

Bryophytes distribution along an altitudinal gradient of native forest in Pico island (Azores): preliminary results of epiphytic genera

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CONTEXT

The evergreen forests of the Azores offer a great variety of habitats for bryophytes, owing to the diversity of microhabitats and available substrata, and to the hyper-humid conditions they provide. Bryophytes play a vital role in such ecosystems (Homem & Gabriel, 2009). The understanding of species rarity is important in ecological and conservation research.

OBJECTIVES

The main purposes of this study are:

- to sample and analyze an altitudinal gradient of native forest vegetation in Pico Island (from 10 m to 2200 m);
- to increase the knowledge of the terrestrial biodiversity of Azorean bryophytes;
- to highlight the fine scale distribution of rare taxa.

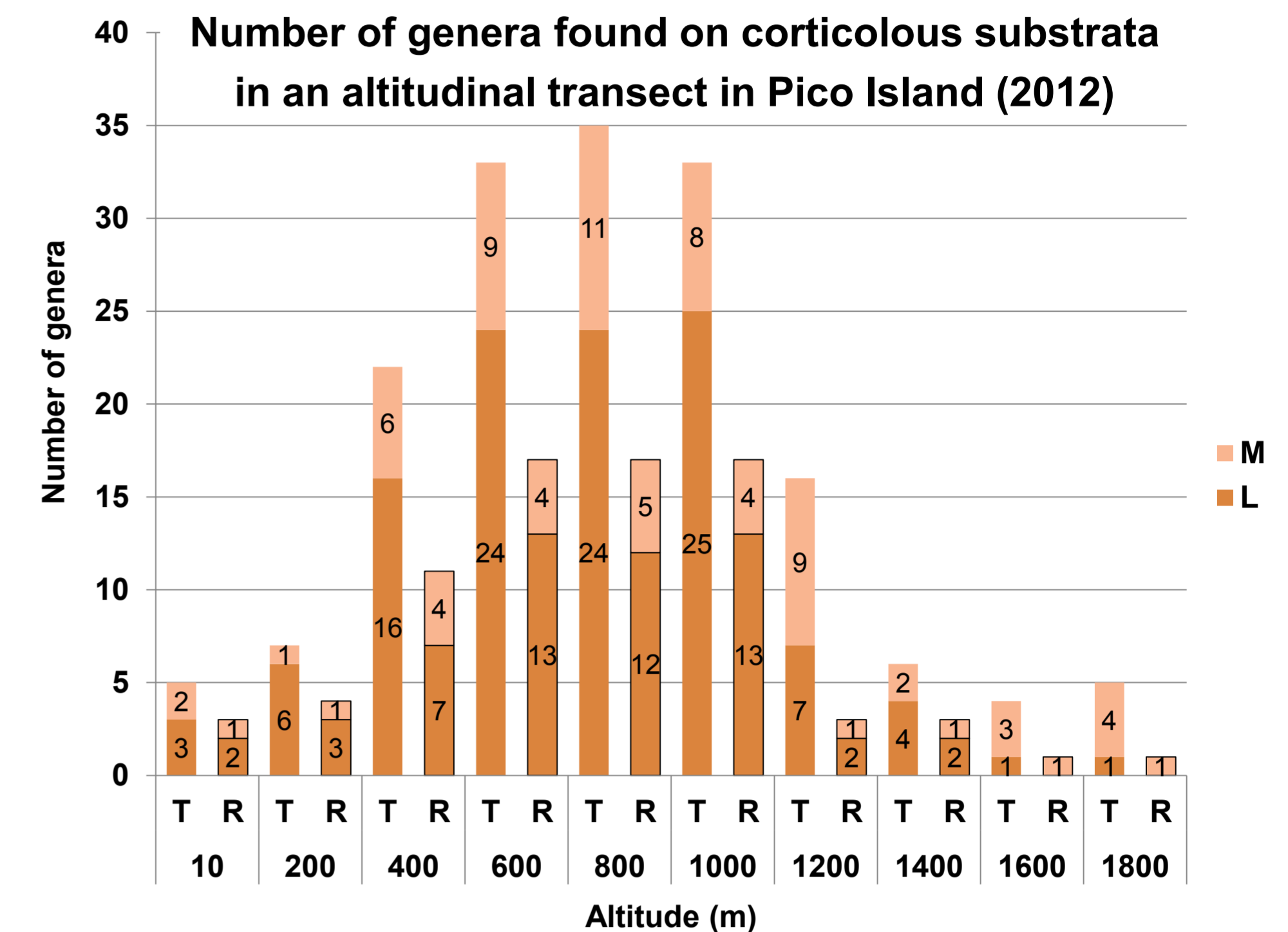


RESULTS

A total of 341 microplots of epiphytic bryophytes were sampled in 72 quadrats of the 24 plots coming from the 12 altitudinal stations. Fifty genera were recorded (25,13% of the known Azorean genera) along the altitudinal gradient, excluding 2000 m and 2200 m altitudes, where epiphytes weren't present (see figure). Twenty three out of the 50 screened genera, include rare or vulnerable species (see following table and figure).

GENERA / Conservation status of the species within genera		
LIVERWORTS		MOSSES
<i>Adelanthus</i>		<i>Andoa</i> R
<i>Aphanolejeunea</i>	V	<i>Cyclodictyon</i> R
<i>Bazzania</i>	R	<i>Dicranum</i>
<i>Calypogeia</i>	R	<i>Didymodon</i>
<i>Cephalozia</i>	V	<i>Fissidens</i> R
<i>Cephaloziella</i>	R	<i>Hylocomium</i>
<i>Cheilolejeunea</i>	V	<i>Hypnum</i> RT
<i>Cololejeunea</i>	R	<i>Isoetecium</i>
<i>Colura</i>	RT	<i>Leucobryum</i>
<i>Diplophyllum</i>		<i>Myurium</i>
<i>Drepanolejeunea</i>		<i>Polytrichum</i>
<i>Frullania</i>		<i>Pseudotaxiphyllum</i> R
<i>Harpalejeunea</i>		<i>Racomitrium</i>
<i>Herbertus</i>	R	<i>Sematophyllum</i>
<i>Jubula</i>		<i>Tetrastichium</i> R
<i>Lejeunea</i>	R	<i>Thamnobryum</i> R
<i>Lepidozia</i>	V	<i>Thuidium</i>
<i>Leptoscyphus</i>	V	<i>Ulota</i>
<i>Lophocolea</i>		
<i>Lophozia</i>		
<i>Marchesinia</i>		
<i>Metzgeria</i>		
<i>Mnioloma</i>	R	
<i>Nowellia</i>		
<i>Odontoschisma</i>		
<i>Plagiochila</i>		
<i>Porella</i>		
<i>Radula</i>	R	
<i>Saccogyna</i>		
<i>Scapania</i>		
<i>Telaranea</i>	R	
<i>Tylimanthus</i>	V	

(V, vulnerable; R, rare; RT, regionally threatened)



(T, Total number of genera; R, Number of genera with rare species associated; L, liverworts; M, mosses)

Below 1600 m, the total number of liverworts genera (32) is almost twice the number of mosses genera (18). Both on the first level (10 m) and the last level (1800 m), the number of genera was the same (5), although on the coast 3 liverworts and 2 mosses were present while on the mountain 4 mosses and only 1 liverwort were recorded.

At intermediate altitude, between the 600 m and 1000 m, a higher diversity of bryophytes was obtained: 33, 35 and 33 genera respectively. Regarding the distribution of genera with species included in the Red Data Book of European Bryophytes (ECCB, 1995), the pattern is similar in all the genera.

PRELIMINARY CONCLUSIONS

It is extremely important to know the updated distribution of species in order to promote their effective conservation.

The distribution pattern of species observed along the altitudinal gradient of Pico island shows, at the level of genera, a maximum of richness in the middle of the gradient; this corresponds to forest areas with more available substrata, taller trees and less human disturbance. In the Laurel forest area (from 600 m to 1000 m) a higher number of "rare genera" was detected: 21 different genera, whereas only 12 were sampled at lower altitudes and 5 at the mountain. These results agree with the Red Book of Bryophytes (ECCB 1995), stating that both the Laurel forest and Zimbral of Macaronesia are among the habitats with the highest number of endangered species in Europe (66!). In order to preserve these (and other) species it is advisable to survey and keep the areas already in the Natural Park of Pico, and find and establish new protection areas in the Azores.

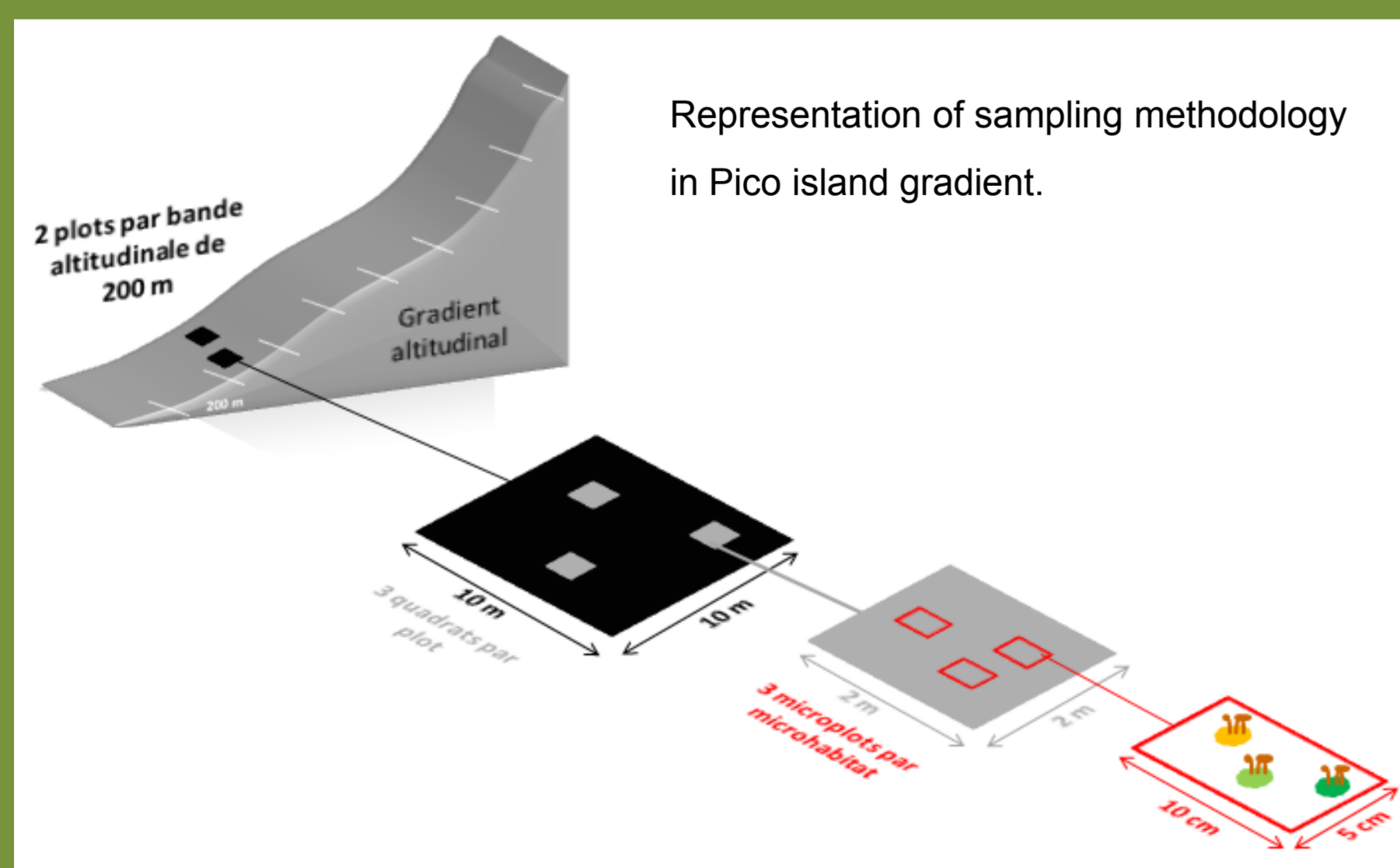
REFERENCES:

- ABP - Azorean Biodiversity Portal (2013). Bryophytes (mosses, liverworts, hornworts). <http://www.azoresbiportal.angra.uac.pt/> (accessed in July 2013).
- Ah-Peng, C., Wilding, N., Kluge, J., Descamps-Julien, B., Bardat, J., Chuah-Petiot, M., Strasberg, D., & Hedderson, T.A.J. (2012). "Bryophyte diversity and range size distribution along two altitudinal gradients: Continent vs. island". *Acta Oecologica*, 42, pp. 58-65
- ECCB (1995). "Red Data Book of European Bryophytes". European Committee for the Conservation of Bryophytes, Trondheim, Norway
- Homem, N. & Gabriel, R. (2008). *Brifótos raros dos Açores*. Estoril, Principia Editora.

METHODOLOGY

Field Work:

- 2 plots of 10 m X 10 m in elevational steps of 200 m altitude;
- 3 quadrats of 2 m X 2 m were randomly chosen;
- 9 microplots of 5 cm X 10 cm of bryophytes were collected in tree trunks of the most abundant native forest species, at three different heights.



(Adapted from Ah-Peng et al., 2012)

Lab Work

In the laboratory, bryophytes are identified and their abundance and sociability estimated.

SOME RARE SPECIES OF THE AZORES

