Salt-pulsed contamination may be more deleterious in streams receiving high quality leaf litter

[1,2]Oliveira, R., [2]Martínez, A., [2]Gonçalves, A.L. & [2]Canhoto, C.

[1] ricpedro.oliveira@gmail.com, CFE-Centre for Functional Ecology – Science for People and the Planet, Associate Laboratory TERRA, Department of Life Sciences, University of Coimbra, 3000-456 Coimbra, Portugal
[2] CFE-Centre for Functional Ecology – Science for People and the Planet, Associate Laboratory TERRA, Department of Life Sciences, University of Coimbra, 3000-456 Coimbra, Portugal

Introduction:

Human activities cause, increase and intensify freshwater salinization, threatening their structure and functioning;
The entry of salt into these ecosystems can occur chronically or in pulses, and there is little information on the effects of contamination by pulses on the decomposition of organic matter and the organisms that take part in it.

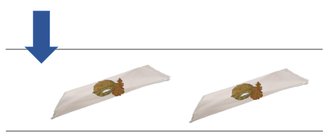
Main Goal:

Evaluate the effects of NaCl pulse contamination on the decomposition of *Alnus glutinosa* and *Quercus robur*, mediated by microorganisms, during and after the addition of NaCl, in a manipulated watercourse.

Methods:

Colonization:

Colonization during 10 days



Salinization:

Increment of NaCl concentration during 80 minutes, 7 days

Recovery:

Recovery during 4 days

Parameters assessed in each period:

- Leaf mass loss
- Microbial activity
- Fungal biomass
- Sporulation
- Fungal communities

Results:

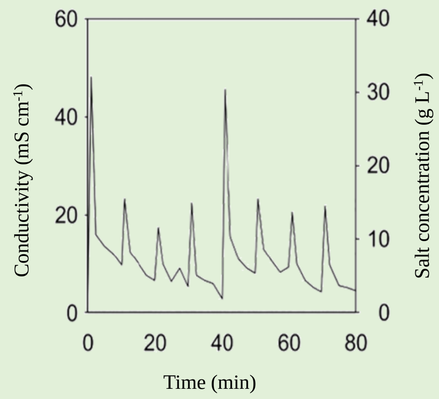


Figure 1: Conductivity and salt concentration (average 7 days) in salinized channel

Higher values - 40 mS cm^{-1} - ± 30 g L^{-1} NaCl – during 80 minutes of salinization

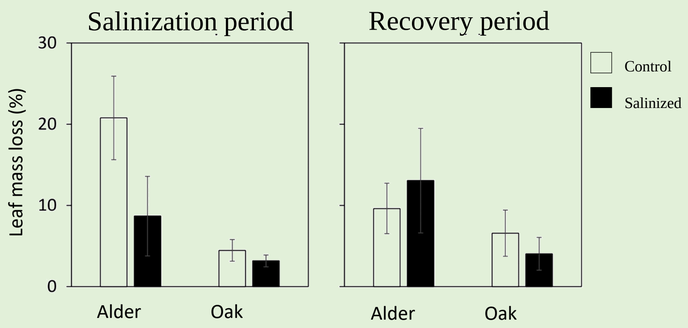


Figure 2: Leaf mass loss during periods of salinization and recovery of alder and oak leaves subjected to control and salt pulses conditions.

Salinization period

Alder: Control > Salinized

Oak: Control = Salinized

Recovery period

Alder: Control = Salinized

Oak: Control = Salinized

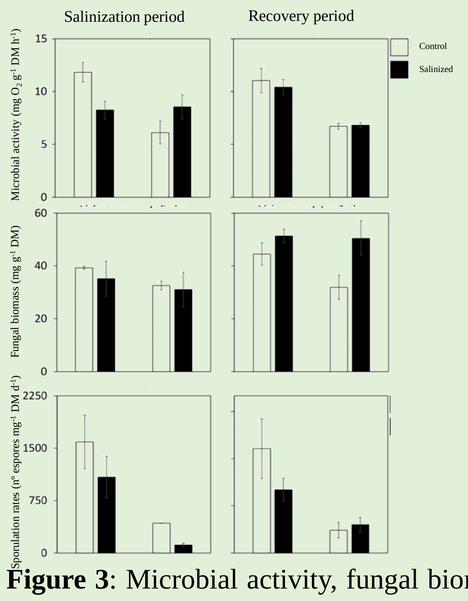


Figure 3: Microbial activity, fungal biomass and sporulation during periods of salinization and recovery of alder and oak leaves subjected to control and salt pulses conditions..

Microbial activity:
Differences only in the salinization period:
Alder: Control > Salinized
Oak: Control = Salinized

Fungal biomass:
Differences only in the recovery period:
Alder: Control = Salinized
Oak: Control < Salinized

Sporulation:
Differences only in the salinization period:
Alder: Control > Salinized
Oak: Control > Salinized

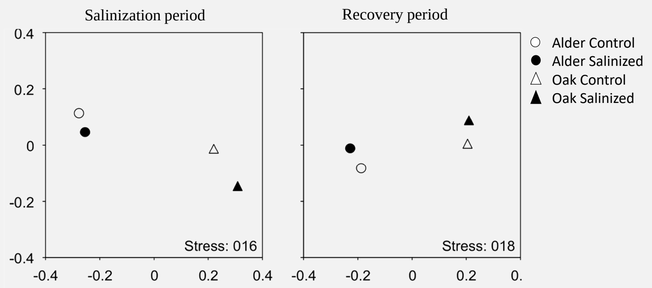


Figure 4: Fungal communities during periods of salinization and recovery of alder and oak leaves subjected to control and salt pulses conditions.

Distinct communities on oak leaves

Conclusions:

- Negative effects on mass loss and microbial respiration of alder; changes in the structure of the fungal assemblages of oak;
- No effects on fungal biomass under pulsed salinization;
- Sporulation depressed independently of leaf quality;
- Most salt contamination effects did not persist 4 days after the cessation of salt pulses (7 days) in either leaf species;

The negative effects of pulse salinization depend on leaf quality and are more deleterious in higher quality substrata

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