M.Sc. Thesis:

Rapid assessment of species diversity in tropical rainforest

Background

The assessment of floristic diversity in tropical rainforests is time consuming and cumbersome due to high species richness, a large number of rare species and the mostly remote terrain. It is therefore necessary to design vegetation surveys in a way that they constitute an adequate balance between ecological accuracy and the amount of time and money spent. Data from previous vegetation surveys can help in developing more rapid and easy methods for future assessments.

The thesis can use an existing data set for one moist montane forest area in southwestern Ethiopia, which represents a detailed inventory of floristic diversity in 85 study plots (20m x 20m). The height of woody plants and climbers was recorded if $\geq$ 0.5m and the diamter at breast height (dbh) was recorded if $\geq$ 2cm. In total, 158 species of woody plants and climbers were found. Previous analyses (see Schmitt 2006) showed that both the altitudinal gradient and human management interventions had a strong effect on forest structure and species composition. The question is if these results could have been achieved by using a simpler and quicker survey method, e.g., by reducing the number of study plots, reducing the size of study plots or choosing a different cut-off level for dbh.

Research objective

Based on the existing data set, the thesis aims at developing a more rapid assessment method for future vegetation studies in the Ethiopian montane forests. In particular, it will evaluate to which extent the orginial data set can be reduced in terms of plot number, plot size and number of plant individuals without compromsing the identification of diversity patterns. The work is part of the research project "Evaluation of species-climate relationships in the Ethiopian moist montane forests" – see: http://www.landespflege-freiburg.de/forschung/aethiopien.en.html.

Approach

- Literature review on floristic diversity and survey methods in tropical rainforests.
- Data analysis using descriptive methods and multivariate statistics, e.g., ordination techniques.

Requirements

- Background in forest ecology and statistics.
- Interest in a more methodological topic.
- Some experience with data management (e.g., Access) and statistical software (e.g., CANOCO, PC-Ord, R).

References

Schmitt, C.B. (2006): Montane rainforest with wild *Coffea arabica* in the Bonga region (SW Ethiopia): plant diversity, wild coffee management and implications for conservation. *Ecology and Development Series* 47. Cuvillier Verlag, Göttingen.

Contact

Dr. Christine Schmitt
Chair for Landscape Management
Phone: +49 761 203-3630
Mail: christine.schmitt@landespflege.uni-freiburg.de