

Publication

Plant species dominance shifts across erosion edge-meadow transects in the Swiss Alps

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)**ID** 2117923**Author(s)** Huck, Corinne; Körner, Christian; Hiltbrunner, Erika**Author(s) at UniBasel** [Körner, Christian](#) ; [Hiltbrunner, Erika](#) ;**Year** 2013**Title** Plant species dominance shifts across erosion edge-meadow transects in the Swiss Alps**Journal** Oecologia**Volume** 171**Number** 3**Pages / Article-Number** 693-703**Keywords** Festuca valesiaca s.l., Landslide, Plant diversity, Slope stability, Soil moisture gradient

While exerting no obvious function under "average" environmental conditions, the presence of certain plant specialists becomes crucial in the event of a complete failure of a community due to severe disturbance such as landslides. Plants capable of growing at erosion edges may act as potential edge-engineers by coping with unstable ground and stabilizing the soil with their roots. We hypothesized that life conditions at erosion edges select for a particular set of specialists or species with specific traits, the identification of which was the aim of the study. Across 17 small-scale transects (0.40 x 1.60 m) from intact meadows to landslide edges (Ursern Valley, Swiss Alps, c. 1,600 m a.s.l.), we quantified plant species abundance by the point intercept method and characterized growth conditions based on Landolt's indicator values, leaf $\delta^{13}C$, and volumetric soil moisture in the uppermost soil layers. We observed a clear change of plant species composition and relative abundance from the meadow to the edge, presumably induced by the 25 % lower soil moisture and microclimatic exposure. Species richness at the edge was two-thirds of that in the meadow, but was positively correlated with species richness of the adjacent meadow. Species with "edge-preference" had either (1) rolled or festucoid leaves like *Festuca* spp., *Avenella flexuosa* and *Nardus stricta*, or (2) small, scleromorphic leaves like *Vaccinium vitis-idaea*, *Calluna vulgaris* and *Thymus* ssp. Graminoids with rolled/festucoid leaves were found to be the most dominant edge-specialists. The grass *Festuca valesiaca* s.l. emerged as the most dominant plant species at the edge, having an 11-times higher cover at the edge than in the meadow. In this montane grassland, a single species contributes to the stabilization of erosion edges and may be regarded as a potential keystone species for slope stability and regeneration after landslides even its role has not so far been established.

Publisher Springer**ISSN/ISBN** 0029-8549**edoc-URL** <http://edoc.unibas.ch/dok/A6165287>**Full Text on edoc** No;**Digital Object Identifier DOI** 10.1007/s00442-012-2583-6**PubMed ID** <http://www.ncbi.nlm.nih.gov/pubmed/23337968>**ISI-Number** WOS:000316339900009**Document type (ISI)** Journal Article