

Incidence of *Epichloë festucae* in *Festuca rubra* plants of natural grasslands and presence of double-stranded RNA fungal viruses

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In semiarid grasslands of Western Spain, *Festuca rubra* is a very common species. This grass is a host of *Epichloë festucae*, a fungal endophyte. In populations of *F. rubra* infected by *E. festucae* most plants are asymptomatic but a few plants develop choking stromata in all or some of their flowering stems. Plants infected by this fungus show resistance to herbivores and tolerance to several abiotic stresses.

Many of the known fungal viruses cause no obvious symptoms. Fungal virus genomes are commonly composed of double-stranded RNA (dsRNA). The presence of two dsRNA viruses with genomes of 5.2 (EfV1) and 3.2 kbp (EfV2) was previously described in an isolate of *E. festucae*. EfV1 is a member of the family *Totiviridae* and of the genus *Victorivirus*.

OBJECTIVES

1. To determine the frequency of infection by the endophyte *E. festucae* in *F. rubra* plants from wild populations in grasslands of Western Spain.
2. To estimate the incidence of infection by EfV1 and EfV2 in *E. festucae*.
3. To find out if there are differences in nutrient content among virus-infected and virus-free *E. festucae* isolates.



MATERIALS AND METHODS

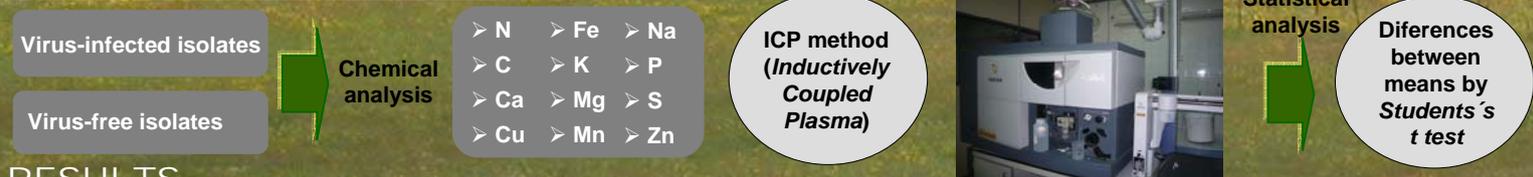
Isolation and identification of *E. festucae*



dsRNA extraction



Chemical analysis

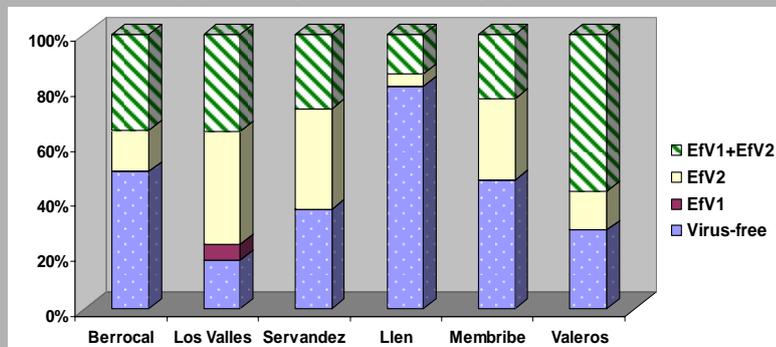


RESULTS

1. Incidence of infections: *Epichloë festucae* in plants of *F. rubra* and mycoviruses in *E. festucae* isolates

Location	Plant infection		Virus infection	
	Nº of plants	% plants infected	Nº of isolates	% isolates infected
Berrocal	34	59	20	50
Los Valles	21	81	17	82
Servández	25	44	11	64
Llen	24	87	21	19
Membribe	28	61	17	53
Valeros	29	24	7	71
Mean	27	59	15	57

2. Frequency of EfV1 and EfV2 virus infections (%) in six *Epichloë festucae* populations



3. Differences in nutrient content in *Epichloë festucae*

Statistical analysis did not detect significant differences ($P > 0.05$) in the chemical composition of infected and uninfected isolates (data not shown)

CONCLUSIONS

- The results of this survey suggest relatively high levels of infection in *Festuca rubra* plants by *Epichloë festucae* (average 59%) and in *E. festucae* isolates by mycoviruses (average 57%).
- No significant effect of virus infection on the chemical composition of the *E. festucae* isolates was found.