CONNECTING INDIGENOUS AND SCIENTIFIC ECOLOGICAL KNOWLEDGE in the MADIDI NATIONAL PARK (Bolivia)

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UAM UNIVERSIDAD AUTONOMA DE MADRID

Departamento de Biología
Área de Botánica
*julia.gonzalezdealedo@uam.es

Julia G. de Aledo*, Frans Bongers , Luis Cayuela and Manuel J. Macía

INTRODUCTION

Amazon basin
- Maximum biocultural diversity
- Interaction between natural environment and human long-settled populations
- Indigenous communities developed numerous strategies to use the natural resources

Ethno botany → Aims to understand the humans use plant resources in their natural environments

Objective → Apply ecological theories to the Traditional Ecological Knowledge

STUDY SITE

Madidi National Park, Bolivia

Gradient: high Andes to rainforests

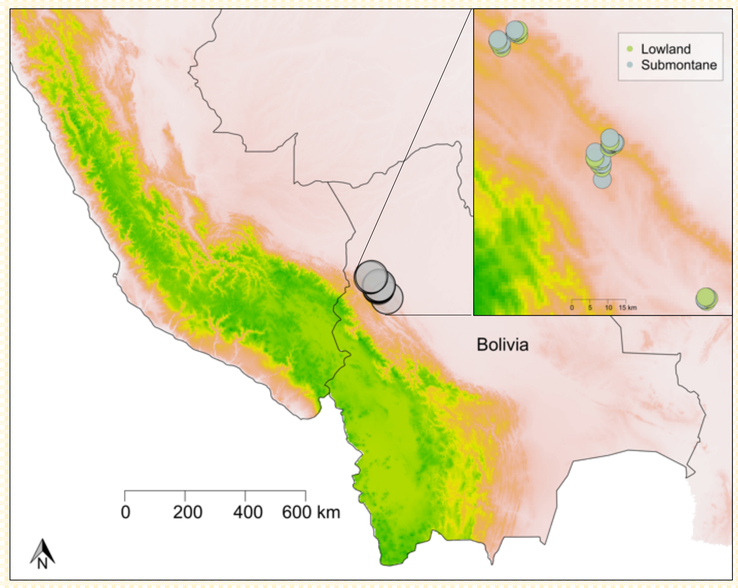
Trees, palms, lianas, hemiepiphytes DBH> 2.5

41 plots - 0,1 ha (50x20m) in 5 regions

Tacana ethnic group - 5.000 people

Informants: Seven males > 40 years old

Semi-structured interviews



RESEARCH QUESTIONS

1 What is the relationship between the use value of the species and its ecological importance?

The Ecologic Apparency Hypothesis (EAH) - Does plant **apparency** imply cultural importance? The more apparent species are the most used due to its higher chances to be found and experimented.

2 How are the cultural and floristic diversities related?

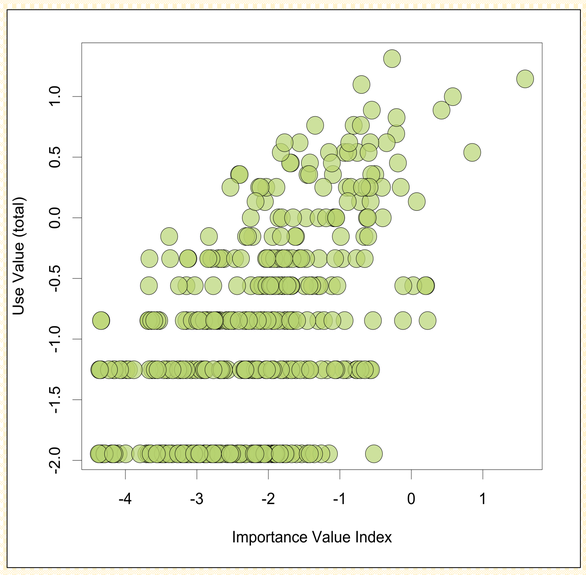
The presence of different species might enable humans to maximize the number of plants which they can draw for their livelihoods, being **biodiversity** the major ecological variable explaining plant usefulness.

METHODOLOGY

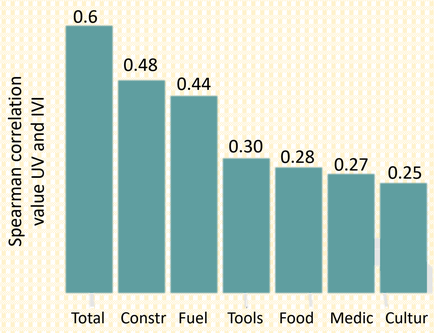
Importance Value Index (IVI) as an indicator of the species apparency. The Use Value Index (UV) of each species identifies which are the most important species to the population. Both were log transformed and analyzed by means of Spearman rank correlation.

Fisher's alpha index was used as a proxy of biodiversity. To assess forest cultural importance, the Use Value Index of a plot (UVp) was used. Relationship was analyzed with generalized linear modelling (GLM) with a Gaussian error distribution

RESULTS AND DISCUSSION



Differential support of the EAH: Cultural & Medicinal - weaker relation



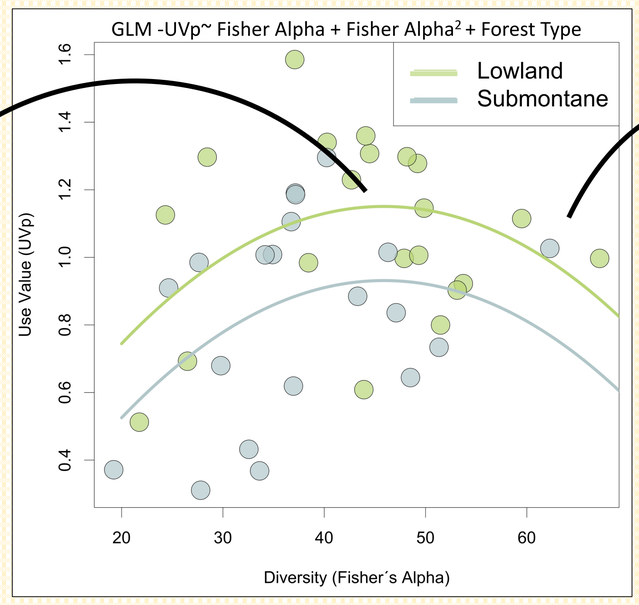
Higher the ecological importance of a species, the higher their use values. However, the Tacana people act as generalists or specialists depending on the final use of the resource (Optimal Foraging Theory - OFT):

Construction & Fuel

The selection is driven by the availability of the species (rather than quality).
Plants are more easily substitutable in terms of their physical qualities.

Cultural & Medicinal

The quality of the resource outweighs availability, becoming a limiting factor to the human choice.
Plants need to accomplish certain intrinsic requirements to be destined to this specific use.



Equilibrium: species with a high use + great number of useful species

Development of more rare species with no use

The usefulness of a forest increases with diversity, then it reaches an optimum where high plant variation of structures, chemical compositions and lifespan, enables usefulness to be maximized. Then, usefulness decreases as diversity increases because the abundance of the most useful species is compromised by the development of rare species.

CONCLUSION

Tacana people use plant resources that are more available, under premises of the EAH but shaped by the OFT by categories.

In the Madidi National Park, the usefulness is greatest at intermediate levels of diversity.

This study highlights the human capacity to adapt to specific environmental conditions, based on the availability or biodiversity of the plant resources. The reliance of local people on rainforest has often been cited as one reason for conservation of these forests. We suggest future research to explore the indigenous reality in depth in order to develop consistent conservation strategies that reinforce the ethnic identity and reduce environmental damage.

"Any observed patterns should therefore not be interpreted as a passive response to what nature has to offer us, but as the result of a dynamic interplay between people and their natural surroundings (Byg et al., 2006)