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Cinque Terre National Park vineyards: soil microarthropod community and biodiversity

Sauro Simoni (1), Roberto Nannelli (1), Marisa Castagnoli (1), Matteo Perrone (2), Lorenzo Corino (3), Silvia Guidi (1), Donatella Goggioli (1), Franca Tarchi (1), and Elena Gagnarli (1)

(1) CRA-ABP, Consiglio per la Ricerca e Sperimentazione in Agricoltura - Research Centre for Agrobiology and Pedology, via Lanciola 12/a, Firenze, Italy (sauro.simoni@entecra.it), (2) Parco Nazionale delle Cinque Terre, Area Marina Protetta delle Cinque Terre, Via A. Discovolo, Riomaggiore (La Spezia), (3) CRA-ENO, Consiglio per la Ricerca e Sperimentazione in Agricoltura - Research Centre for Oenology, via P. Micca, 35, Asti, Italy

The study was part of the LABTER (Laboratory for the sustainability of the viticulture in the 5 Terre Park), a project aiming at gathering knowledge on quality of viticulture and stability of soils in the 5 Terre National Park, territory protected by UNESCO, by means of a multidisciplinary approach. The Cinque Terre is a particular area on Italy's coast, with terraced hillsides mainly devoted to viticulture and quite homogeneously managed. The relationship between biodiversity and soil processes is primarily defined by dynamics and interactions in the soil community food webs. The abundance and structure of microarthropod communities are highly respondent to different soil 'status' and quality.
The aims were to study soil microartropods' community of terraced vineyards and to evaluate microarthropod distribution at different altitudes and distance from the seaside.
The experimental design was set with five samplings in five different areas of the Park, at different altitudes, between 50 and 400 meters above the sea level, and at different distance from the sea. All the microarthtropods were counted, identified and classified up to Order level, at least.
On the whole, by considering all the microarthropods collected (6,739 specimens), mite community represented the most numerous group (56.6%), followed by Collembola (35.2%). Within mite groups, Oribatids were the most numerous with the higher number of species, about 40, followed by Prostigmata, Mesostigmata and Astigmata.
The ANOVA analysis showed that the density of microarthropods was affected by sampling time ($F_{4,111}= 7.27$; $P=.000$) and sampling location ($F_{4,111}= 7.01$; $P=.000$). On the whole, the highest densities were registered at the end of Summer and the beginning of Autumn. As regards the sampling location, oribatid mites ($F_{4,111}= 3.38$; $P=.012$) and springtails ($F_{4,111}= 6.30$; $P=.000$) were the groups more affected by sampling sites.
The biological soil quality was also defined through the determination of the qualitative QBS-ar (Quality Biological Soil - arthropods) index (Parisi, 2001). In each location, this index showed values higher than 100, by denoting a high soil quality for richness in biodiversity. The highest QBS-ar, 150, was found in Porciana site, in the vineyards at higher level above the sea.
In the vineyards of the Cinque Terre, both density and number of specimens collected, and the diversity of edaphic species identified were quite high compared to other agricultural land and vineyards.