

Andean Vegetation Types of the Madidi region



MISSOURI
BOTANICAL
GARDEN

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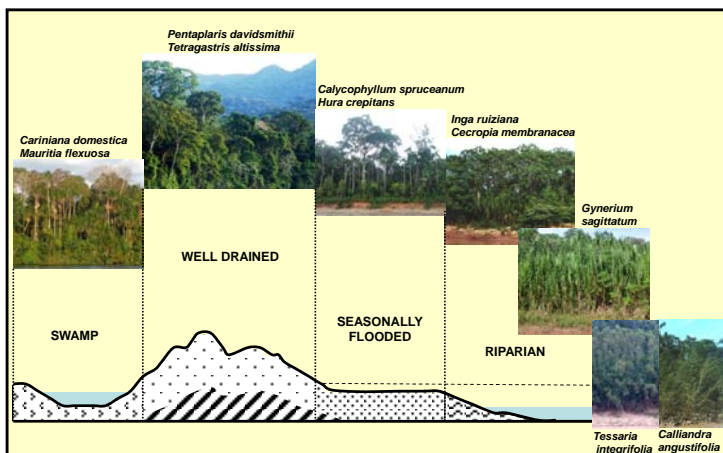
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Introduction

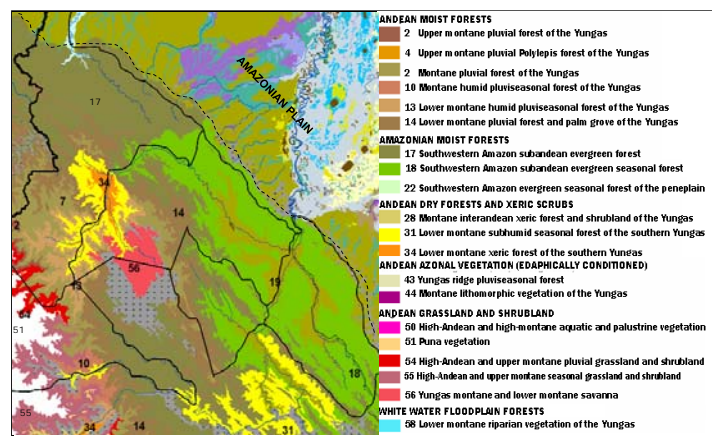
Detailed classification, cartography of the vegetation types, and a better understanding of their determining ecological factors are of key importance for landscape planning, conservation, and management of the natural resources. To detailed biodiversity inventories they are an important tool in selecting and obtaining a random or even distribution of the localities to be evaluated. This is particularly important in neotropical protected areas where confrontations between conservation and use are frequent.

The present study is part of a doctoral thesis study which main objective is to classify the Andean forest vegetation in the Madidi region. Given the impressive environmental heterogeneity present in this area, an equally impressive diversity of types of vegetation exists, with at least 50 ecological systems can be identified¹.

The final products of this study will include detailed descriptions of the forests types, combining floristic composition with their environmental factors (elevation, bioclimate, soils, and geomorphology), a detailed



Idealized scheme of the vegetation types ordination in the lowland preandean area of the Madidi Region. Here the primary ecological features that determines the vegetation are the flood and drainage.



Map of the ecological systems in the Andean area in the Madidi region.

Source ¹.

cartography of the vegetation types, and keys to differentiate the vegetation types.

The vegetation series are named after two characteristic and conspicuous species: the first is a restricted species that reaches its optimal in the vegetation type (usually an endemic) and the second a dominant species (often a more widespread).

Methods

For the differentiation of vegetation types we first use a model of bioclimatic classification², which was also used in the vegetation classification of Bolivia³, and at the moment it is used in the classification of ecological systems of Latin America⁴. Additionally we follow the concept of dynamic changes in geobotany^{2,3} within a biogeographic system for South America⁵. The differentiated types correspond in most cases to vegetation series that include a group of succession stages and the mature stage or climax, which are tied sequentially.

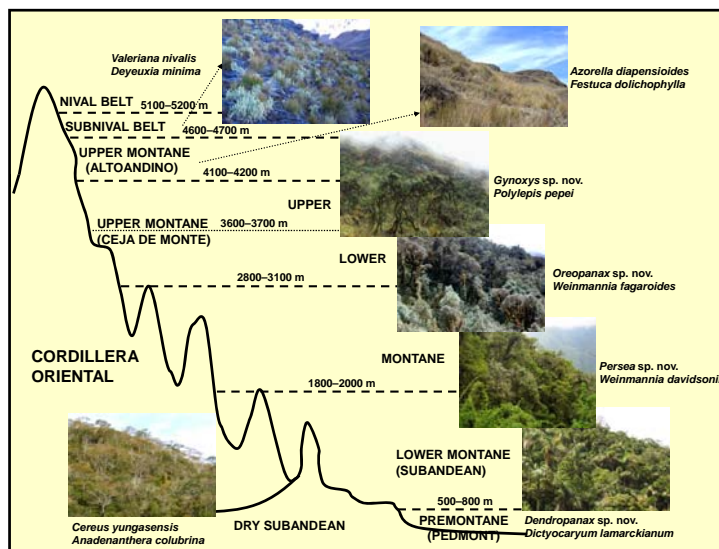
Cartographically these units correspond in many cases to the ecological systems identified for the Amazon basin of Peru and Bolivia¹ (see map). For the floristic characterization we made a selection of 0.1 ha plots evaluated for the Madidi Project. Additionally we have made 80 phytosociological inventories in forest types not covered by the plots.

Results

In our study area the vegetation types are tied to three biogeographic regions: Amazonian, Andean, and Brazilian-Paranean. The Amazonian vegetation form part of the Southwestern Amazonia or the Acre-Madre de Dios

province, which is shared with Brazil and Peru. The Andean vegetation is part of the biogeographic provinces of the Peruvian Puna and Peruvian-Bolivian Yungas in the central Andes, with a larger extension in Peru. The isolated areas of dry vegetation (both dry forests and cerrados) are related to the dry forests of the Pleistocene arch, representing a relic of the Brazilian-Paranean vegetation that has become isolated by past climatic fluctuations.

So far we have identified 53 vegetation types in the Andean area of the Madidi region (vegetation series and communities)⁶, of these 17 belong to the Amazonian region, 38 to the Andean region and one to the Brazilian-Paranean region. A total of 26 are restricted or endemic to our study area. The Andean vegetation forest covers an elevational range of 300 to 4200 m.



Idealized scheme of the andean mountain vegetation distribution. In this case the principal conditioning factors are bioclimate and elevation.

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