



The Dry Forest of the Madidi Region: Richness and Floristic Affinities



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Introduction

The dry forests found in the Madidi Region form an island between the more humid Amazonian and Andean forest that surround it, and it is considered the largest and best conserved relict in the Neotropics. The forests cover an area of 1,418 km² of which approximately 700 km² are in an almost pristine state¹.

From 2003 to 2005, we have carried out a 8 expeditions to the dry forest with the objective of gathering information to gain a better understanding of richness and affinities of the vegetation with its neighboring vegetation types.

Methods

We visited 11 localities, many quite remote and of difficult access, in relatively pristine state of conservation. All plots here analyzed were 0.1 ha (20 × 50 m transect) and non-permanent where all stems DBH≥2.5 cm were inventoried, so called modified Gentry plots. We also did general collecting and permanent 1 ha plots at the same localities.

Results

We collected 4,700 specimens; including 24 new records for the Madidi Región e.g., *Kielmeyera paniculada* (Clusiaceae), *Luetzelburgia praecox* (Fabaceae), *Banara tomentosa* and *Xylosma velutina* (Flacourtiaceae), and 10 new species e.g. *Passiflora* (1), *Cereus* (2), *Yungasocerus* (3) and *Bauhinia* all are currently in the process of being formally described. While our novelties of *Amyris*, *Chrysophyllum* (4) and *Justicia* are awaiting further collections of more and better material.

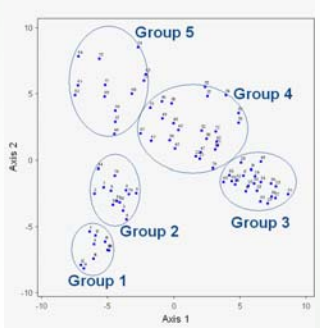


Inventory	Nº	Area (ha)	Nº individuals	Nº families	Average families/inventory	Nº species	Average species/inventory
Plots (0,1 ha)	82	8.2	25515	77	23	427	43
General collections	—	—	2478	105	—	1813	—

The dry forest share borders with humid Andean and Amazonian forests at the highest and lowest elevations respectively, as a consequence some species are shared among the formations.

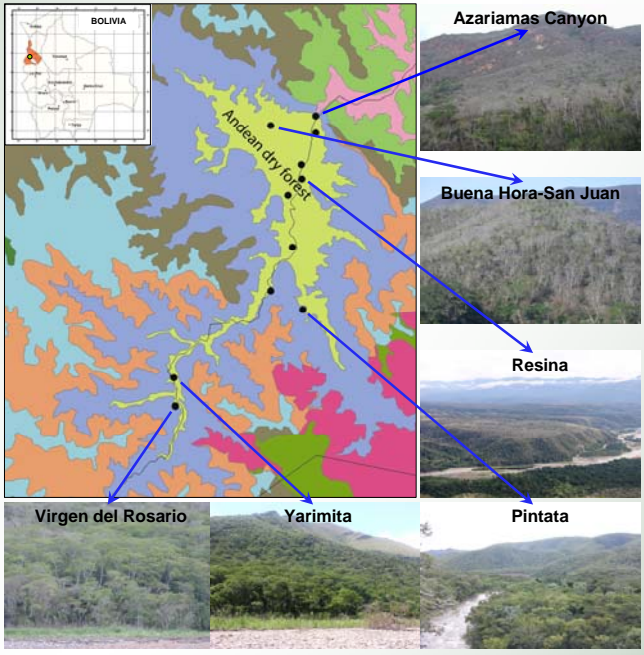
Our PCA analysis of the composition of the 82 established plots indicate three relatively well defined groupings (1–3) and two groups that are a little more disperse and may integrate (4–5). Axis one we see primarily as a dryness axis while axis two is more difficult to interpret it may combine richness and elevation.

Analyzing species richness of the five groups at 2800 collections with 1000 repetitions using rarefaction; show that the average species richness varies within the groups established by the PCA.



Group 1	Yarimita
Group 2	Yarimita and Virgen del Rosario
Group 3	Resina
Group 4	Azariamas Canyon, Buena Hora-San Juan and Pintata
Group 5	Pintata, Buena Hora-San Juan and Azariamas Canyon

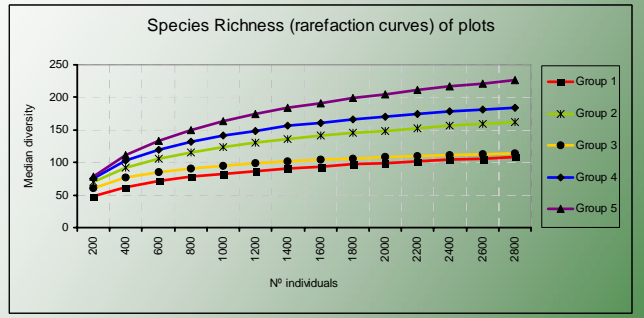
PCA analysis of the plots installed in the dry forest of the Madidi Region



Map showing the location of the 11 study sites each with 5–20 0.1 ha plots.

Group 1 is composed of plots with affinity to Andean semi-deciduous forest from the S limit of the dry forest; this grouping has the lowest species richness. Group 2 is composed of plots with a NE orientation, these slopes are dryer and have a tendency to form dry forest with Cerrado elements, none the less it has more species than group 1. The plots that constitutes Group 3, has an abundance of species from the Cactaceae, compared to the other groups. The plots in this grouping are located geographically in the center of the dry forests in the area that suffers the most prolonged dry season.

The rest of the plots form two larger groups in the PCA and as such area less well defined and not clearly separated from each other. Group 4 contain forest plots closer to humid Andean forest types, while Group 5 primarily contain the plots with an affinity to the Amazonian forests below. As the Amazonian and Andean forest form a transition surrounding the dry forest it is not surprising that the groups are difficult to defines and maintain separate. These two groups show the highest levels of species richness.



Conclusions

The dry forest vegetation can be separated in five groups by composition.

There are two natural formations, group 3, located at the geographical midpoint at the lowest possible elevation, and group 1, located on the northeast facing slopes.

The groups 2, 4, and 5 are different in their mixture from these but show affinity to other surrounding vegetation types.

Literature cited

1 Kessler, M. & N. Helme. 1999. Floristic diversity and phytogeography of the central Tuichi valley, an isolated dry forest locality in the Bolivian Andes. *Candollea* 54:341–366.