Multiple re-current drought events shift the responses of the soil microbial community to a subsequent drought

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INTRODUCTION

Climate change is radically altering the frequency of drought events. The response of an ecosystem to each new disturbance will likely be contingent on the history of precedent events. As soil microorganisms are central to biogeochemical cycles of carbon (C) and nutrient, it is pivotal to understand their response to drought, considering past events.

OBJECTIVES

Analyzing the response of a grassland microbial community and their mediated processes to long term recurrent drought events.

METHODS

We compared soil subjected to 10 years of recurrent drought vs 1 year drought.

We analyzed:

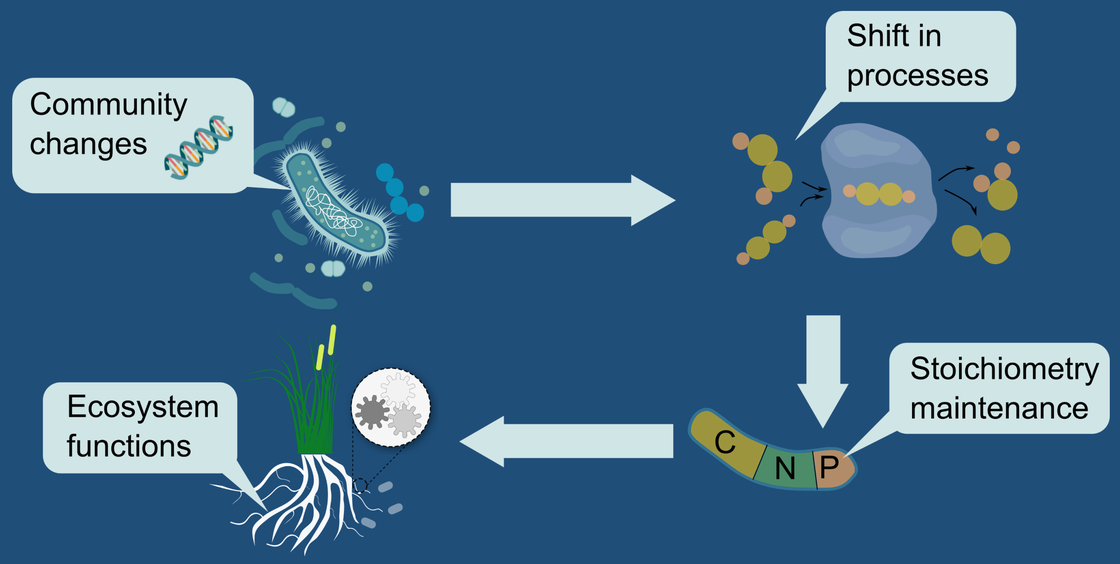
1) Microbial community (amplicon sequencing)

2) Microbial stoichiometry (C,N,P)

3) Soil processes (10 potential enzymatic activities)

Field site location

Drought history modifies the **soil microbial community** and the response to a new drought event of the mediated **soil processes**, with consequences for the **ecosystem functioning**.



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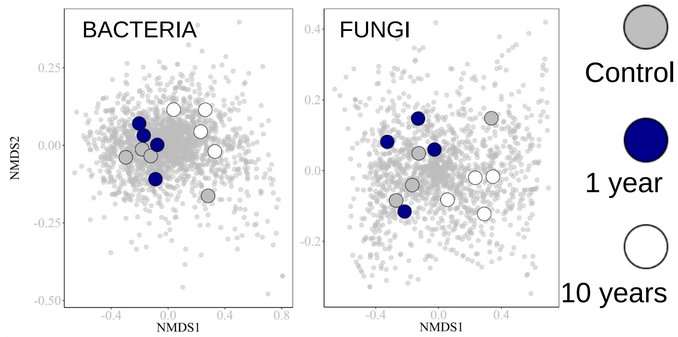
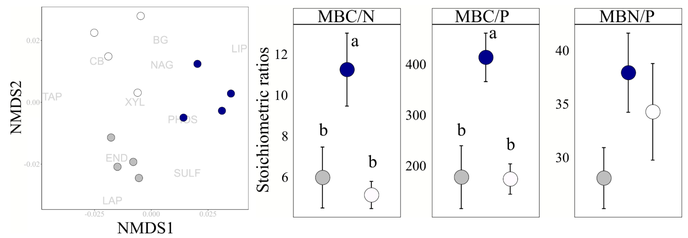
RESULTS

Amplicon sequencing analysis: NMDS of shifts in the soil microbial community of bacteria (16S) and fungi (ITS1) in the10 years treatment



Enzymatic activity and microbial stoichiometry analysis: NMDS of shifts in the potential enzymatic activities (left) and stoichiometric ratios of the microbial biomass C,N and P.



DISCUSSION

Drought history causes a shift in the microbial community and its potential enzymatic activities are modified enabling soil microbes to maintain stoichiometric values similar to control.

Taken together, our results show that recurrent drought events can modify the microbial community response to drought with important consequences for the ecosystem functioning.