

# Interactive effects of *Epichloë* endophytes and plant origin on mineral content in *Festuca rubra*

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## Introduction

*Festuca rubra* L. is a perennial grass very persistent and tolerant to a wide range of ecological conditions. This grass species (Photo 1) is asymptotically infected by the systemic fungal endophyte *Epichloë festucae* (Photo 2) across European grasslands from Spain to northernmost Finland and Norway.

*Epichloë* endophytes are seed transmitted and can be beneficial for host grasses. The effects of endophyte are variable and dependent on the fungal and plant genotypes as well as environmental conditions.

## Objective

To determine the effect of *Epichloë* endophyte on the mineral content of *F. rubra* plants originally collected from different geographic locations across Europe, when grown under the same environmental conditions.



Photo 1: Red fescue (*Festuca rubra*)

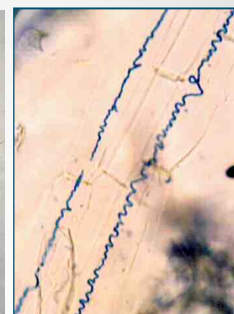
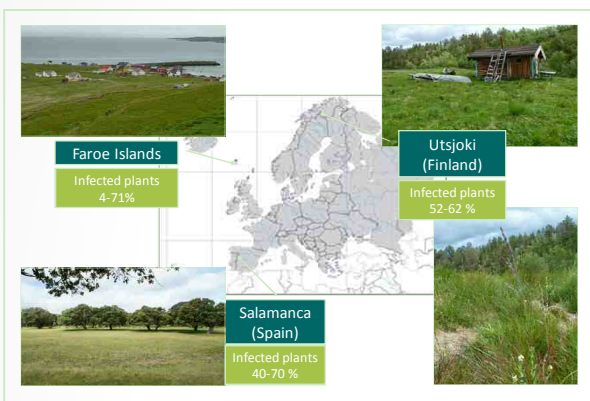


Photo 2: Mycelium of *Epichloë* growing intercellularly in the leaf sheath of its host plant

## Materials and Methods



Collection of *Festuca rubra* plants and percentage of infection with *Epichloë festucae* endophyte.



Endophyte infected plants (E+; n= 95) and uninfected (E-; n=58) were trasplanted in an experimental field in Spain (Salamanca).

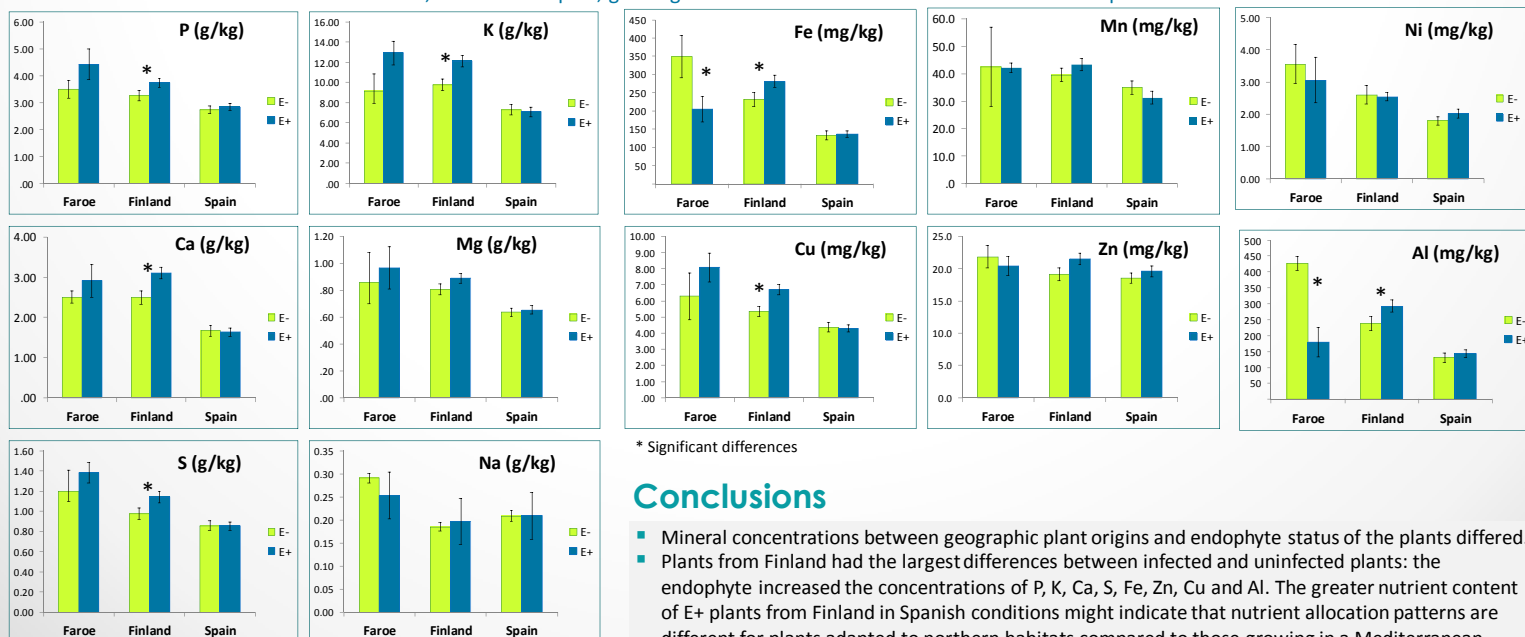
Growth from October to June

Harvest  
Aboveground biomass

Mineral elements  
(P, K, Ca, Mg, S, Fe, Mn, Zn, Cu, Na, Al, Co and Cr) were determined by ICP.

## Results

Mineral content in endophyte infected (E+) and non-infected (E-) plants of *Festuca rubra* from Faroe Islands, Finland and Spain, growing under the same environmental conditions of Spain



\* Significant differences

## Conclusions

- Mineral concentrations between geographic plant origins and endophyte status of the plants differed.
- Plants from Finland had the largest differences between infected and uninfected plants: the endophyte increased the concentrations of P, K, Ca, S, Fe, Zn, Cu and Al. The greater nutrient content of E+ plants from Finland in Spanish conditions might indicate that nutrient allocation patterns are different for plants adapted to northern habitats compared to those growing in a Mediterranean habitat.
- Plants from northern Europe (Faroe Islands and Finland) had on average a greater concentration of most mineral elements than plants from southern Europe (Spain).

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