

Photo Story

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Research activities at the dry grassland sites in the LTSER site Matsch/Mazia valley, Italy

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The dry grassland sites in Matsch valley (Vinschgau, Northern Italy) are part of the Long-Term Socio-Ecological Research (LTSER) site Matsch|Mazia (LTER Italy). The area was previously presented by Hilpold et al. in PG 40 (2019). In the present contribution we focus on the scientific activities conducted in the LTSER area.

Due to the high mountains surrounding the valley (the highest peak, Weisskogel rises to 3739 m a.s.l.), the area is characterised by a pronounced inner-alpine continental climate with an average precipitation of around 525 mm per year and average temperature of 5.6 °C. The dry grassland sites are all situated on southern slopes and are grazed by cattle and sheep (0.5-1.5 livestock units per ha). On the lower elevations (~1000 m a.s.l.) the sites have the *Festucetum valesiacae* association that gradually convert to *Sieversio-Nardetum strictae* before reaching the highest site at 2500 m a.s.l. The soil pH decreases from 5.3 to 4.6 with increasing elevation.

For our team of scientists, the sites represent a unique opportunity to conduct elevational studies. They represent an ideal natural elevational transect of grazed grasslands that starts at the valley bottom (at approximately 1000 m a.s.l.) and ascends to the mountain top at 2500 m a.s.l. In the recent years, we have surveyed a large number of animal and plant groups, including grasshoppers, butterflies, ants, spiders, beetles, vascular plants, lichens, bryophytes and many others. The data collected were used to investigate elevational biodiversity patterns focussing on species richness and beta diversity as well as to explore conservation-related aspects to gain a better understanding of the distribution of rare species and specialists. Furthermore, we investigated the response of functional plant traits along the gradient, studied trophic structures of the soils and participated in a

global litter decomposition experiment (www.teacomposition.org). The dry grassland sites were also visited in 2016 by a large group of taxonomic experts during the annual “Biodiversity Day” which is organised by the Nature Museum of South Tyrol. Future surveys will be conducted in collaboration with Biodiversity Monitoring South Tyrol (<https://biodiversity.eurac.edu/>).

To link biological data to climate and soil properties, we installed several climate stations at various elevations including a large one at 1000 m a.s.l. We can therefore monitor precipitation, air temperature and humidity, wind speed and direction, snow and vegetation height, soil temperature, soil moisture, soil water potential, and solar radiation. For specific surveys we also use small soil temperature loggers and a mobile device named “Ecobot” which allows us to measure standard meteorological and hydrological parameters in situ.

During autumn 2019, the dry grassland sites were also included within a special travelling event (*Cammini*) initiated by LTER Italy. The *Socio-ecological marathon - 42 km of aL-TERNative transhumance* lasted three days during which more than 20 people walked from the Austrian LTER site Obergurgl to the Matsch|Mazia LTER site.

Further reading

- Damisch, K., Steinwandter, M., Tappeiner, U. & Seeber, J. 2020. Soil Macroinvertebrate Distribution Along a Subalpine Land Use Transect. *Mountain Research and Development*, 40: R1.
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Hilpold, A., Seeber, J., Fontana, V., Niedrist, G., Rief, A., Steinwandter, M., Tasser, E. & Tappeiner, U. 2018. Decline of rare and specialist species across multiple taxonomic groups after grassland intensification and abandonment. *Biodiversity and Conservation*, 27: 3729–3744.



Bryophyte experts at work. Photo: A. Schäfer-Verwimp.



The climate station at 1000 m a.s.l. is an appropriate place to present our research activities to the media.
Photo: M. Fontana.



Thomas Frieß from Ökoteam - Institute for Animal Ecology and Landscape Planning in Graz, surveying *Hemiptera*.
Photo: M. Fontana.



Erich Tasser using the so-called Ecobot – a mobile device for measuring in situ air temperature, radiation, soil moisture, and other parameters. Photo: F. Dalvit.



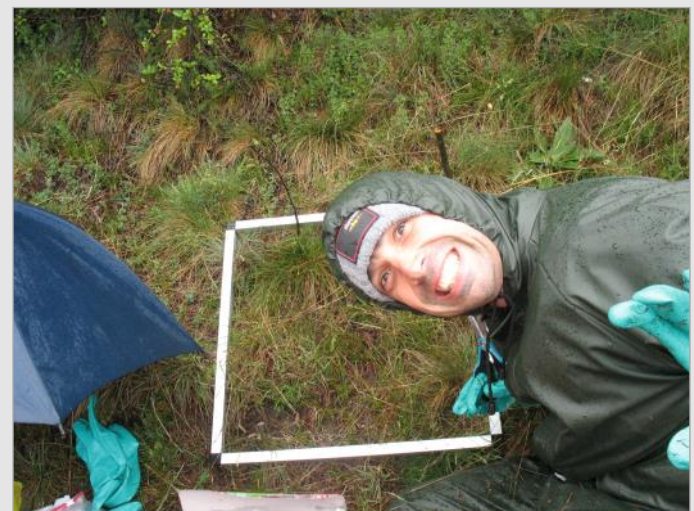
Andreas Hilpold identifying a butterfly. Photo: E. Gasser.



Johannes Klotz doing maintenance work at the climate station at 1000 m a.s.l. Photo: G. Niedrist.



Julia Seeber burying tea bags for the litter decomposition experiment. Photo: V. Fontana.



Georg Niedrist collecting plants for plant trait analyses and enjoying the weather. Photo: V. Fontana.



Michael Steinwandter and Veronika Fontana doing vegetation surveys in the dry grassland site at 2000 m a.s.l.
Photo: M. Fontana.



Michael Steinwandter and Laura Stefani taking a soil sample. Photo: I. Corrá.