

Research Project

Mountain biodiversity in the Caucasus and its functional significance

Third-party funded project

Project title Mountain biodiversity in the Caucasus and its functional significance

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Organisation / Research unit

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Status Completed

Module 1: Slope stability and biodiversity in the Caucasus, a synthesis of available knowledge and recommendations

Grazing and erosion affect biodiversity on steep mountain terrain. In previous research, species had been identified and ranked which are particularly robust against erosion and thus useful for re-vegetation activities. A keystone species had been discovered (*Festuca valesiaca*) that exerts slope engineer functions as soon as erosion leads to gully formation and creates erosion edges. Surprisingly, the very same species had been found to play a similar role in the Swiss Central Alps. It will be a particular task to explore the role of this species, both, in the Great Caucasus and the Swiss Central Alps (previous SCOPES project; paper submitted by Caprez et al.; parallel project in Switzerland by Huck et al. in the uppermost Reuss valley). In a previous SCOPES project we had identified winners (such as *Festuca valesiaca*) and losers under overgrazing/erosion impact on mountain pastures in the Great Caucasus and will now explore their wider role in a greater geographic framework by testing this species ranking in a matrix of hundreds of relevés obtained over the last 40 years by the Georgian team (see module 2).

Each of the winner and loser species (a total of c. 50 species) will be characterized by range limits, centers of abundance in terms of elevation, geology and topography. These data will illustrate, which species are likely to come under threats when the climate gets warmer and moisture regimes more extreme. We expect to identify indicator taxa (or groups of taxa) that will tell us whether rangeland management in a given area is sustainable or not.

In essence Module 1 will synthesize the results of the empirical works (with fenced plots in the Sno valley) and will thus enable Khatuna Sharikadze to complete her PhD Thesis while at the same time the whole team will use previous inventory data to nest the new Sno valley results in a wider context. Very recently (1st April 2009), the Swiss Science foundation started granting a new interdisciplinary project called VALUrseren (CR30I3_124809/1), which is assessing the status and current change of vegetation cover and plant diversity, soil characteristics, erosion potential, and their combined effects on the water balance and soil integrity of the uppermost Reuss catchment in the Swiss Central Alps. Hence, this brings us in the extremely comfortable situation to be able to make comparative assessments in both the Alps and the Great Caucasus. This module will thus offer synergies with ongoing research in the Alps (similar works in Innsbruck and Grenoble), as had been our aim for many years, following the research agenda of the Global Mountain Biodiversity Assessment (GMBA) of DIVERSITAS.

Module 2: Biodiversity in the Great Caucasus: open access species database for improved biodiversity management and projections of trends under global change.

This module proposes an electronic biodiversity archive initiative, aiming at building a computer data base that includes both, archive data (herbarium) as well as observational data (relevé data) of more than 40 years of field work in steep mountain terrain by the Georgian team (many hundreds of 'relevés', each consisting of exactly geo-referenced species lists (or lists that can be georeferenced post hoc). This information is currently largely on paper. This data base will permit placing the results of module 1 in a wider geographical context, e.g. integrate data obtained from small scales up to regional level, by using spatial land cover information. At the same time, this database will open the possibility to link the Georgian field ecology community with the GBIF (Copenhagen) international biodiversity data portal, in particular to contribute to the Global Mountain Biodiversity Assessment (GMBA) mountain portal initiative with GBIF (online in late 2009). Such a database of the plant species of the Caucasus will become a prominent entry to GBIF and establish international cooperation of the Georgian Institute of Botany. This will permit a much larger comparison of typical settings of plant communities in steep mountains worldwide. Before this data base will go online and become public in the last year of the project, the team will distill large scale patterns of species diversity in the Great Caucasus with respect to land use and erosion aspects (see Module 1), climatic and topographic affiliations of certain taxa and elevational trends. A particular task will be identifying the environmental envelope of species that had been found to be key stone species for slope stability.

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Follow-up project of [5630 Towards sustainable use of mountain pastures in the Central Caucasus \(SCOPES – JRP\)](#)

Add publication

Add documents

Specify cooperation partners

ID	Kreditinhaber	Kooperationspartner	Institution	Laufzeit - von	Laufzeit - bis
96122	Körner, Christian	Nakhutsrishvili, George	N. Ketskhoverli Institute of Botany, 0107 Tbilisi	01.12.2009	30.11.2012