SOIL BIODIVERSITY AND SUSTAINABLE VINEYARDS: HINTS FROM THE ANALYSIS OF MICROARTHROPOD AND CILIATED PROTOZOA COMMUNITIES

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Soil biodiversity constitutes one of the main components of agroecosystems, being involved in the delivery of several essential ecosystem services such as, among others, nutrient cycling, soil formation, pest and pollution control. Thus, soil biodiversity indicators can be used by governments and farmers to monitor soil quality and ecosystem functioning under various land uses and management practices. In this scenario, the aim of our study was to assess the long-term effects of organically managed vineyards on soil quality by means of two bioindicators: protozoan ciliates and microarthropods. The study was realized in the *terroir* of *Verdicchio di Matelica* (Marche, Italy), on three vineyards that were organically managed since 1992, 1998 and 2009 respectively. In each vineyard, soil samples (0-10 cm depth) were taken every month from March to October 2011. In addition, soil chemical-physical (texture, soil moisture, pH, NPK, OM, C/N, Cu), were measured in each site. For microarthropods, the measured biological parameters were: the Soil Biological Quality (QBS-ar) index, abundances of Biological (BF) and Euedaphic forms (EF) and diversity indices. Soil samples were collected in both disturbed (tillage) and not-disturbed (no-tillage) inter-rows. For ciliates: abundances and diversity indices were measured and soil samples were randomly collected in the whole sampling area. The results of the multivariate data analysis (Cluster Analysis, CA; non-metric Multi-Dimensional Scaling, nMDS) and diversity indices (*H',J,d*) indicate that the most stable habitat for ciliates and microarthropods is represented by the "older" (V92) followed by the V98 and the "younger" V09 vineyards. Collectively, the data seem to indicate that the long-term organic management of the soil contributes to global soil quality in vineyards at least in this particular pedoclimatic area and for the investigated bioindicators. Furthermore, this study helps in the definition of possible biotic baseline values to evaluate soil quality/health in vineyards.