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***Management and Conservation of Semi-natural
grasslands: from theory to practice***

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BOOK OF ABSTRACTS

(Oral and poster presentations, in alphabetical order of
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Cover picture: xerophilous/xero-mesophilous grasslands on slumping mounds (Rom: *movile*) near Apold, Romania

Owen Mountford 2008

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How modifications of forage features related to inter-annual rainfall variations affect sheep morpho-physiological characteristics

Paola Scocco¹, Federico Maria Tardella¹, Karina Piermarteri², Alessandro Malfatti¹, Andrea Catorci¹

¹School of Biosciences and veterinary medicine-University of Camerino, Italy

²School of Advanced Studies-University of Camerino, Italy

Corresponding author: paola.scocco@unicam.it

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The sub-Mediterranean climate, mostly characterising the mountain regions sited all around the Mediterranean basin, is a variant of the Temperate bioclimate, characterised by winter cold stress and summer drought stress, the intensity and duration of which depend on the elevation gradient and land form factors. Models for the sub-Mediterranean regions indicate a strong increase of summer dry conditions and a more marked inter-seasonal and inter-annual variability, with maximum changes in summer and minimum changes in winter.

We aimed to assess the interplay among plant community characteristics, inter-annual climatic variations and sheep morpho-physiological features to model the responses of sub-Mediterranean pastoral systems to climate change and management modification.

We tested the hypothesis that the inter-annual climatic variability affects grassland productivity and feed value with different intensity (depending on slope angle and aspect) and causes variations in sheep rumen features (epithelium keratinisation degree) and animal body state estimated by means of Body Condition Score (BCS) method. We postulated that there is a significant correlation among grassland features, rumen characteristics and animal body state.

Results showed that in the sub-Mediterranean climate increased summer drought stress negatively affects forage quantity and quality, and that type and direction of changes are quite different from those reported for both Mediterranean and Temperate regions. In particular, the most negatively affected plant communities were those of productive habitats, which also undergo a strong decrease of the summer forage re-growth ability. These habitats are foundational for the sustainability of extensive sheep farming in sub-Mediterranean mountains, since those of south-facing slopes are normally fully dry in summer. Grasslands of south-facing slopes are more affected by the decrease of late-spring/summer rainfall variation, and by the seasonal rainfall patterns. Changes in forage features, and in particular the increasing fibre amount led to increase the rumen keratinisation. When the degree of keratinisation increases, the absorptive ability decreases, so we can infer that drought intensification reflects in a sheep's lessened ability to absorb nutrients because of increases in the rumen keratinisation degree, negatively affecting also the animal body state. Differences of BCS among years were significant in late summer, which is the mating period for sheep. In the driest year the end-August BCS drops down largely below the value considered sufficient to ensure the animal breeding/milking performances. Reduction of summer rainfall greater than 15–20% compared to the normal average value might be detrimental for semi-extensive rearing sustainability in sub-Mediterranean climate.