

POPULATION GENETICS AND REPRODUCTIVE BIOLOGY OF *Vriesea minarum* (BROMELIACEAE) AN ENDANGERED RUPICOLOUS, ENDEMIC TO THE IRON QUADRANGLE, SOUTHEASTERN BRAZIL

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Introduction

The Iron Quadrangle (IQ) region in southeastern Brazil is one of the most relevant centers of Bromeliaceae diversity in Minas Gerais, showing a high number of endemic and endangered taxa [1][2][3]. Despite their ecological importance and frequency in areas of rocky outcrops where many other plant species would have difficulty to grow, several bromeliad species are threatened by habitat loss derived from human activities. Studies to understand the patterns and processes distribution of these species are urgently needed in order to set goals for their conservation.

Vriesea minarum (Fig.) is an endemic rupicolous bromeliad species, with naturally fragmented populations, restricted to the Iron Quadrangle region, in Minas Gerais State, Brazil, which is suffering from habitat loss due to the growth of cities and mining activities [4]. Thus, understanding its population genetics and reproduction may contribute to the development of conservation actions.

Material and methods

We used 10 microsatellite loci [5] to study the genetics of 12 populations of *V. minarum* and the statistical analyses to compare and describe the variability were performed.

Additionally, we investigated the reproductive biology of one population inside the Rola Moça State Park (Minas Gerais state, Brazil).

Results and Discussion

Among the results, we find a low population structure ($F_{st} = 0.088$), high inbreeding coefficient ($G_{is} = 0.376$), and different values of genetic richness (mean = 2.566) and gene diversity (mean = 0.635) for all populations.

These may be the result of efficient pollinators and/or seed dispersal mechanisms, thus showing a high connectivity among populations.

We found in the study of reproductive biology, with field experiments and observations, that the species has flowers that last for two days and that it has a mixed pollination syndrome. It is primarily alogamous, but also has the capacity to be self-fertilized, with more seeds germinating (54%) in the outcrossing treatment.



Figure. Specimens of *Vriesea minarum* in habitat.

Conclusions

It is expected that data obtained serve as a basis for other studies with species from the ferruginous rocky fields, especially endemic species from the Iron Quadrangle, with the aim of biodiversity conservation in this highly threatened environment [6].

The populations from Gandarela, Serra da Calçada, and Morro do Tamanduá should be top priorities for conservation (in situ/ex situ) and also sources for seeds.

Additional field work is in progress to observe the potential nocturnal visitors, which we believe are bats and that could help to understand the relatively low structuring of the populations. However, we found some structuring related to mountain range positioning within distinct river basin (Velhas vs. Doce rivers), suggesting that the forested valleys of the Espinhaço range are barriers for migration / pollinators.

Acknowledgements

We thank CAPES, FAPESB, CNPq for financial support. The Rola Moça State Park (IEF-MG)

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