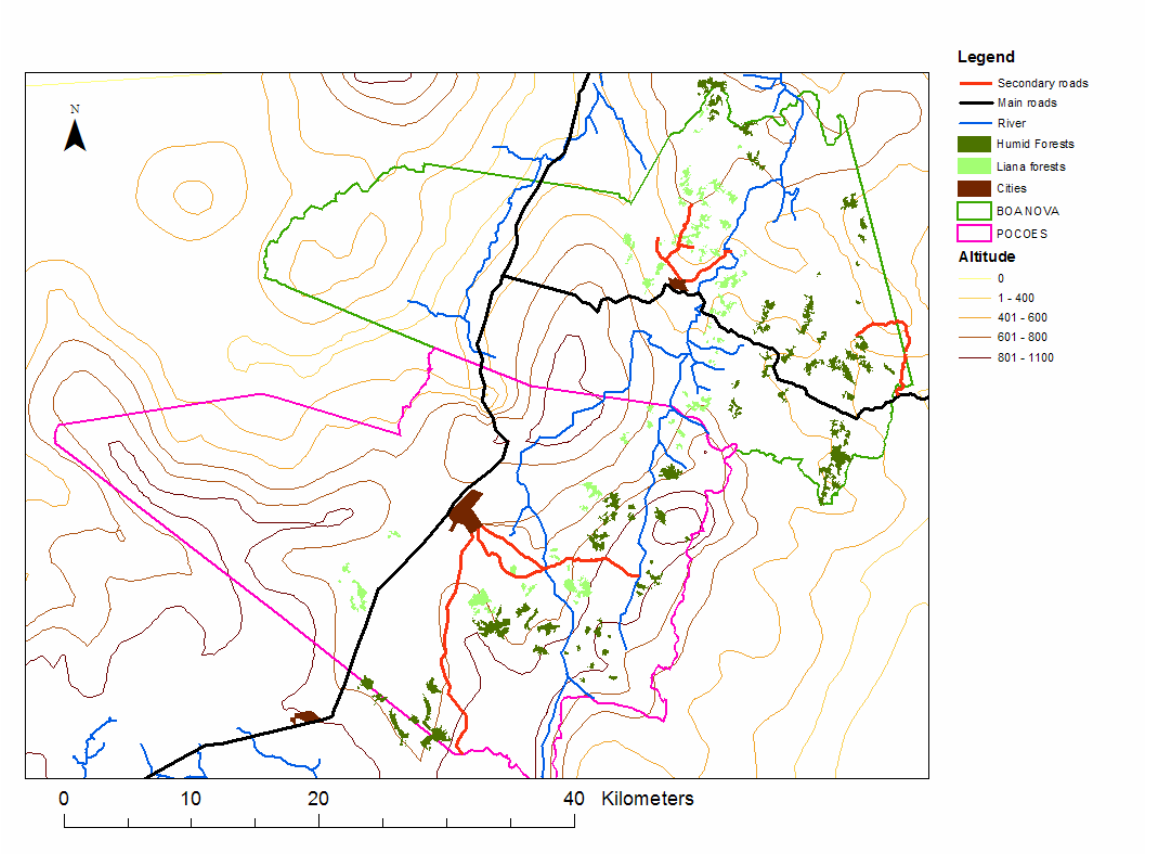

Figure 6. Forest Remnants of the cities of Boa Nova and Poções. Rain forests and Semideciduous forests were pull together as Humid Forests.

2. **Feasibility Study for a Conservation Plan of Boa Nova Forests, Bahia, Brazil**

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Authorized by BirdLife Brazil.

Boa Nova is a municipality in the State of Bahia that relies mainly on cattle raising and a mixed subsistence and cash-cropping agriculture with beans, manioc, corn and bananas, in addition to coffee, cocoa and other minor crops. The municipality spans into several vegetation formations, from xerophytic formations of the Caatinga in the western portion, to humid forests in the eastern borders. Amongst these formations, the municipality is well known by the Cipó forests, a dry deciduous woodland with large bromeliads on the ground. This formation is naturally rare and small in extension, and is severely threatened of disappearance in the near future. The Cipó forests are globally important, because they house endemic birds, plants and other species. Amongst the birds, the Slender antbird *Rhopornis ardesiaca* is the best known endemic bird, only recently encountered in another geographical location. Alongside Cipó forests, another formation severely threatened in Boa Nova are the semi-deciduous formations of the interior. Besides housing several endangered bird species, these transitional forests are unusual in housing plants and animals from both the Caatinga and wet Atlantic forests of the coast.

The local riches of Boa Nova biota, however, contrast with the local socio-economic indicators. Boa Nova is one of the poorest municipalities in the state of Bahia and indeed appears in some of the statistics as the poorest locality. Most of the municipality is enclosed in small farms with less than one hectare, and most of the population, including urban residents, relies on the primary sector. A very poor segment of the society is landless yet still relies on the primary sector and illegal extractive activities. Due to the stagnant economic activity and the present reliance on cattle raising, a labour-poor activity, the poor segment of Boa Nova society is very dependent on forest resources for their subsistence and cash acquisition.

To conserve Boa Nova threatened habitats and, most importantly, the disappearing Cipó forests, strict conservation measures such as the creation of public or private protected areas are needed. However, the socio-economic situation and the threats caused by the landless population means that protected areas will have little success if not combined with other indirect conservation strategies. These strategies include incentives to land use changes towards labour intensive practices such as agroforestry, in addition to environmental education programs and finally increased enforcement of environmental regulation at the local level.

3. **Biota surveys.**

3.1 Vegetation.

Eduardo Mariano Neto and Robson B. Araujo

Despite its extreme importance for conservation of several threatened species and habitat types (MMA/SBF 2000), Boa Nova region is still an unknown area to science. It lacks even basic information about structure and composition of its forests (Vinha *et al.* 1975; Mori & Boom 1981; Soares Filho 2000). Even vegetation maps do not have some details from forest type's distributions.

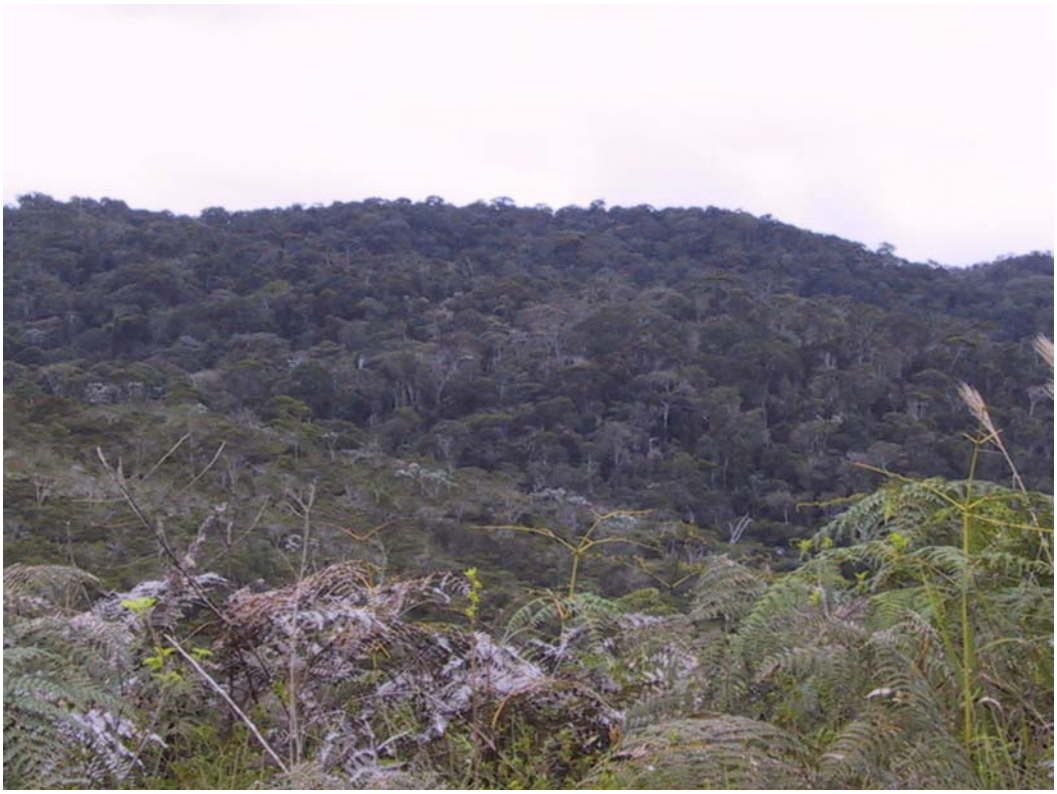


Figure 6. Atlantic Rain Forest covering the eastern slopes on Boa Nova BA.

The description of regional vegetation cover includes only the Semideciduous forests, liana forests and caatinga, besides secondary formations (figure 1 – Gouvea et al 1976). During this study, we realize that there was also Montane Rain Forests covering the eastern slopes, with several typically species from humid forest, such as *Euterpe edulis* (figure 7). *E. edulis* also occur in Semideciduous forests, but in Semidecioduous forests the specie is associate with river drainages.

We also noted that the liana forests of Boa Nova region are different from liana forests of other regions of Vitoria da Conquista Plateau. In other regions, there is a humidity gradient from the plateau eastern boundaries to interior, and there is a graduate

substitution of humid forests from these boundaries by semideciduous forests and deciduous forests (liana forests) in western direction (Gouvea *et. al.*, 1976; Araujo *et. al.*, 2003). The deciduous forest from the rest of Vitoria da Conquista Plateau are markedly drier, and has few or no epiphytic species comparing with liana forests from Boa Nova.

Figure 6. *Euterpe edulis* from Boa Nova Montane Rain Forest.

Methods

The analysis of vegetation structure and composition were carried out following the quadrat method (Mueller – Dumbois & Ellemberg 1974). Ten quadrats of 10x20m, and distant 10 meters from each other, were located in each study site, using project's transects as a reference. In each quadrat all trees > 5cm diameter were counted, measured in height and in diameter at breast height (d.b.h.), and when was necessary, they were collected for future identifications. The trees were tagged marked individually with aluminum tags. Species identifications will be made using bibliography, sending material to specialists and by comparing them with material already present in the herbaria of The Center of Cocoa Research (CEPEC) When information were available, species will be classified as shade tolerant or intolerant (Withmore 1998), an important ecological information.

Foliage profile, an important feature of forest structure, was assessed along each sampling transect using a method described in Malcom (1995). By using a 3 m pole to allow a vertical sighting we estimate the foliage intervals hitting this vertical imaginary line in eight forest vertical strata (0-1m; 1-5m; 5-10m; 10-15m; 15-20m; 20-25m; 25-30m and >35m).

In each quadrat we determine the terrestrial bromelia rosettes density, considered as important components characterizing distinct vegetation types. In five quadrats we count and measure all lianas to determine their density and basal area.

Partial results

We present here the partial results, the identifications are preliminary and several analyses weren't made yet, including the analyses of vertical foliage profile, and the other physical parameters of vegetation.

We sampled 1565 plants in all sites that belong to 125 species. The richest family was Leguminosae (*sensu lato*) with 25 species, followed by Myrtaceae with 23 species, Euphorbiaceae with 9 species and Rubiaceae with 8 species. (table 1). Surprisingly Erythroxylaceae contributes with a high number of species - 6, and an unexpected large number of arboreal individuals in all forests studied.

The two liana forests have a greater number of bromelia rosettes and greater total liana's basal area comparing with humid forest. One 200 m² quadrat of the site Beto we found 256 bromelia rosettes.

Table 1. Arboreal species found in all four sites of Boa Nova Region, grouped by Family. Identifications are still in preliminary stage.

Family	*Species*
Anacardiaceae	Anacardiaceae 1
Anacardiaceae	Tapirira guianensis
Annonaceae	Annona 1
Annonaceae	Annonaceae 1
Apocynaceae	Aspideosperma spruceanum
Apocynaceae	Aspidosperma 1
Apocynaceae	Aspidosperma 2
Asteraceae	Vernonia 1
Asteraceae	Vernonia 2
Bignoniaceae	Tabebuia 1
Bignoniaceae	Tabebuia serratifolia
Bombacaceae	Bombacaceae 1
Bombacaceae	Bombacaceae 2
Bombacaceae	Erioteca 1
Bombacaceae	Erioteca 2
Celastraceae	Maytenus 1
Celastraceae	Maytenus 2
Chrysobalanaceae	Licania 1
Clusiaceae	Clusia 1

Elaeocarpaceae	Sloanea 1
Erythroxylaceae	Erythroxylum 1
Erythroxylaceae	Erythroxylum 2
Erythroxylaceae	Erythroxylum 3
Erythroxylaceae	Erythroxylum 4
Erythroxylaceae	Erythroxylum 5
Erythroxylaceae	Erythroxylum 6
Euphorbiaceae	pau de leite
Euphorbiaceae	Sapium glandulatum
Euphorbiaceae	Sebastiania 1
Euphorbiaceae	Senefeldera multiflora
Euphorbiaceae	Sicurinega 1
Euphorbiaceae	Euphorbiaceae 1
Euphorbiaceae	Euphorbiaceae 2
Euphorbiaceae	Euphorbiaceae 3
Euphorbiaceae	Euphorbiaceae 4
Flacourtiaceae	Casearia commersoniana
Flacourtiaceae	Casearia 1
Flacourtiaceae	Casearia 2
Lauraceae	Endlicheria 1
Lauraceae	Lauraceae 1
Leguminosae	Anadenathera 1
Leguminosae	Anadenathera 2
Leguminosae	Bauhinia 1
Leguminosae	Copaifera 1
Leguminosae	Dialium 1
Leguminosae	Harleyodendron unifoliolatum
Leguminosae	Inga 1
Leguminosae	Inga 2
Leguminosae	Machaerium 1
Leguminosae	Melanoxylum brauna
Leguminosae	Mnimosa 1
Leguminosae	Peltogyne 1
Leguminosae	Swartzia 1
Leguminosae	Leguminosae 1
Leguminosae	Leguminosae 10
Leguminosae	Leguminosae 11
Leguminosae	Leguminosae 2
Leguminosae	Leguminosae 3
Leguminosae	Leguminosae 4
Leguminosae	Leguminosae 5
Leguminosae	Leguminosae 6
Leguminosae	Leguminosae 7
Leguminosae	Leguminosae 9
Malpighiaceae	Malpighiaceae 1
Malpighiaceae	Malpighiaceae 2
Meliaceae	Trichilia 1
Monimiaceae	Mollinedia 1
Myrtaceae	Campomanesia 1
Myrtaceae	Eugenia 1

Myrtaceae	Eugenia 2
Myrtaceae	Eugenia 3
Myrtaceae	Eugenia 4
Myrtaceae	Eugenia 5
Myrtaceae	Eugenia 6
Myrtaceae	Eugenia 7
Myrtaceae	Eugenia 8
Myrtaceae	Eugenia 9
Myrtaceae	Gomidesia 1
Myrtaceae	Gomidesia 2
Myrtaceae	Gomidesia 3
Myrtaceae	Marlierea 1
Myrtaceae	Myrcia 1
Myrtaceae	Myrcia 2
Myrtaceae	Myrcia 3
Myrtaceae	Myrcia 4
Myrtaceae	Myrciaria 1
Myrtaceae	Myrtaceae 1
Myrtaceae	Myrtaceae 2
Myrtaceae	Myrtaceae 3
Myrtaceae	Myrtaceae 4
Nyctaginaceae	Guapira opposita
Nyctaginaceae	Neea 1
Nyctaginaceae	Neea 2
Nyctaginaceae	Nyctaginaceae 1
Ochnaceae	Ouratea cf. conduplicata
Olacaceae	Heisteria 1
Olacaceae	Heisteria 2
Olacaceae	Olacaceae 1
Proteaceae	Roupala brasiliensis
Rubiaceae	Amaioua 1
Rubiaceae	Coussarea 1
Rubiaceae	Psychotria 1
Rubiaceae	Psychotria 2
Rubiaceae	Rudgea 1
Rubiaceae	Rubiaceae 1
Rubiaceae	Rubiaceae 2
Rubiaceae	Rubiaceae 3
Rutaceae	Esembeckia 1
Rutaceae	Rutaceae 1
Rutaceae	Rutaceae 2
Rutaceae	Rutaceae 3
Rutaceae	Rutaceae 4
Sapindaceae	Allophyllus 1
Sapindaceae	Cupania 1
Sapotaceae	Chrisophyllum 1
Sapotaceae	Chrisophyllum 2
Sapotaceae	Manilkara 1
Sapotaceae	Manilkara 2
Sapotaceae	Manilkara salzmanii

Sapotaceae	Micropholis venulosa
Sapotaceae	Pouteria 1
Sapotaceae	Pouteria 2
Sapotaceae	Pradosia lactescens
Unknown 1	Unknown 1
Unknown 2	Unknown 2

Despite the lack of precise species identification it was possible to note the dominance of two species of Rutaceae in the sites. One specie is particularly frequent in the sites João Guilherme (Semideciduous) and Boa Nova (liana forest), and the other Rutaceae is frequent but exclusive in the site Beto (liana forest).

We also found several orchid species in all four sites, and one is probably new specie of *Masdevalia* (figure 7). Other interesting orchid species found in this study was *Stanhopea graveolens*, *Sophronitis cernua*, *Leptotes bicolor*, *Laelia grandis*. and *Oncidium pulsilum*, and several other species of *Catasetum*, *Epidendrum*, *Maxillaria*, *Octomeria*, *Oncidium* and *Pleurothalis*,

Figure 7. A probably new *Masdevalia* from the site João Guilherme.

Besides several new species, new registers for the region, and enlargement of species geographical distribution, we also found that the Boa Nova liana forest is a particular forest physiognomy, with strong seasonality but high humidity from mists, which permit s the developing of a complex epiphytic community. We also noted that this forests occupy a narrow strip between the humid forests from the eastern slopes of the north end of Vitoria da Conquista Plateau and the dry caatinga in the west slopes, and despite its extremely uniqueness and importance, this forests are being reduced, several liana forests

patches of Boa Nova and Poções were transformed in pastures during the short period of this work.

Analyses are preliminary, but we could note the absence of adults and seedlings of *Melanoxylum brauna* in all sites. The specie is "hunted by local extractor because of the resistance of its wood, and is used principally to build fences for cattle. This pattern was also noted by the team in studies in Una and Vitoria da Conquista region (Mariano Neto – unpublished data)

The next step is to make the species identifications, the data analysis, and compare this data with those obtained in Vitoria da Conquista Region.

3.2 Termites

Yana Teixeira

Introduction

The majority of termite species are found within tropical latitudes (24°N-24S°) although some species reach 45°. Termites are common in all rain forests.

In rain forests, termites (Isoptera) are abundant but secretive insects, usually concealing and protecting themselves in the soil or in nests and foraging galleries. Their ability to feed on dead plant materials makes them an extremely important component of the forest.

I chose termites as the insect group to study because they are taxonomically tractable an have great functional importance: termites are the most important arthropod decomposers in tropical rain forest; and are vital in maintaining decomposition processes and nitrogen and carbon cycles. They are sensitive to disturbance, especially to forest canopy loss.

Methods

Sampling

I ran six transects, 100m long by 2 m wide at each site; Transect were divided into five sections; each 5 m long separated 10m of each other. In each section I spent one man-hour searching for termites: (1) About of surface soil; (2) Dead wood with a diameter of > 1 cm was broken open and termites were removed; (3) Tree trunks and buttress roots were examined. Particular attention was paid to the deep accumulations of litter and organic-rich soil between buttresses. (4) Nests were opened and termites collected.

Termites of both the soldier and work castes were collected and stored in 90% ethanol.

Results

I found in all sites 29 termite species, four of them are new to science. There are four families in the Neotropical region (Kalotermitidae, Rhinotermitidae, Serritermitidae and Termitidae), only three families was met in the present study.

The Kalotermitidae (dry wood termites) are often difficult to find, but probably occur in small numbers in all rain forests. They are vritually confined to dead limbs and trunks in the canopy, perhaps as a result of competitive exclusion by the more advanced Termitidae. We found two species of this family.

The most important family of lower termites in rain forest is the Rhinotermitidae (damp wood termites). They feed mainly in standing or follen trunks and limbs. *Heterotermes sulcatus* is tropicapolitan.

Over 70% of termite species are in the higher termite family Termitidae and in terms of species richness and population density they predominate in all tropical rain forests. The Apicotermitinae and the Nasutitermitinae were the subfamily more abundant. And the soil-feeding subfamily Apicotermitinae had 8 species and Termitinae was less

depicted. The subfamiy Apicotermitinae includes the soldierless termites, a significant component of forest soil, and their taxonomy is difficult.

Table 1:

Family	site 1	site 2	site 3	site 4
	Beto	J. Guilherme	Leoncio	Boa Nova
Kalotermitinae				
Tautaritermes vitulus	X			
Rugitermes sp 1	X			
Rhinotermitidae				
Heterotermes sulcatus				X
Termitidae				
Apicoterminae				
Anoplotermes sp 1	X	X	X	X
Anoplotermes sp 2			X	
Anoplotermes sp 4	X	X	X	X
Anoplotermes sp 5		X	X	
Anoplotermes sp 6				
Aparatermes sp 1	X			
Ruptitermes sp 1		X		
Ruptitermes sp 2	X			
Nasutitermitinae				
Armitermes sp 2		X	X	
Constritotermes sp 1	X	X		X
Diversitermes sp 1	X	X	X	X
Diversitermes sp 2	X	X		X
Diversitermes sp 3	X	X		X
Nasutitermes minor		X	X	X
Nasutitermes macrocephalus				X
Nasutitermes sp 4	X	X	X	
Nasutitermes sp 6		X	X	
Proconitermes romani	X	X	X	X
Subulitermes sp 1	X	X	X	X
Termitinae				
Dentispicotermes conjunctus	X		X	
Microcerotermes sp 1			X	
Neocapritermes opacus		X	X	
Neocapritermes brasiliensis		X		X
Neocapritermes angusticeps	X	X		
Termes medioculatus			X	
Termes sp 2			X	

3.3 Ants

Ivan Cardoso Nascimento and Adriany Leão

Introduction

Three to eight thousand of ant species live in neotropical rainforests. They constitute one of the largest portions of animal biomass. The enormous diversity is characterized by a large adaptative capacity, which permits the occupation of several ecological niches.

Ants are ideal tools to biodiversity studies, and also are conservancy or disturbance indicators of tropical ecosystems. This is due to the large number of species, good taxonomic knowledge and the efficiency in the surveys.

Boa nova region, located in Southwest region of Bahia state presents a large biological diversity, and it is also poorly known.

We present the partial results of Boa Nova region's mirmecofauna study, in these first report there will be the results from the first three forest fragments analyzed, the two liana forests and one humid forest of Poções (Leoncio).

Material and Methods

We surveyed 3 forest remnants located in the municipalities of Boa Nova and Poções – Bahia, Brazil. Litter ants were surveyed accordingly with the Winkler's extractor, accordingly with a protocol adopted by Delabie et al (1998). In each one of the three sites we surveyed 50 points, with minimum interval of 50 meters of each consecutive point. Biological material were studied in the "Laboratório de Mirmecologia do Centro de Pesquisas do Cacau", where ants were mounted. Identifications were made to species level, as always as possible, and we made a reference collection, that will be incorporated to Laboratory's scientific collection in the future.

Partial results

Until now, 41 genus and 87 species were identified (Table 1). The genus with the largest species numbers were *Pheidole, Brachymyrmex e Hypoponera,* following a common tendency to neotropical litter ants surveys.

Form the collected species, it is very special the presence of *Probolomyrmex brujitae*. The species belongs to a rare genus, with a Pantropical distribution. There are 3 species for South America (Agosti, 1994) and only one recently registered to Brazil (Delabie, 2001). The presence of *Probolomyrmex brujitae* represents the second register of the genus, and the first register of the species for Brazil, which was first collected in Jujui (Argentina), and is known from only two specimens.

Another species as *Amblyopone* sp and *Thaumatomyrmex* sp are certainly new species, meanwhile, its confirmation needs a taxonomic revision of the two genus.

It is very important to continue the survey activities in this region, because a great part of its myrmecological original fauna is steel poorly known, and the remaining habitat patches are very few in number, small in size and steel severely threatened by fragmentation and disturbance processes.

This study are extremely important because is the first myrmecological study in a severely threatened region, and also opens the possibility to make comparative studies with Bahian myrmecofauna. The team of "Laboratório de Mirmecologia" is also working on several another habitat remnants of Mata Atlântica in Southwest of Bahia State.

Table 1 – Number of species by genus on the three surveyed areas

Genus	**Number of species**
Amblyopone	1
Pachycondyla	3
Odontomachus	2
Anochetus	1
Wasmania	3
Linepthema	2
Camponotus	3
Dolichoderus	2
Megalomyrmex	2
Cephalotes	1
Pseudomyrmex	2
Strumigenys	3
Leptogenys	1
Octostruma	1
Pyramica	2
Atta	1
Gnamptogenys	1
Cyphomyrmex	2
Hypoponera	6
Ochetomyrmex	1
Discotyrea	1
Oxyepoecus	1
Hylomyrma	1
Rogéria	3
Leptotorax	1
Blepharidata	1
Ectatoma	1
Acropyga	1
Brachymyrmex	6
Carebara	1
Crematogaster	4
Neivamyrmex	1
Myrmelachista	1
Oligomyrmex	1
Paratrechina	3
Pheidole	13
Procryotocerus	1

Probolomyrmex	1
Solenopsis	3
Thaumatomyrmex	1
Trachymyrmex	1
41 genus	87 species

3.4 Spiders

Antonio Brescovit

Survey I – Winkler's Extractor

The use of Winkler's extractor to spider surveys is recent and in Brazil only two studies focusing spiders were made, they are recent works and are Dissertations (Barreiros, 2004; Ramos, 2004). Other works focusing spiders in general treat the group inside Class Arachnida, and they do not distinguish the collected material, even inside its several Orders (Praxedes et al. 2003; Pinho, 2003).

In this survey we collected 322 spiders using Winkler's Extractor, that includes 105 adults and 217 immature individuals. Four families Araneidae, Scytodidae, Anyphaenidae and Thomisidae were only represented by immature. Immature were identified only to Family level, the absence of genitalia do not allow the separation of the spiders in morph types. As preliminary results, we found 36 species of spiders distributed in 18 Families (table 1), almost exclusive soil animals. The only three exceptions could be credited to Oxyopidae, Philodromidae and Sparassidae, which species could be found on foliage of trees and bushes over the soil.

The families with greater number of individual were Salticidae with 74 spiders, 20% of them were adults, Zodariidae with 40 spiders, 17,5% were adults, and Palpimanidae with 35 spiders, 37% were adults.

The richest families were Salticidae with 5 species, and Palpimanidae, Theridiidae and Oonopidae, all of them with three species. Usually Salticidae and Theridiidae, plus Araneidae (represented here only by young individuals) were the most abundant in inventories. Oonopidae is a common soil group, with few species living in bushes, or under the bark of trunks (Dippenar-Schoeman & Jocqué 1997). We call attempts to the high number of Palpimanidae individuals, small spiders that have structures in their tarsus and metatarsus that are similar to some kind of receptors (Platnick 1975), and they move with their legs I up resembling an ant.

Within taxonomic news, we can highlight the high not described species. From the 36 colected species, at least one belongs to a genus not yet described of Pholcidae (Ninetinae), and there are at least 12 new species of Salticidae, Pholcidae. Palpimanidae, Ctenidae, Theridiidae and Zodariidae. The unique identified specie *Otiothops atlanticus*, described by Platnick et al. (1999), were known only from the municipality of Ilheus, in areas of Cocoa plantations near the shore, and its register is new for this region and for this type of drier forest formation.

Despite this relatively small first survey, it is possible to observe that the local fauna of spider is steel badly known and is represented by a large number of species unknown to arachnologists.

Table 1. Species list from three areas from Boa Nova and Poções, two liana forests and one humid forest (Leoncio), using Winkler's extractor.

Species List		
Family	Genus	Species
Anapidae	Gen. ?	
Caponidae	Nops	
Ctenidae	Celaetychaeus	
Gnaphosidae	Eilica	
Gnaphosidae	Camillina	
Hahniidae	gen. ?	
Linyphiidae	Gen. 1	sp1
Linyphiidae	Gen. 2	sp2
Corinnidae	Orthobula	
Miturgidae	gen. ?	
Oonopidae	Gamasomorphinae	
Oonopidae	Orchestina	
Oonopinae	Oonopinae	
Oxyopidae	Oxyopes	
Palpimanidae	Fernandezina	
Palpimanidae	Otiothops	atlanticus
Palpimanidae	Otiothops	
Philodromidae		
Pholcidae		
Pholcidae	Ninetinae	
Salticidae		sp5
Salticidae		sp1
Salticidae		sp2
Salticidae		sp3
Salticidae		sp4
Sparassidae	Olios	
Theraphosidae		
Theridiidae	Theridion	sp. 2
Theridiidae	Theridion	sp. 1
Theridiidae	Theridion	sp. 3
Zodariidae	Tenedos	sp1
Zodariidae	Tenedos	sp2

3.5 Bats

Fabio C. Falcão, José Marcelo O. Pimentel and Ana Carolina B. S. Costa

Introduction

Bats are critical contributors to mammalian biodiversity. The order Chiroptera is second only to rodents in diversity: 17 families, *ca* 174 genera, and 913 species (Koopman, 1994). Nine families live in the New World, six of which only occur in the Neotropics. Brazil harbors 137 species, distributed among nine families and 56 genera (Marinho-Filho & Sazima, 1998).

Members of the order Chiroptera are of particular importance in Neotropical rainforests because they constitute about 40–50% of mammal species, greatly influencing the species richness and diversity of mammals in these ecosystems (Fleming, 1988). Through the acquisition of food, in the form of plant and animal matter, bats participate in the recycling of nutrients and energy in the ecosystem (Fleming, 1982, 1988).

Patterns of distribution of Brazilian bats are yet poorly known, and basic data on natural history are missing for many species, if not all (Marinho-Filho and Sazima, 1998). More specifically, species accounts with more precise details on locality, study sites, and collections of reference are missing in compilations and checklists. Additionally, extensive areas in Brazil remain largely unsampled.

Bats are mobile animals with the potential to cover large distances in one night, easily crossing different vegetation types and landscapes that might constitute physical barriers for other species of mammals (e.g., Fleming 1988; Fenton 1997; Kalko et al. 1999. As a consequence, bats might not present the same regional patterns of diversity as other mammals of comparable size (Voss et al. 2001). Further, differences in the morphology and ecology of the species make some of them more suited to using specific habitats such as the spatially complex forest interior or the open areas above the canopy (e.g., Fenton 1994; Fenton et al. 1998; Bernard 2001).

Bats fill a variety of trophic roles in tropical forests, interacting with a large spectrum of organisms and acting as pollinators, seed dispersers, and predators of insects and small vertebrates (Findley 1993; Altringham 1996).

It has been suggested that bat tolerance to habitat loss and fragmentation may be related to their ability to traverse open areas to reach other forest fragments or other vegetation types and to use resources within the matrix (Law et al., 1999). However, the few available studies indicate that, in spite of their mobility and slow demographic turn-over, Neotropical bats seem to be sensitive to loss and fragmentation of their natural habitat, locally undergoing decreases in species diversity and size of populations (Estrada et al., 1993a; Brosset et al., 1996). In addition, a significant number of species consume nectar and great quantities of fruits. These bats act as pollen and seed dispersal agents for a broad spectrum of plant species, participating in the reproductive phenology of plants and rainforest regeneration (Heithaus et al., 1975; Heithaus, 1982).

In order to navigate and hunt their prey during the night, bats use high frequency sounds produced by their larynx, mostly above the frequency range audible to humans (ultrasounds) (Neuweiler, 2000). These echolocation calls provide an opportunity to unobstrusively survey and identify bats, especially when other conventional techniques (i.e. trapping and roost search) cannot be deployed (Oliveira, 1998).

In the Bahia state, information on bats from Bahia, state is represented for unpublished theses on community ecology in the Atlantic forest, in the southern region of the state (Faria, 2002) and survey of karstic areas (Santos, 2001).

Boa Nova is an important site for many taxa, including mammals, birds, reptiles, amphibians, ants and plants, but these groups are poorly studied Despite its striking importance, the region has been suffering a severe process of deforestation and fragmentation, and no conservation units are present as all forest remnants are private owned. This situation puts the region among the top fifteen IBAs in the Brazilian Atlantic Forest Region. The protection of Boa Nova is a priority for conservation, if we are to avoid future extinctions in the Atlantic forests of Brazil (MMA/SBF 2000).

As a step towards achieving a better understanding of the distribution of bat species and the faunal composition in the state of Bahia, we present the bat assemblage of Boa Nova region. Here in this report, we show the results that we obtained using three complementary techniques of bat survey: mist-nets, ultrasonic detectors and day roosts search.

METHODOLOGY

This study was conducted between October 2003 and March 2004 near in the Boa Nova region, Bahia, Brazil .

All bats were captured with mist nets set along existing 200 m long transect trails located at the centre of each of the 4 pre-selected forest fragments. We used 70m of mist-nets (6, 9 and 12m × 2.5 m) set at ground level and some were set between 6-8m high, which were opened at dusk and closed at 23:00-24:00h. Nets were closed during rain or wind storms.

Nets were checked every 30 minutes, and for each captured bat, we recorded body weight (g), sex, age, forearm length (mm) and reproductive stage (*eg.* pregnancy, lactation, large scrotal testes).Adult females were examined to determine if they were lactating (lactating females usually had enlarged mammary glands and in some cases milk secretion was evident during palpation of glands) and their abdominal area was palpated to assess presence of larger embryos (Fleming et al., 1972).

The captured bats were identified using the identification keys of Vizotto and Taddei (1973) and Lim and Engstrom (2001), and the unidentified ones were sacrificed for later identification. Voucher specimens of rare species, together with those whose identification was problematic were preserved in 70% ethanol and deposited in the reference collection of the Santa Cruz State University.

We also monitored the echolocation calls of aerial-feeding insectivorous species to complement our inventory. We recorded the first 2 hours after dusk, during 13 nights. We didn't record when was raining. Bats were surveyed using remotely deployed ultra-sonic detectors (Anabat II, Titley Electronics) (Figure 1). Automation was facilitated by using a Delay Switch (Titley Electronics) connected to a cassette-recorder (Marantz PMD 222 Professional) or a notebook. Delay switches operate by switching on the recorder at the sound of a high frequency call of an echolocating bat and downloading the call, time and a calibration tone onto one side of a 60 min cassette. This technique maximizes the nightly sampling period, thus increasing the chance of detecting rare species (Law et al., 1998). Recorded calls were analyzed with Anabat 6 DOS software by comparison with those reported in the literature (e.g., O'Farrell and Miller 1997, 1999).

We also searched for day roosts in fallen or oak trees, and also in abandoned houses that we found.

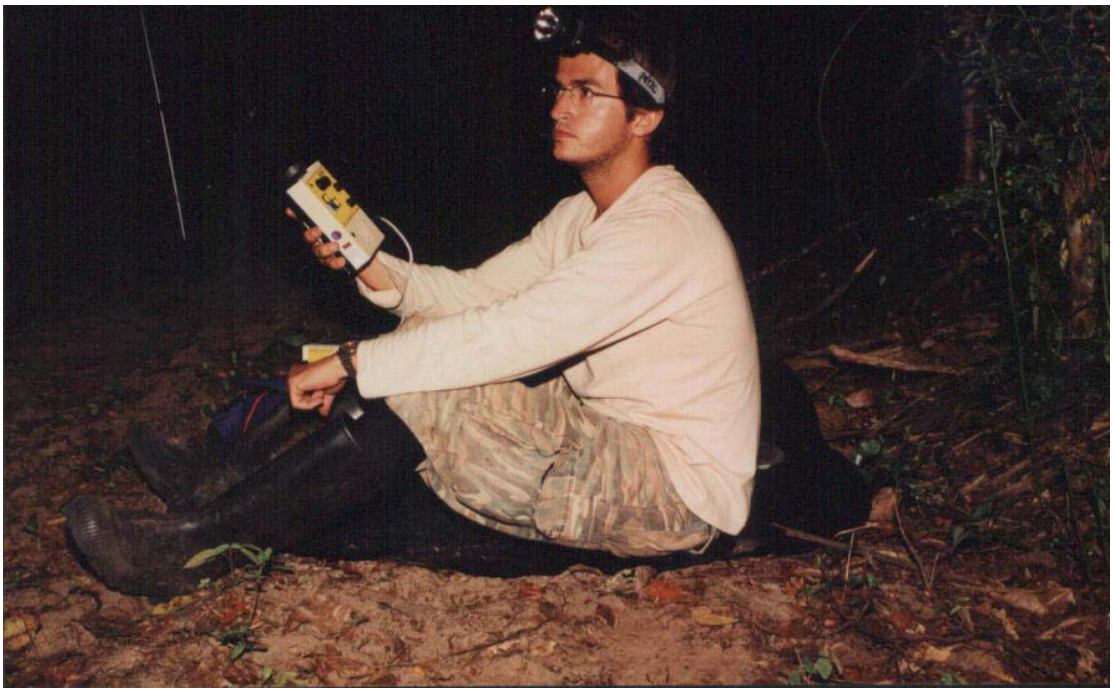


Figure 1 – The researcher Fábio Falcão using the Anabat equipment in the Boa Nova region.

Results

- Mist-nets and roost search

Our capture effort at Boa Nova region was 80 mist-net-hours (mnh) over 16 nights of sampling. We captured 26 bats representing 8 species, 7 genera, and 2 families (Table 1). Of these, 5 were captured in an abandoned house, near one of the forest fragments (*C. perspicillata*, n=2; *G. soricina*, n=3).

Table 1. Bats captured in the Boa Nova region, Bahia, Brazil. Distribution by families and subfamilies, classification into guilds, and mean weight. The nomenclature follows Koopman (1993). Ia[1]: aerial insectivores; Ig[2] .:gleaning insectivorous; F:. frugivorous; H: hematofagous; N: nectarivorous.

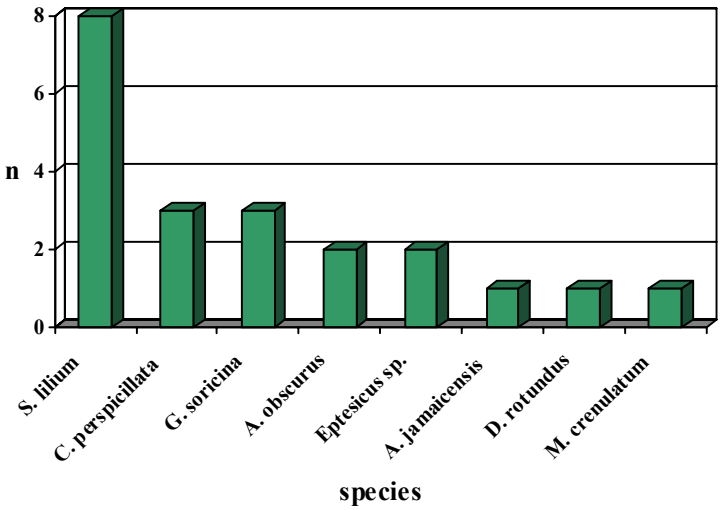
	Trophic guild	**Weight (g)**	**n**
PHYLLOSTOMIDAE			
Stenodermatinae			
Artibeus jamaicensis Leach	F	87,0	1
Artibeus obscurus (Schinz)	F	6,0 ± 5,7	2
Sturnirinae			
Sturnira lilium (E. Geoffroy)	F	19,0±0,0	8
Carollinae			
Carollia perspicillata (Linnaeus)	F	21,5 ± 6,4	5

Desmodontinae			
Desmodus rotundus (E. Geoffroy)	H	36,0	1
Glossophaginae			
Glossophaga soricina (Pallas)	N	10,5±2,1	6
Phyllostominae			
Mimon crenulatum (E. Geoffroy)	Ig	10,5	1
VESPERTILIONIDAE			
Eptesicus sp.	Ia	7,0	2
Total			**26**

[1] Hunting for insects while flying in open space.
[2] Hunting for insects over the foliage or on the ground.

Twenty-one individuals were captured using mist-nets, only at ground level (Figure 2). Nineteen of these belonged to the Phyllostomidae family (90,5%) and 2 to the Vespertilionidae family (9,5%).

Figure 2 - Numbers of captures (n) in mist-nets in the Boa Nova region



The frugivorous bats were the most represented, constituting 52,4% of individuals, nectarivorous constituted 28,6%, aerial insectivorous constituted 9,4% and gleaning insectivorous and hematofagous constituted 4,8% each. Within the Phyllostomidae family, the subfamily Stenodermatinae was the only that we found 2 species, and all the others (Carollinae, Desmodontinae, Glossophaginae and Phyllostominae) we found only one species.

- ANABAT sampling

Acoustic sampling was conducted during 13 nights. The files recorded using ANABAT were sent to a specialist and are still being analysed.

In our previous analysis, we could identify 4 species, distributed in 3 families. Within the Molossidae family, with found *Molossus molossus* and *Molossus ater*; within the Verpertilionidae, we found *Lasiurus ega*; and within Emballonuridae, *Saccopteryx bilineata*. We also found 5 morpho-species, and we are still analyzing them.

- Species account

Below we provide an account of these species, and, when available, we provide either original or reference to published biological information about them in the state. We followed Koopman (1993) as taxonomic reference of each species.

Order Chiroptera
Family Phyllostomidae
Subfamily Stenodermatinae

Sturnira lilium (É. Geoffroy, 1810)

Sturnira lilium is a widespread neotropical species, occurring in the Lesser Antilles, from Mexico south to Bolivia, Paraguay, north of Argentina, Uruguay, and eastern Brazil, Trinidad and Tobago, and Grenada (Koopman, 1993). Marinho-Filho and Sazima (1998) report this species for all Brazilian biomes. Faria (2002) report this species for southern Bahia, in fragments of Atlantic forest.

Artibeus jamaicensis Leach, 1821

Artibeus jamaicensis occurs from Mexico to Ecuador, Peru, Bolivia, northern Argentina, eastern Brazil, Trinidad and Tobago, Greater and Lesser Antilles, and south Bahamas (Koopman, 1993). Marinho-Filho and Sazima (1998) report this species for all Brazilian biomes. It has been recorded by Faria (2002) for southern Bahia, in fragments of Atlantic forest.

Artibeus obscurus (Schinz, 1821)

Artibeus obscurus (Figure 3) is a medium-sized species of *Artibeus*, occurring in Colombia, Venezuela, Guianas, Ecuador, Peru, Bolivia and Brazil. (Koopman, 1993). This species was reported by Faria (2002) and Santos (2001) for southern Bahia, in fragments of Atlantic forest and in a karstic region, respectively.

Figure 3 – *Artibeus obscurus*

Subfamily Carollinae

Carollia perspicillata (Linnaeus, 1758)

Carollia perspicillata (Figure 4) is known from Mexico to Peru, Bolivia, eastern Brazil, and Trinidad (Koopman, 1993). Marinho-Filho and Sazima (1998) report this species for all Brazilian biomes. This species was reported by Faria (2002) and Santos (2001) for southern Bahia, in fragments of Atlantic forest and in a karstic region, respectively.

Figure 4 – *Carollia perspicillata*

Subfamily Desmodontinae

Desmodus rotundus (É. Geoffroy, 1810)

Desmodus rotundus (Figure 5), the common vampire bat, occurs from Mexico to Brazil, Uruguay, northern Argentina, Paraguay, Bolivia, and northern Chile, Margarita Island in Venezuela, and Trinidad (Koopman, 1993). Marinho-Filho and Sazima (1998) report this species for all Brazilian biomes. Faria (2002) and Santos (2001) report this species for southern Bahia, in fragments of Atlantic forest and in a karstic region, respectively.

Large populations of *Desmodus rotundus* are a serious problem of public health in the state, because of the transmission of rabies, mainly to the cattle, and secondarily for sporadic reports of aggressive biting to people. Concerning feeding requirements, the historical establishment of cattle raising in the state in an extensive way, has historically beneficiated the species, which has in the cattle a source of easy food.

Figure 5 – The common vampire bat, *Desmodus rotundus*

Subfamily Glossophaginae

Glossophaga soricina (Pallas, 1766)

Glossophaga soricina (Figure 6) is a widely distributed glossophagine bat, ranging from Mexico to Guianas, Bolivia, Peru, southeastern Brazil, northern Argentina, and occurring in Margarita Island (Venezuela), Grenada, Jamaica (Koopman, 1993). Marinho-Filho and Sazima (1998) report this species for all Brazilian biomes. Faria (2002) and Santos (2001) report this species for southern Bahia, in fragments of Atlantic forest and in a karstic region, respectively.

Figure 7 – *Glossophaga soricina*

Subfamily Phyllostominae

Mimon crenulatum (E. Geoffroy, 1803)

Mimon crenulatum (Figura 8) is known from Mexico to Guianas, eastern Brazil, Bolivia, Ecuador, eastern Peru, and Trinidad (Koopman, 1993). Marinho-Filho and Sazima (1998) report this species for all Brazilian biomes, with the exception of pantanal.

Figura 8 – *Mimon crenulatum*

Family Vespertilionidae

Eptesicus sp. Rafinesque, 1820

The genus *Eptesicus* is widely spread in the world, and occurring 4 species in Brazil. The 2 individuals of this genus collected were preserved and we are still analyzing it to confirm the identification.

Figure 9 – *Eptesicus* sp.

Lasiurus ega (Gervais, 1856)

Lasiurus ega is known for south Texas, eastern and southern Mexico south to Bolivia, Trinidad, Argentina, Uruguay, and Brazil (Koopman, 1993). Marinho-Filho and Sazima (1998) report this species for all Brazilian biomes.

Family Molossidae

Molossus molossus (Pallas, 1766)

Molossus molossus is a small molossid bat, widely distributed in the neotropics, occurring in the Greater and Lesser Antilles, Florida Keys (USA), Curaçao and Bonaire, Trinidad and Tobago, from Mexico to Peru, Guianas, Brazil, northern Argentina, Margarita Island in Venezuela, and Uruguay (Koopman, 1993).

Molossus ater E. Geoffroy, 1805

M. ater is known from Tamaulipas and Sinaloa (Mexico) to Peru, North Argentina, Brazil and Trinidad (Koopman, 1993).

Family Emballonuridae

Saccopteryx bilineata

S. bilineata is known from Jalisco and Veracruz (Mexico) to Bolivia, Guianas, East Brazil to Rio de Janeiro, Trinidad and Tobago (Koopman, 1993). Faria (2002) and Santos (2001) report this species for southern Bahia, in fragments of Atlantic forest and in a karstic region, respectively.

DISCUSSION

The high number of phyllostomid bats captured in mist-nets was expected due to the fact that this is the most diversified Neotropical bat family, and due to the capture method used (Fenton *et al*. 1992).

Despite of the relative low number on individuals captured (n=26) and diversity found, when compared with other bat surveys in Brazil, there was a high diversity of trophic guilds (5) (Table 1). Five of the eight species captured were those that provide critical ecological services of seed dispersal, including pioneer plants, and pollination of tropical plants. The frugivorous species of the genus *Artibeus* feed mainly on fruits found most frequently at canopy level, such as *Ficus* species (Bonaccorso 1979). The short-tailed fruit-eating bats, *C. perspicillata* feed primarily on understorey plants such as *Piper, Solanum* and *Vismia* (Fleming 1988).

The number of species and morpho-species is relatively high, once this method increased the species account to 12 species (without the morpho-species), instead of 8 found with mist-nets and roost searches.

It´s expected that during future bat surveys in the rainy season, additional species will be documented for this region.

3.6 Medium and large sized terrestrial mammals

Leandro C. Baumgarten

Introduction

The tropical forests together houses close to half of total known species from the earth surface, and are being reduced at alarming taxes (Myer et al. 2000). Besides reduction and isolation, species are threatened by factors associated with fragmentation, such as fire, edge effects and predatory extractive activities. Within the most threatened faunal groups there are the medium and large sized terrestrial mammals. Several studies has shown that hunting activities, even when made by low density human populations could leads to decline and local disappearance of some animal species. (Redford e Robinson 1987, Ayres et al. 1991, Bodmer et al. 1994, Fitzgibbon et al 1995, Peres, 1996). Eventually, even large Forest patches apparently untouched could be empty due to hunting (Redford, 1992).

The disappearance or decline of the medium and large sized terrestrial mammal's populations could cause direct and indirect effects on other animals and plants (Soulé et al. 1988, Dirzo e Miranda 1990). Alterations in community structure of medium and large sized terrestrial mammals leads to change in seeds and seedlings predation, changing plant community structure (Dirzo e Miranda 1991). The alterations could compromise the entire Forest dynamics (Terborgh et al. 1999).

Within the most threatened forests is Atlantic Forest biome, specially the Brazilian northern remnants of this formation. Besides fragmentation and disturbance, most of the remaining 7% of Atlantic Forest is steel poorly studied. In a recently classification made by Ministério do Meio Ambiente (the Brazilian environmental agency), 147 priority areas for conservation were defined, and in several areas there are poorly information about the biota. This lack of knowledge is frequently one of the largest gaps to the establishment of a conservation strategy.

In this context, this report intends to expose the obtained information about medium and large sized terrestrial mammal communities of Boa Nova region as well as the developed activities until the present.

Methods

We sampled four fragments in the study area, tree in Poções County (João Guilherme, Beto, Leoncio) and one in Boa Nova (Boa Nova). We choose these areas based on conservation status, vegetation type and land owner permit.

We use two 200-meters transects in each fragment, with 11 sand plots (50x50 cm) set 20 meters apart. The plots had, at least, 3 cm depth and sand was mixed over and moistened, when necessary, to improve footprint marking.

We baited daily all plots with banana slices and revised for four days between November 29 and December 3 2003. The sampling effort was 352 plots/day.

We identified footprints species on site or took a picture when identification was uncertain. The pictures taken were placed in the Instituto Driades' database for further check.

Results

The Crab-eating fox, when recorded, use to visit most of the plots of a transect in one night to eat its baits. To prevent an overestimation of this species abundance, all the records for one fragment in one night were transformed in a single record.

We found six species for 39 records (Table 1), Crab-eating fox was most abundant (8 records) followed by Coati (5 records). We were unable to identify 3 footprints.

Considering all data we encountered an average of 0,11 records/plot/day (Table 2). This is one of the lowest estimates among all studies in Atlantic Forest, it is only higher then the average obtained for Conquista Plateau nearby (Conquista Plateau Project, unpublished report). Local richness seems low, but we should stress that small sampling effort was small until now. The number of records/plot/day is less then half encountered in Rebio UNA, which is the closest Atlantic Forest area.

Most of the species found are able to survive in very disturbed habitats (Eisenberg e Redford 2000). It is important to observe species like agoutis, pacas and deers. During sampling we use to see local dwellers carrying shot-guns unconcerned. It seems sustenance hunting is usual in the area and this factor combined with disturbance level of the fragments can explain low abundance and richness found.

There is high heterogeneity in mammal species composition between areas. Among four sampled fragments, Boa Nova had more records (9), while Leôncio had only one (Table 3). Highest richness found was four species (João Guilherme)

The amount of data collected until now, does not allow further data analysis to characterize areas according species composition yet.

Discussion e Further Activities

Preliminary data indicate that large and medium sized mammals in Boa Nova and Poções forest fragments are scarce. Richness found in this study was one the lowest found for Atlantic Forest and even species found occur in low abundance.

Data above suggests hunting is a major factor influencing mammal species composition in the region. Although, fragmentation process, its secondary effects, and other antropic factors must contribute to actual situation. We find significant finding records of Yellow-breasted Capuchin, an endangered species (IUCN) showing this region potential for biodiversity maintenance.

Table 1. Species and unidentified records.

Species	Common Name	Abundance
Didelphis sp	Large American Opossum	2
Dasypus sp	Long-nosed Armadillo	2
Cerdocyon thous	Crab-eating Fox	8
Nasua nasua	Coati	5
Cebus xanthosternusr	Yellow-breated Capuchin	2
Unindentified		3
Total		72

In 2004 we will conduct at least two more field trips to collect data for this inventory. The information obtained will allow a more detailed fragment characterization and detect temporal variation in species composition.

Table 2. Records/plot/day from other studies with similar methodologies in Brazil (Pardini 2002, Pardini et al. 2003, unpublished report).

Site	Habitat	Richness	Records/plot/day
Morro do Diabo (SP)	Atlantic Forest	13	1,194
Fazenda Tucano (SP)	Atlantic Forest	7	0,898
Fazenda Mosquito (SP)	Atlantic Forest	13	0,302
Fazenda Bacuri (SP)	Cerrado	9	0,334
Fazenda São Domingos (GO)	Cerrado	3	0,034
Fazenda 13 Pontos (GO)	Cerrado	13	0,204
Fazenda Morro Vermelho (GO)	Cerrado	11	0,156
Parque Nacional das Emas (GO)	Cerrado	12	0,400
REBIO Uma (BA)	Atlantic Forest	10	0,265
Planalto da Conquista	Atlantic Forest	5	0,111

Table 3. Records of species in each fragment.

	Species						
Site	*Cerdocyon thous*	*Nasua nasua*	*Dasypus* sp	*Didelphis* sp	*Cebus xanthosternos*	Unin.	Total
Beto	3	0	0	0	0	1	4
Boa Nova	5	3	0	0	1	0	9
João Guilherme	0	2	1	2	1	2	8
Leôncio	0	0	1	0	0	0	1

3.7 Birds

Luis Fabio Silveira

Birsd from Vitória da Conquista Plateau

The region of Vitória da Conquista Plateau is inserted between two important Brazilian Biomes, the Mata Atlântica and Caatinga. Its vegetational complexity, forming different habitats, houses a great number of bird species, several of them endemics to certain environments, or with a restrict distribution. Meanwhile, despite its importance, the ornithological knowledge of this region is steel inadequate and the few studies made about the region are basically restrict to Boa Nova region.

Besides biogeographical importance and the large species richness, because it is a contact between two distinct biomes, all the region of Vitória da Conquista Plateau presents a high degree of habitat disturbance, with few large remnants and well preserved. This study can identify potentially important areas from the birds' community point of view, and that can guarantee the regional conservation that contains so remarkably endemism.

Birds' communities were sampled using two different methods. In the first, the sampling points, the observer stays during five minutes in each point marked on each 100m in a 1000m transect opened in the chosen environment, and register all individuals that were observed or heard. Distance from the observer to the bird weren't estimate due to problems with distance estimative in tropical regions. This technique permits to evaluate the abundance of individuals on the community. The observations were initiated before sunrise and last until eight o'clock in the morning. After this period the observer is free to walk to all the points again, searching rare species, threatened species or to solve eventual identification problems the objective of this method of active search is to survey the bird richness in each surveyed environment.

In the second method, complementary to the first, were used ten mist nets of 12 meter long and 3 meters height, located sequentially in lines covering 120 meters. The nets were armed during 3 hours in the morning and tree hours in the afternoon, totaling 240 hours – nets in each fragment. This technique were used to complement the sampling point method, detecting species that pass unnoticed to the observer or do not sing during the point census.

Here we present the preliminary results of species richness from the studies of the four sites of the Boa Nova region.

Table 1. Birds' Species list from the four site studied in Boa Nova Region.

	FRAGMENTS	Beto		Leoncio		João Guilherme		Boa Nova	
		morning	afternoon	morning	afternoon	morning	afternoon	morning	afternoon
ORDER									
Family									
Specie	**Name**								
ORDER TINAMIFORMES									
Family Tinamidae									
Crypturellus parvirostris	Small-billed Tinamou	X				X			X
Crypturellus tataupa	Tataupa Tinamou	X	X	X		X	X	X	
ORDER FALCONIFORMES									
Family Cathartidae									
Sarcoramphus papa	King Vulture								
Coragyps atratus	Black Vulture			X		X	X	X	
Cathartes aura	Turkey Vulture						X		
Cathartes burrovianus	Lesser Yellow-headed Vulture				X				
Family Accipitridae									
Leptodon cayanensis	Gray-headed Kite					X			
Ictinia plúmbea	Plumbeous Kite	X				X			
Buteo albicaudatus	White-tailed Hawk								
Rupornis magnirostris	Roadside Hawk		X	X			X	X	
Geranospiza caerulescens	Crane Hawk	X							

Family Falconidae											
Herpetotheres cachinnans	Laughing Falcon								X		
Micrastur ruficollis	Barred Forest-Falcon					X				X	
Milvago chimachima	Yellow-headed Caracara	X		X			X				
Caracara plancus	Crested Caracara		X								
Falco sparverius	American Kestrel	X									
ORDER CHARADRIIFORMES											
Family Charadriidae											
Vanellus chilensis	Southern Lapwing						X				
ORDER COLUMBIFORMES											
Family Columbidae											
Scardafella squammata	Scaled Dove		X								
Leptotila verreauxi	White-tipped Dove	X				X			X		
Leptotila rufaxilla	Grey-fronted Dove			X							
ORDER PSITTACIFORMES											
Family Psittacidae											
Primolius maracana	Blue-winged Macaw					X			X		
Aratinga auricapilla	Golden-capped Parakeet										
Aratinga cactorum	Cactus Parakeet		X		X					X	
Pyrrhura cruentata	Ochre-marked Parakeet					X					
Pyrrhura frontalis	Reddish-bellied Parakeet			X		X					
Forpus xanthopterygius	Blue-winged Parrotlet	X		X			X				
ORDER CUCULIFORMES											
Family Cuculidae											
Piaya cayana	Squirrel Cuckoo	X			X	X			X		

Tapera naevia	Striped Cuckoo	X					X			
ORDER STRIGIFORMES										
Family Strigidae										
Otus choliba	Tropical Screech-Owl	X				X				
Pulsatrix koeniswaldiana	Tawny-browed Owl				X	X				
Athene cunicularia	Burrowing Owl									X
ORDER CAPRIMULGIFORMES										
Family Caprimulgidae										
Lurocalis semitorquatus	Short-tailed Nighthawk				X	X		X		
Nyctiphrinus ocellatus	Ocellated Poorwill		X	X						
Nyctidromus albicollis	Pauraque	X		X		X				
Hydropsalis torquata	Scissor-tailed Nightjar		X	X						
ORDER APODIFORMES										
Family Apodidae										
Chaetura meridionalis	Ashy-tailed Swift						X			
Chaetura cinereiventris	Grey-rumped Swift	X								
Family Trochilidae										
Phaethornis pretrei	Planalto Hermit	X		X						
Campylopterus macrourus	Swallow-tailed Hummingbird					X				
Discosura sp.	Coquette					X				
Chlorostilbon aureoventris	Glittering-bellied Emerald					X				
Thalurania glaucopis	Violet-capped Woodnymph			X		X				

Polyerata lactea	Sapphire-spangled Emerald					X		X	
Heliomaster longirostris	Long-billed Starthroat	X				X			
ORDER PICIFORMES									
Family Picidae									
Picumnus pygmaeus	Spotted Piculet			X		X		X	
Colaptes campestris	Campo Flicker		X						
Piculus chrysochloros	Golden-green Woodpecker								X
Melanerpes candidus	White Woodpecker	X							
Dryocopus lineatus	Lineated Woodpecker	X				X		X	
Veniliornis passerinus	Little Woodpecker		X	X		X			X
Campephilus robustus	Robust Woodpecker				X				
ORDER PASSERIFORMES									
SUBORDER Suboscines									
Family Thamnophilidae									
Taraba major	Great Antshrike	X	X			X		X	
Sakesphorus cristatus	Silvery-cheeked Antshrike	X	X				X		X
Thamnophilus pelzelni	Eastern Slaty Antshrike	X	X		X	X	X	X	X
Dysithamnus mentalis	Plain Antvireo					X		X	
Myrmorchilus strigilatus	Stripe-backed Antbird	X	X	X		X		X	X
Herpsilochmus atricapillus	Black-capped Antwren			X	X	X	X	X	
Herpsilochmus sellowi	Caatinga Antwren	X	X						X
Formicivora grisea	White-fringed Antwren	X						X	
Formicivora iheringi	Narrow-billed Antwren	X	X		X	X		X	X
Pyriglena leucoptera	White-shouldered Fire-eye	X	X	X		X	X	X	X

Rhopornis ardesiaca	Slender Antbird	X	X			X	X	X	
Myrmeciza loricata	White-bibbed Antbird				X	X			
Family Formicariidae									
Chamaeza campanisona	Short-tailed Antthrush			X	X	X			
Hylopezus ochroleucus	White-browed Antpitta	X	X	X		X			X
Family Conopophagidae									
Conopophaga lineata	Rufous Gnateater	X			X	X			
Family Furnariidae									
Furnarius rufus	Rufous Hornero	X							X
Furnarius leucopus	Pale-legged Hornero	X						X	
Synallaxis cinerea	Bahia Spinetail				X	X			
Synallaxis frontalis	Sooty-fronted Spinetail	X		X		X		X	
Synallaxis albescens	Pale-breasted Spinetail		X						
Poecilurus scutatus	Ochre-cheeked Spinetail	X	X			X		X	
Cranioleuca pallida	Pallid Spinetail			X	X				
Phacellodomus rufifrons	Rufous-fronted Thornbird	X					X		
Sclerurus scansor	Rufous-breasted Leaftosser					X	X		
Family Dendrocolaptidae									
Sittasomus griseicapillus	Olivaceous Woodcreeper			X		X	X	X	
Xiphocolaptes albicollis	White-throated Woodcreeper				X	X			
Dendrocolaptes platyrostris	Planalto Woodcreeper			X			X		
Xiphorhynchus fuscus	Fuscous Woodcreeper			X		X			
Lepidocolaptes	Narrow-billed	X							

angustirostris	Woodcreeper								
Campylorhamphus falcularius	Black-billed Scythebill	X				X			
Family Tyrannidae									
Phyllomyias fasciatus	Planalto Tyrannulet	X	X	X		X			
Camptostoma obsoletum	Southern Beardless Tyrannulet		X		X		X	X	
Phaeomyias murina	Mouse-coloured Tyrannulet	X		X		X			X
Elaenia flavogaster	Yellow-bellied Elaenia					X			X
Elaenia spectabilis	Large Elaenia						X		
Serpophaga subcristata	White-crested Tyrannulet	X				X			
Euscarthmus meloryphus	Tawny-crowned Pygmy-Tyrant	X							
Hemitriccus nidipendulus	Hangnest Tody-Tyrant	X		X		X	X	X	X
Hemitriccus margaritaceiventer	Pearly-vented Tody-tyrant				X		X		
Tolmomyias sulphurescens	Yellow-olive Flycatcher	X	X			X	X	X	X
Tolmomyias flaviventris	Yellow-breasted Flycatcher		X			X			
Platyrinchus mystaceus	White-throated Spadebill			X		X		X	
Myiophobus fasciatus	Bran-coloured Flycatcher	X		X		X			
Lathrotriccus euleri	Euler's Flycatcher			X		X		X	X
Cnemotriccus fuscatus	Fuscous Flycatcher						X		
Corithopis delalandi	Southern Antpipit					X			
Colonia colonus	Long-tailed Tyrant					X			
Casiornis fusca	Ash-throated Casiornis	X							
Myiarchus tyrannulus	Brown-crested Flycatcher	X	X	X	X	X		X	X
Satrapa icterophrys	Yellow-browed Tyrant								

Myiodinastes maculatus	Variegated Flycatcher	X	X	X		X	X	X	X
Megarhynchus pitangua	Boat-billed Flycatcher	X							
Family Pipridae									
Chiroxiphia caudata	Swallow-tailed Manakin				X				
Neopelma pallescens	Pale-bellied Tyrant-Manakin	X				X			
Schiffornis virescens	Greenish Manakin	X					X		
ORDER PASSERIFORMES									
SubORDER Oscines									
Family Hirundinidae									
Phaeoprogne tapera	Brown-chested Martin				X		X		
Notiochelidon cyanoleuca	Blue-and-white Swallow	X		X		X		X	
Family Troglodytidae									
Thryothorus genibarbis	Moustached Wren					X		X	
Troglodytes musculus	House Wren			X			X	X	
Family Muscicapidae									
SUBFAMILY Sylviinae									
Polioptila plumbea	Tropical Gnatcatcher	X	X		X		X	X	
SUBFAMILY Turdinae									
Turdus rufiventris	Rufous-bellied Thrush	X		X			X	X	X
Turdus leucomelas	Pale-breasted Thrush		X		X	X		X	
Family Mimidae									

Mimus saturninus	Chalk-browed Mockingbird		X						
Family Vireonidae									
Cyclarhis gujanensis	Rufous-browed Peppershrike	X		X	X	X		X	X
Vireo olivaceus	Red-eyed Vireo	X	X	X		X	X		
Hylophilus amaurocephalus	Grey-eyed Greenlet	X	X	X	X	X	X	X	X
Family Emberizidae									
SUBFAMILY Parulinae									
Parula pitiayumi	Tropical Parula		X	X		X	X	X	X
Basileuterus flaveolus	Flavescent Warbler	X			X	X	X	X	X
Basileuterus culicivorus	Golden-crowned Warbler			X		X	X		
SUBFAMILY Coerebinae									
Coereba flaveola	Bananaquit	X						X	
SUBFAMILY Thraupinae									
Compsothraupis loricata	Scarlet-throated Tanager	X							
Hemithraupis ruficapilla	Rufous-headed Tanager					X			
Nemosia pileata	Hooded Tanager							X	
Tachyphonus rufus	White-lined Tanager	X							
Trichothraupis melanops	Black-goggled Tanager	X				X			X
Thraupis sayaca	Sayaca Tanager			X		X		X	
Euphonia chlorotica	Purple-throated Euphonia						X	X	
Tangara cayana	Burnished-buff Tanager	X				X	X	X	X
Dacnis cayana	Blue Dacnis					X		X	X

SUBFAMILY Emberizinae									
Zonotrichia capensis	Rufous-collared Sparrow	X							
Coryphospingus pileatus	Grey Pileated-Finch							X	X
SUBFAMILY Cardinalinae									
Caryothraustes canadensis	Yellow-green Grosbeak		X			X			
Saltator similis	Green-winged Saltator			X			X	X	
SUBFAMILY Icterinae									
Gnorimopsar chopi	Chopi Blackbird							X	