



Response of soil biota to vineyard interrow soil cultivation can be altered by the surrounding landscape

Johann Zaller (1), Jacob Buchholz (1), Pascal Querner (1), Daniel Paredes (2), Sophie Kratschmer (3), Martina Schwantzer (3), Silvia Winter (3), Peter Strauss (4), Thomas Bauer (4), Françoise Burel (5), Muriel Guernion (5), Jennifer Scimia (5), Annegret Nicolai (5), and Daniel Cluzeau (5)

(1) Institute of Zoology, University of Natural Resources and Life Sciences Vienna (BOKU), Austria, (2) Estación Experimental del Zaidín, CSIC, Granada, Spain, (3) Institute of Integrative Nature Conservation Research, University of Natural Resources and Life Sciences Vienna (BOKU), Austria, (4) Institute for Land and Water Management Research, Austrian Federal Agency for Water Management, Petzenkirchen, Austria, (5) University Rennes 1, UMR EcoBio, Paimpont, France

Ecosystem services provided by viticultural landscapes result from interactions between management intensity, soil properties, organisms inhabiting these landscapes, and the diversity and structure of the surrounding landscape. However, there is actually very little known to what extent these different factors influence the abundance and diversity of various soil biota. In this study we examined (i) to what extent different soil management intensities of interrows affect the activity and diversity of soil biota (earthworms, Collembola, litter decomposition), (ii) the role of soil properties in influencing these effects and (iii) whether the surrounding landscape structure is altering these interactions. We collected data in 16 vineyards in Austria embedded in landscapes with varying structure (i.e. from structurally simple to complex) and assessed earthworms (hand sorting), Collembola (pitfall trapping and soil coring), litter decomposition (tea bag method). Additionally, soil physical (water infiltration, aggregate stability, porosity, bulk density, soil texture) and chemical (pH, soil carbon content, cation exchange capacity, potassium, phosphorus) parameters were assessed. The landscape surrounding our vineyards within a radius of 750 m was assessed by field mapping using a geographical information system. Results showed that different soil biota/processes are differently affected by soil cultivation intensity and soil properties. Parameters describing the surrounding landscape interacted more with the responses of Collembola to soil cultivation than with earthworms or litter decomposition. These investigations are part of the transdisciplinary BiodivERsA project VineDivers (www.vinedivers.eu) and will ultimately lead into management recommendations for various stakeholders.