Eastern Alpine and Dinaric Society for Vegetation Ecology

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Book of Abstracts

Tulipa kosovarica

Contents

Oral presentations

Tulipa kosovarica

Effect of climatic and topographic variables on NDVI variation in a sub-Mediterranean mountain pastoral system

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Pastoral systems have to face climate changes, since the increasing drought will affect herbage features, carrying capacity and animal welfare, representing a threat to biodiversity conservation and livestock rearing. As part of the CLIMAPP project (Climate changes, grasslands and livestock management: a multidisciplinary study to improve the sustainable development of Apennine pastoral systems), funded by the University Research Funds (FAR 2014-2015), using Remote Sensing multispectral images and a Digital Elevation Model (30 m pixel resolution), we examined the effect of climatic and topographic variables on the variation of the Normalized Difference Vegetation Index (NDVI) in a sub-Mediterranean pastoral system (central Apennines, Italy) in the period 2003-2015. NDVI is an indicator obtained from a spectral transformation of the Red and Near Infrared bands, which can be used to estimate many vegetation properties, such as grassland productivity, since these bands are closely related to the absorption of photosynthetically active radiation by green vegetation. We mapped the NDVI of our study area and randomly extracted 10,000 pixels falling on grasslands. We collected topographic parameters for each pixel (altitude, aspect, slope and land form) and climatic variables (average monthly temperatures and monthly precipitation), and calculated bioclimatic indices. We used Redundancy analysis, variation partitioning and generalized linear modelling to investigate and model the influence of the set of explanatory variables on the NDVI data set.

The considered variables explained about the 40% of the total NDVI variability, most of which was related to climatic parameters, while topographic variables (especially aspect) mostly acted in intensifying the effects of climate variations.

The next research step will be the establishment of a monitoring system based on ground-truth data (geo-referenced samples of above-ground phytomass), which will be related to NDVI and other vegetation indices obtained from Remote Sensing images, in order to build a predictive model of pastures productivity.

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