



Effect of Tree-Fall Gaps on Fruit-Feeding Nymphalidae Assemblages in a Peruvian Rainforest

Master Thesis 2010 Ecology & the Environment
Sylvia Pardonnet

Supervisors: Karl-Olof Bergman, Per Milberg & Harald Beck



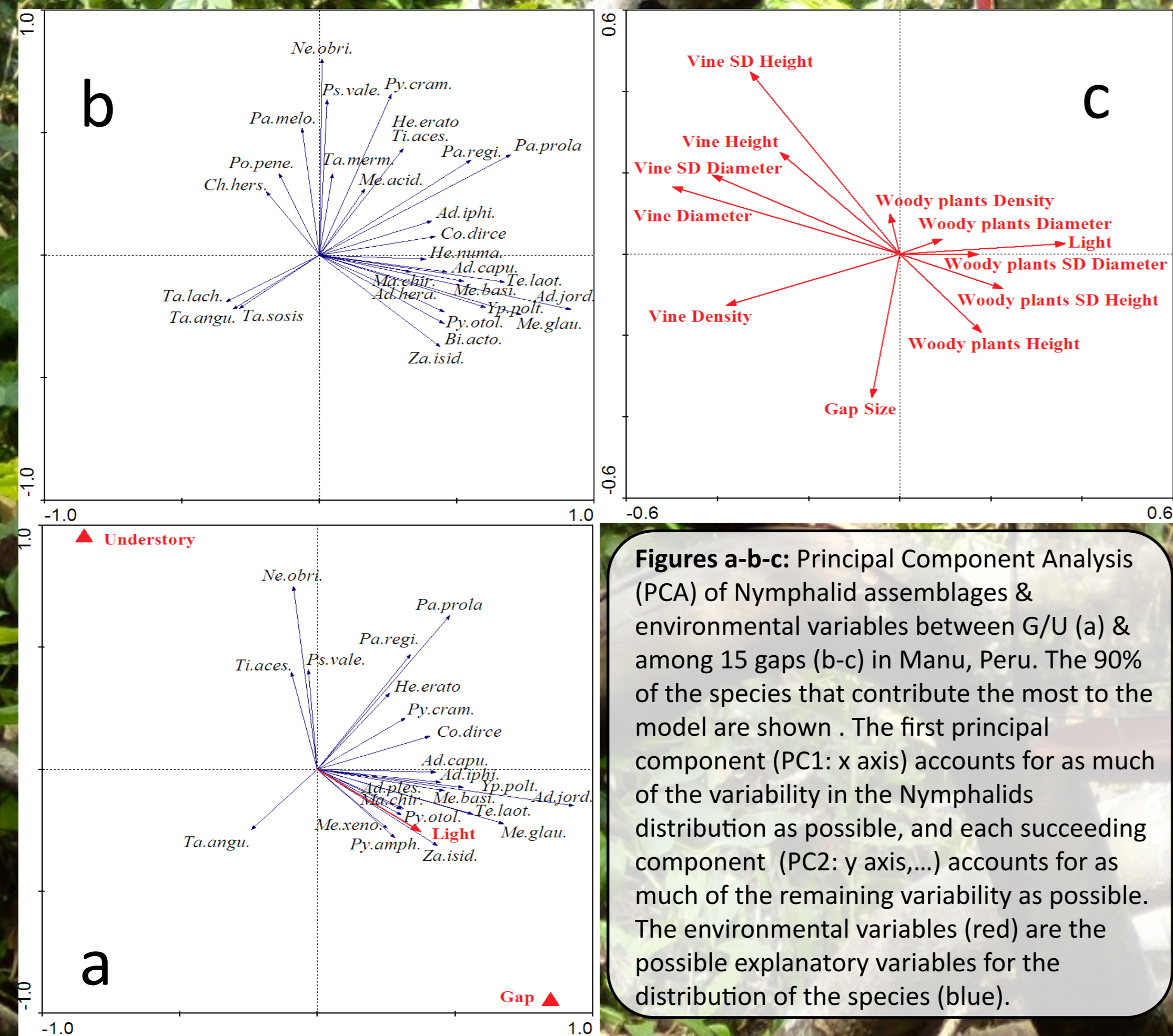
Introduction

Tropical rainforest contains the world's highest biodiversity. Natural tree-fall gaps are important disturbances, create specific habitats completely different from the understory. Fruit-feeding neotropical Nymphalids are useful bio-indicators. Hypothesis: Different Nymphalid assemblages between:

- Gap/Understory (G/U)
- Gaps (size gradient)

Material & Methods

Peruvian tropical rainforest
60 butterfly traps, banana attractant
15 Gaps (100-1000m²) & Understory
Mark-recapture study
Environmental variables measures



Figures a-b-c: Principal Component Analysis (PCA) of Nymphalid assemblages & environmental variables between G/U (a) & among 15 gaps (b-c) in Manu, Peru. The 90% of the species that contribute the most to the model are shown. The first principal component (PC1: x axis) accounts for as much of the variability in the Nymphalids distribution as possible, and each succeeding component (PC2: y axis,...) accounts for as much of the remaining variability as possible. The environmental variables (red) are the possible explanatory variables for the distribution of the species (blue).

Results & Discussion

1531 individuals (47% G) 82 species (71 G, 50 U)
4.3% recaptures 2.7% unidentified
PCA: Species distribution based on environmental components, identified according to the direction & length of the arrows
(a) Distribution explained partly by habitat (G/U) & light (PC1=17.5%, PC2=10.7%)
Species richer in lighted G
Dissimilarity between traps increases significantly with the gap size augmentation (p=0.057)
(b-c) Gaps: size, vegetation & light influence on the distribution (PC1=22.0%, PC2=11.3%)
Species richer in small open lighted G
Importance of vegetation structure:
Woody plants/Vines, Density, Height

Conclusion

Gap: highest biodiversity
Variation in disturbances matters
Habitat specialized species
Importance of **heterogeneity**
Other parameters

References

- Hill, J.K., Hamer, K.C., Tangah, J. and Dawood, M. (2001) Ecology of tropical butterflies in rainforest gaps, *Oecologia* 128, pp. 294-302
- DeVries, P.J. (1987) The butterflies of Costa Rica and their natural history, vol.1 Papilionidae, Pieridae and Nymphalidae, Princeton University Press, Princeton
- Lamas, G. (ed.) 2004 Atlas of Neotropical Lepidoptera, Gainesville: Scientific Publishers / Association of Tropical Lepidoptera

Acknowledgements

Karl-Olof Bergman, Per Milberg, Harald Beck
Cocha Cashu station, Natural History Museum (Lima)
Identification specialists & LiU

