

Introduction

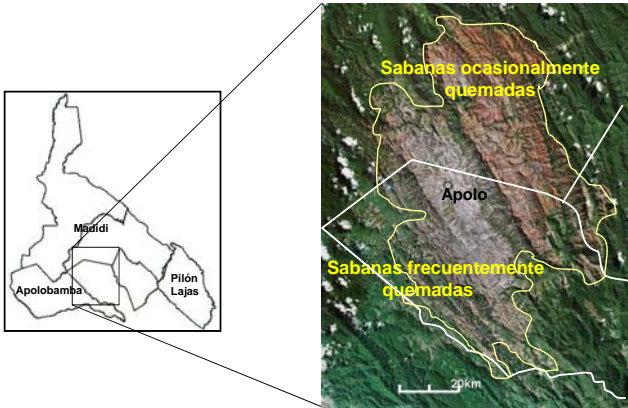
The montane savannas in Bolivia are distributed like islands in the more humid montane forest, known as Yungas, between 1000 and 2500 m elevation. The savannas in the Madidi Region covers approximately 545 km² near the town of Apolo¹.

These savannas are poorly known and almost unstudied. Their current use and management suggest that they are man made, but they have been associated with the Cerrado vegetation of Brazil², however, their composition and phytogeographical affiliation with other Neotropical savannas remain unclear



Methods

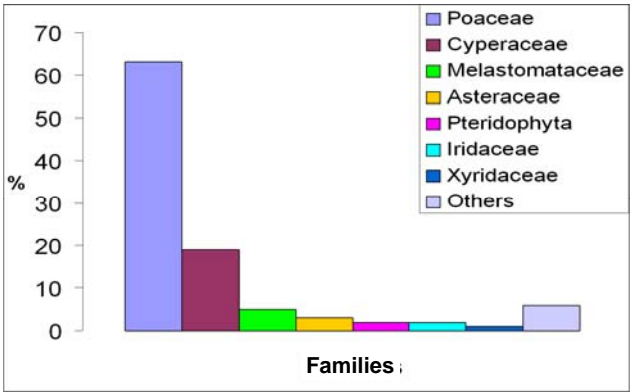
We used the line intercept method³, and sampled 70 lines each 10 m long. We collected extensively in the surrounding areas to establish a reference collection used to identify the vouchers from the intercept lines. The inventoried area is located in the northern half where burning is less frequent than in the southern half. We performed a phytogeographical analysis of all species found.



The location of the montane savannas of the Madidi Region.

Results

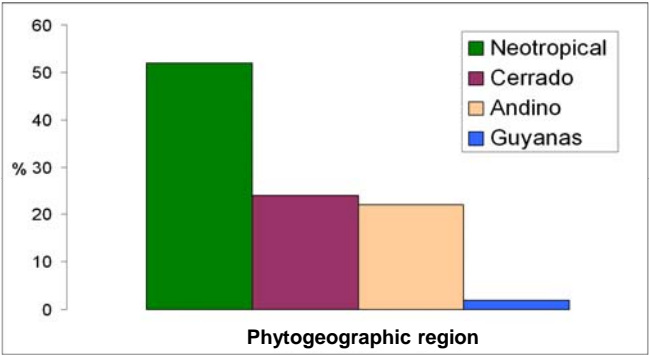
We found 120 species belonging to 31 families and 78 genera. The most abundant families were Poaceae, Cyperaceae and Melastomataceae (fig. 2). The most abundant species were *Axonopus siccus*, *A. caulescens*, and *A. canescens* (Poaceae).



The most abundant families in the montane savannas.

The savannas at Apolo follow the general tendency of neotropical savannas of having a large proportion of species with wide distribution as e.g. *Leptocoryphium lanatum* and *Bulbostylis paradoxa*, but we also find species that are associated with the

Cerrado as for instance *Chrysolaena herbacea* and *Microlizia arenariaefolia*. Noteworthy is also the typical Andean and endemic elements as *Hemipogon andinum* and *Cuphea nivea* plus elements from the Guyanas like *Axonopus caulescens* and *Axonopus flabelliformis*⁴.

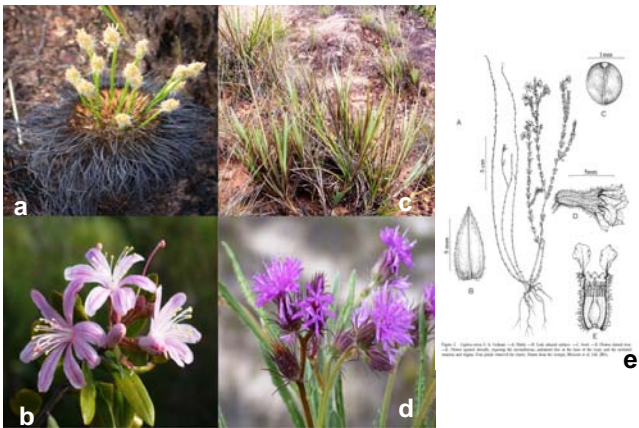


Composition of the phytogeographical elements of the montane savannas.

Conclusions

The montane savannas of the Madidi Region show affinity with other neotropical savannas such as the Cerrado of Brazil and the savannas in the Guyana area, but differs by their diversity of Asteraceae, a family particularly diverse in the Andes, and other Andean and endemic elements. This suggest the presence of naturally occurring savannas in small isolated patches long before human practices of frequent burning extended the savannas to their current coverage. The affinity to the Cerrado is surprisingly strong considering that these savannas are embedded in the Andes.

The dominance of the fire adapted species like *Bulbostylis paradoxa* is indicative of the frequent burns set by the inhabitant to maintain the pasture fresh and palatable for the cattle. Today the extent and composition of the savannas is largely decided by the management scheme of the local inhabitant and the savannas can be characterized as anthropogenic. However, endemic elements are present and if capable of surviving fires may have benefited and become more common, while others may have become increasingly rare.



Characteristic species of the montane savannas in the Madidi Region: a. *Bulbostylis paradoxa*, b. *Bejaria aestuans* c. *Axonopus siccus*, d. *Chrysolaena herbacea* e. *Cuphea nivea*.

Literature cited

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- 3 Canfield, R. 1941. Application of the line-intercept method in sampling range vegetation. Forestry 39: 388-396.
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Acknowledgements

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