Rock particle size, Soil and vegetation transitions of the Central Great Caucasus

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Glaciers are a prominent feature in high mountains and can affect plant distribution along the gradients. However, the possible effect of glaciers on plant community structure at landscape scale is little studied. We describe and quantitatively analyze (linear and non-linear regression) vegetation patterns and environmental data (elevation, exposition, soil pH, plant available N, P and K) in an alpine desert along elevation range (3000-4000 m a.s.l.) on two contrasting slope aspects (N versus S) of Mt. Kazbegi, the Central Greater Caucasus, Georgia. According to research we have shown that soil pH increased monotonically (alkaline reaction) and more steeply on N than on S slope, Parallel plant available N, P and K decreased. Here we describe and quantitatively analyze vegetation patterns more accurately: Plant cover and Vegetation patches decreased sharply with increasing elevation. However, the reduction of plant coverage (%) is more pronounced at southern exposure this.

The analysis of vegetation patch membership, however, did reveal such a switch indicated by the strongly sigmoid shape of the dependence of solitary plant percent share in total vegetation patches on elevation gradient. Hill's sigmoidal function described these changes on both north and south slopes with a high accuracy.

Rocky environments usually represent extreme habitats with very sparse soil. plants that colonise rocky environments can contribute to rock fragmentation and soil formation. The second part of the study covered two regions (subnival zone habitats of the Central Caucasus slopes of Mt. Kazbegi and Mt. Tetnuldi). We described the distribution patterns of plants and rock particles of various sizes, and examined the possible links between these patterns using correlation analysis and multivariate tests. We found that, while large-sized rock particles (6-20cm; 20-60cm) prevailed on the surface, most plants were associated with relatively rare fine-grained substrata and, to a lesser extent, with even rarer soil-covered spots.