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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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Functional response of an invasive tall grass (*Brachypodium genuense*) to environmental variability in sub-Mediterranean climate

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Semi-extensive farming cessation and settlement abandonment are threatening European pastoral landscapes and their biodiversity, affecting species assemblage and ecosystem functioning. This process typically involves the invasion of coarse tall grasses mostly with competitive stress-tolerant strategies and quickly developing mono-dominance stands. A problematic species in this respect is *Brachypodium genuense* (DC.) Roem. et Schult., an endemic, rhizomatous, tall-grass occurring in the semi-natural grasslands of the Italian peninsula over 1200-1400 m a.s.l. Because of this, we need to deepen our understanding of ecological factors allowing its spread, and of the relationships between its functional features and environmental constraints. The latter is a key issue since traits reflect the trade-offs among different functions within a plant and variations in resource availability proved to determine their intra-specific variation. Therefore, the intra-specific trait variation assessment is a paramount condition to predict species performances in the light of environmental changes.

We hypothesised that *B. genuense* was able to spread and dominate the grassland communities undergoing a wide range of environmental conditions, thanks to its ability of changing its performances, showing large morphological and physiological plasticity, mirrored by high variations of traits, namely Specific Leaf Area (SLA), individual height and tussock cover values.

The study area encompasses the Monti Sibillini National Park (central Italy), characterised by limestone bedrock, within the temperate region, near the border of the Mediterranean one.

We found that in more productive conditions (deeper soil, medium/high pH values, north-facing slopes, and “conservative” land forms) populations of *B. genuense* showed higher SLA, plant height and cover values. This underlies a fast-growing strategy based on high resource acquisition/use rate, as well as higher competitive ability for above-ground resources (*e.g.* light). The opposite trend emerged for unproductive/dry conditions (south-facing slopes, shallow soils, lower pH values). Under these constraints, SLA, plant height and cover value decreased underlying a slow-growing strategy with high conservation and low acquisition rate of resource. In addition, we found that very high nitrogen amount might have a detrimental effect on *B. genuense* individuals decreasing the SLA values, thus requiring the plant to change the growth strategy.

We also inferred that the invasive/dominant behaviour of competitive-stress tolerant tall grasses is related not only to clonal integration strategy, plant height, litter deposition, *etc.*, but also to the morphological plasticity of leaves, allowing plants to maintain the coordination of multiple resource capture and, hence, to sustain dominance.