

# Vineyard in-row and cover crop management affects mesofauna composition



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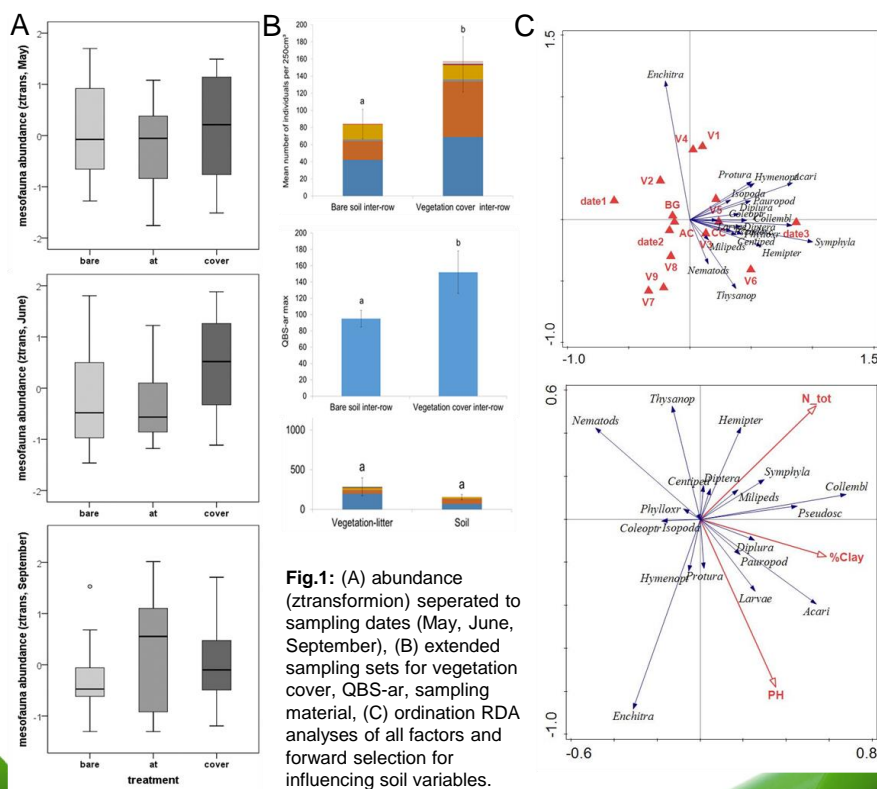
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## Introduction

Grapevine as crop of high economic value has due to its perennial nature also the possibility to establish sustainable production system with lower external inputs and increased biodiversity. Biodiversity especially in the soil is influenced by environmental factors as well as management practices. The presented study focuses on the biodiversity of the mesofauna in 9 Austrian vineyards each with three different inter-row management systems. Samples from the inter-row, as well as in-rows of selected vineyards were collected. The mesofauna reacts on changing environments very fast making them interesting candidates as bioindicators for soil quality. Their contribution to important ecosystem services as decomposition, nutrient cycles and soil structure is well known. The habitats of mesofauna are soil pores in the uppermost soil, litter on the soil surface and within the vegetation.

## Objectives

- Vineyard management dependent effects on abundance and diversity of mesofauna
- Habitat dependent composition of the mesofauna



## Key results

- ❖ Total number of individuals 10455; highest abundance for Acari, Collembola and Enchitraeide
- ❖ Sampling dates had an influence on abundance: highest abundance in September, similar counts in May and June
- ❖ Vineyards with very similar mesofauna abundance
- ❖ Treatment effects were dependent on sampling dates: date 2 with higher values in treatment cover; (Fig1A)
- ❖ 2 vineyards with increased sampling set: abundance in litter layer higher as in soil samples; abundance and QBS-ar higher in inter-rows with vegetation cover; no difference in mechanical and herbicide weed control (Fig. 1B)
- ❖ Ordination analyses with RDA: all factors (vineyard, treatment, sampling date) explained only 23% with the first 2 axis (Fig1C)
- ❖ Forward selection analyses (RDA): strongest correlation with pH and total N content, but community explanation only 8%

## Materials and Methods

Soil samples were collected in June 2016 in the frame of the BiodivERSA/FACCE-JPI joint project "PromESSinG" in nine Austrian vineyards in Lower Austria (Krems, Langenlois) and Burgenland (Großhöflein, Eisenstadt) three different practices for inter-row management: open bare soil, alternate soil cover, permanent soil cover. Soil samples were collected in May, June and September from all treatments and vineyards in duplicates, whereas each sample represents a pool of 10 core borer (0-10cm) samples. Berlese-Tullgren method was used for mesofauna extraction. Taxa and family determination occurred with the help of a simplified key provided by project partners (Gifford personal communication). Data analyses were performed with SPSS and Canoco 5.

