"Comparison of airborne pollen types in Badajoz (SW Spain) and Évora (SE Portugal)"

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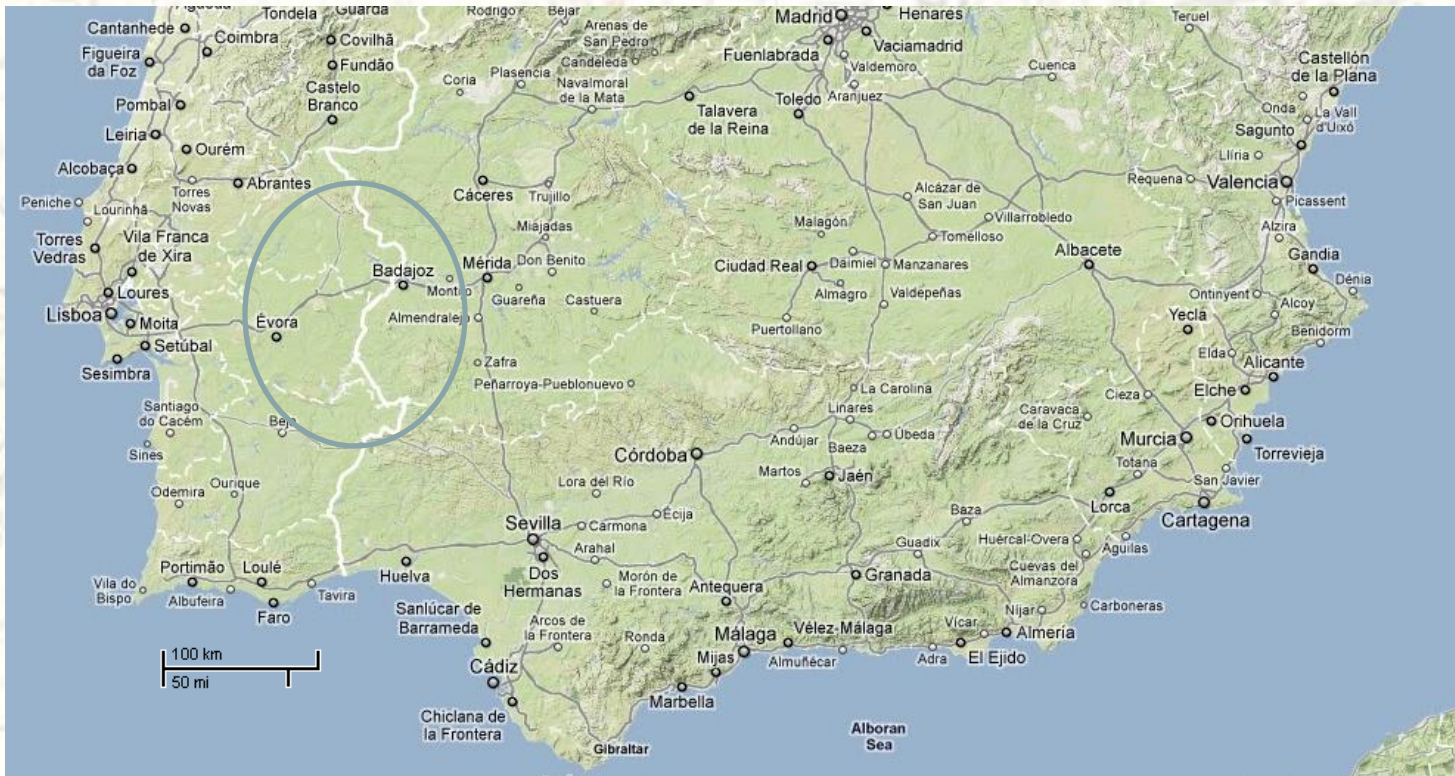**Inmaculada Silva Palacios** [2]
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Introduction

•Spatial and temporal variations in daily pollen counts and weather variables are described for two cities:

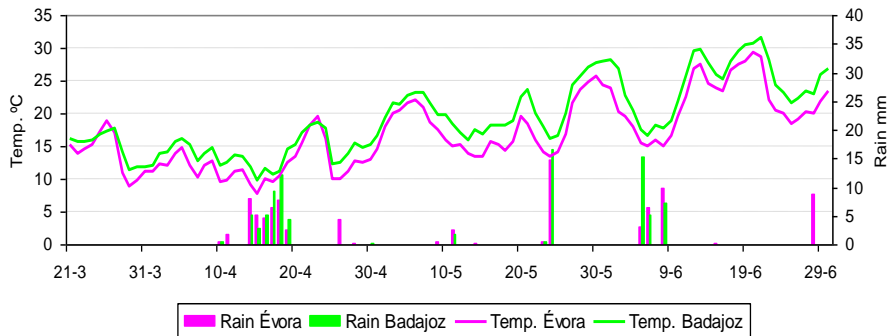- Badajoz (SW Spain) and Évora (SE Portugal)

Comparison of airborne pollen types in Badajoz (SW Spain) and Évora (SE Portugal)
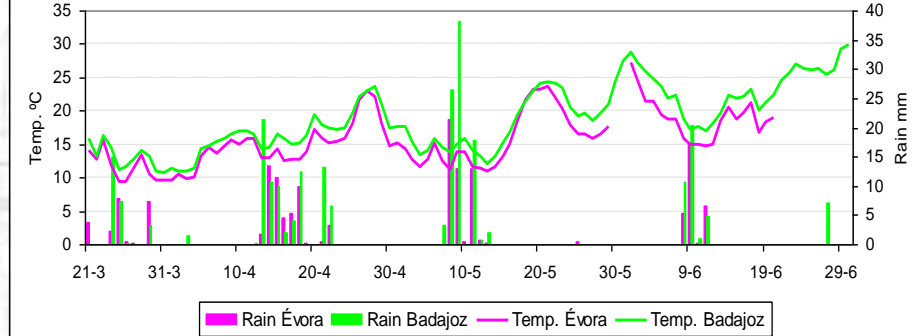
Introduction

• Two places with similar biogeographical and climate regimes.


2009. Évora, Badajoz

2010. Évora, Badajoz

• Aim:

 - to evaluate differences and similarities aerobiological sampling between two different cities of the Southwest Iberian Peninsula, taking into account the meteorology.

Material and methods

- Places studied:
  - Badajoz (SW Spain)
  - Évora (SE Portugal)
- Period studied: Spring of two years (2009 and 2010)
- Samplers used, and height:
  - Badajoz: Agrarian Engineering School (AES), 6 m
  - Badajoz: Faculty of Science (FS), 16 m
  - Évora: National Institute of Meteorology (NIM),17 m
- Samplers distance:
  - AES-FS, 2.9 km
  - FS-NIM, 86.7 km

Material and methods
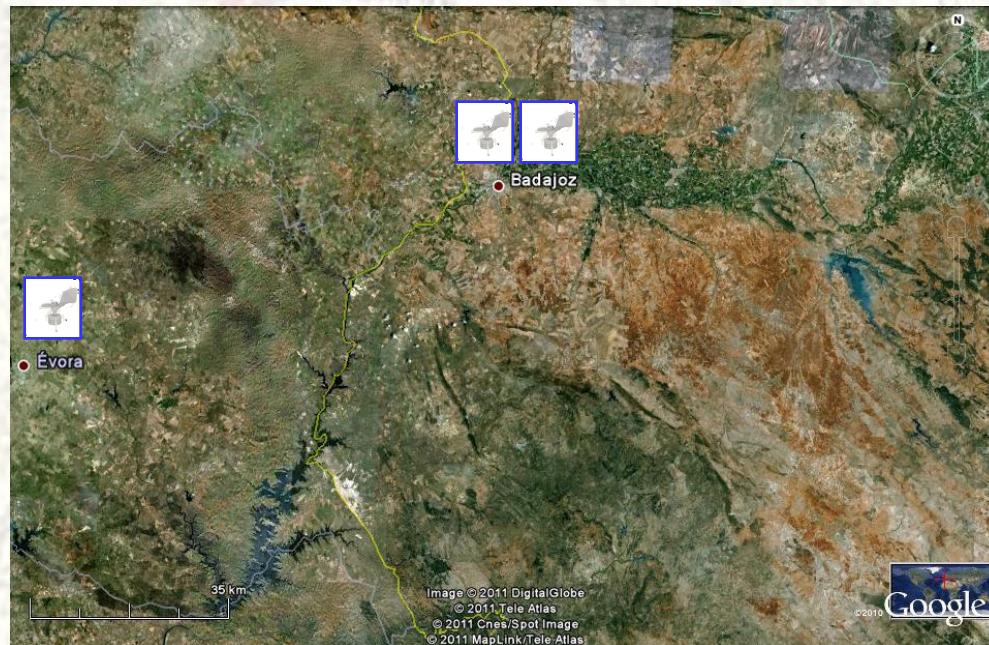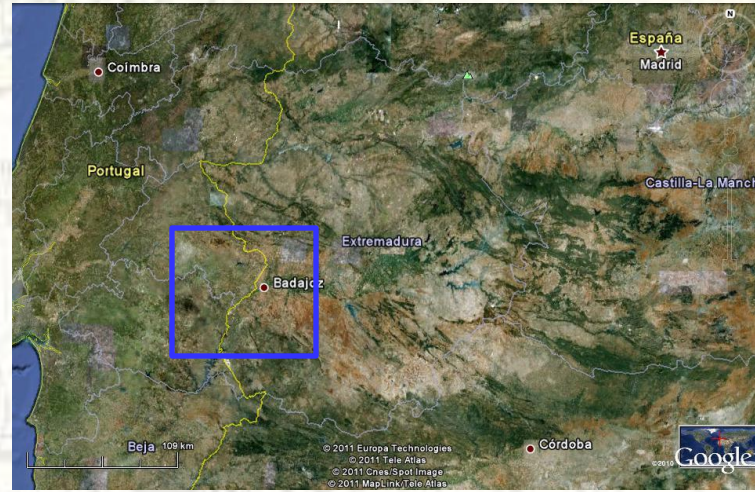
FS

EAS

NIM

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Material and methods

• Daily data did not follow normal distribution, even after logarithmic transformation.

•Wilcoxon ranks test was used to compare

•mean daily pollen counts for the study sites

•Spearman correlation test was used to compare

•pollen concentrations and meteorological parameters:

• solar radiation, temperature

• rainfall, relative humidity

• wind speed

Results

Daily average concentration			(grains/m^3)
2009	Badajoz	FS	282
		AES	260
	Évora	NIM	507
2010	Badajoz	FS	411
		AES	310
	Évora	NIM	681

•**Main pollen types were *Quercus*, *Poaceae* and *Olea*. In Badajoz these pollen types represent 81% and 74% in Évora.**

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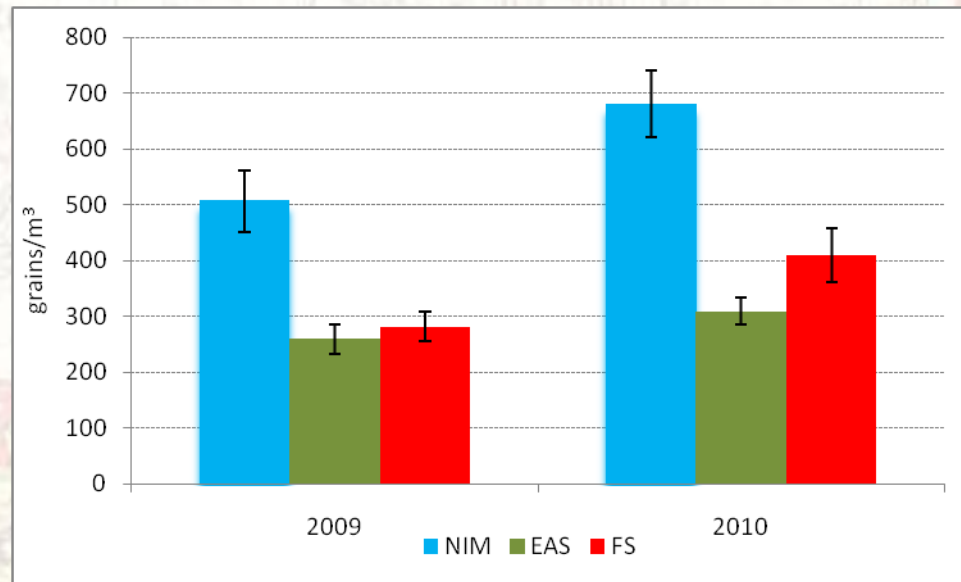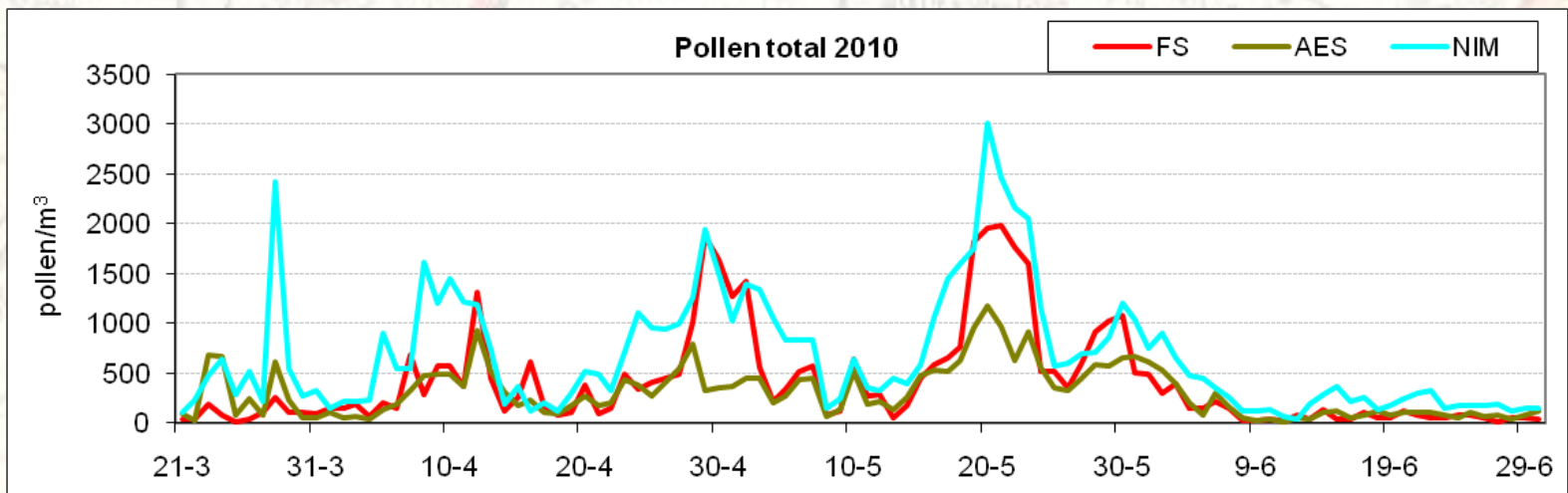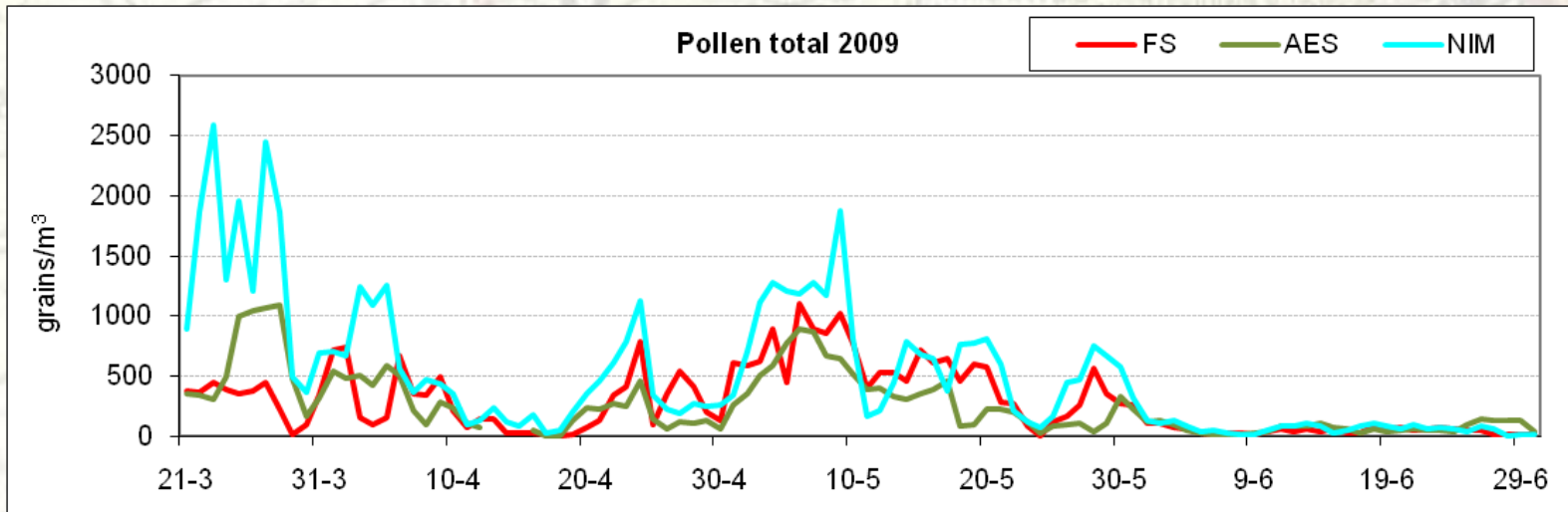
Results

- Spearman correlation coefficient using mean daily pollen total data was statistically significant (in 2009 and 2010) in Badajoz between both sampling sites and between both cities respectively.

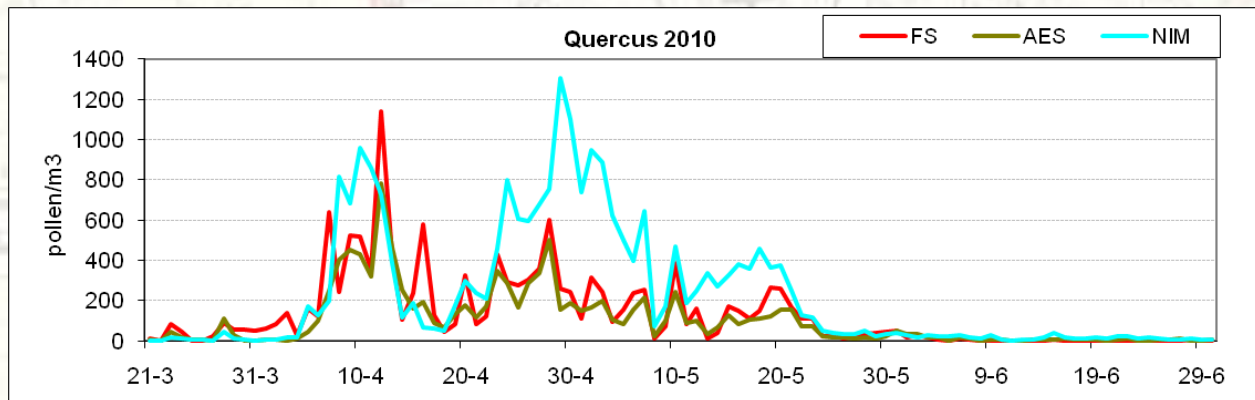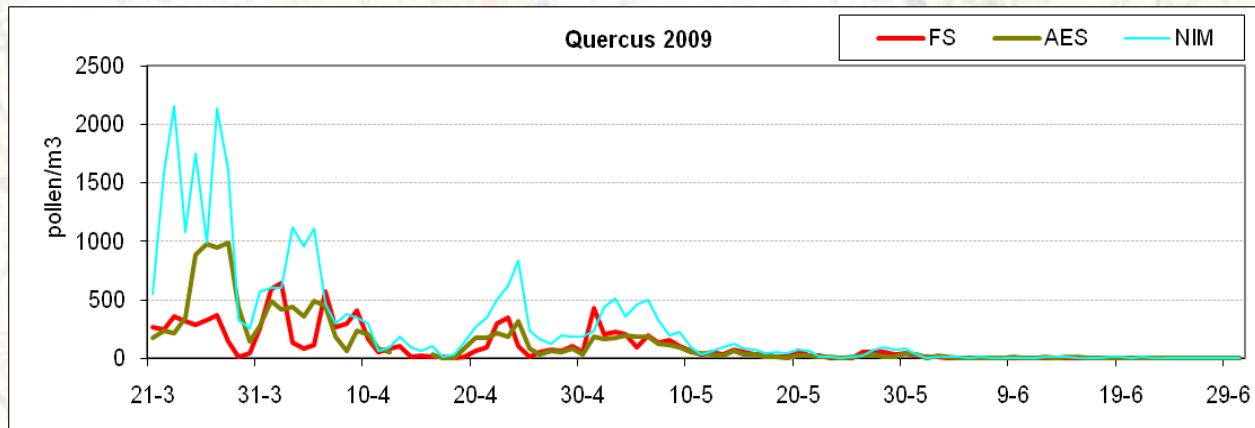|		AES		INM		INM
2009	FS	r= 0,71	FS	r= 0,81	EIA	r= 0,82
		p= 0, 00		p= 0,00		p= 0,00
2010	FS	r = 0,83	FS	r= 0,82	EIA	r= 0,86
		p = 0,00		p= 0,00		p= 0,00

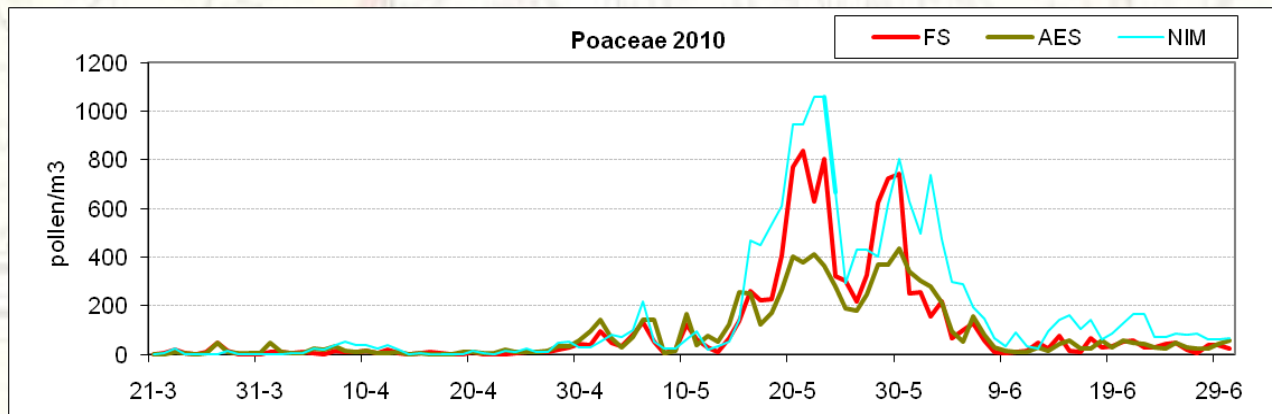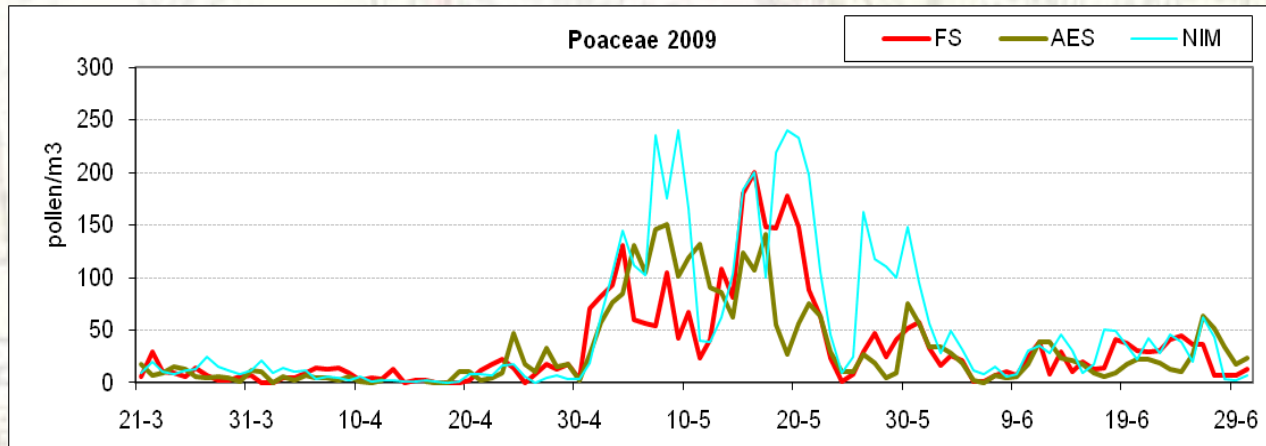In blue; the correlation is significant

Results

Results

• Positive significant correlations were found between both sampling sites in Badajoz and between both cities (in both years) for each type of pollen. (for *Quercus)*

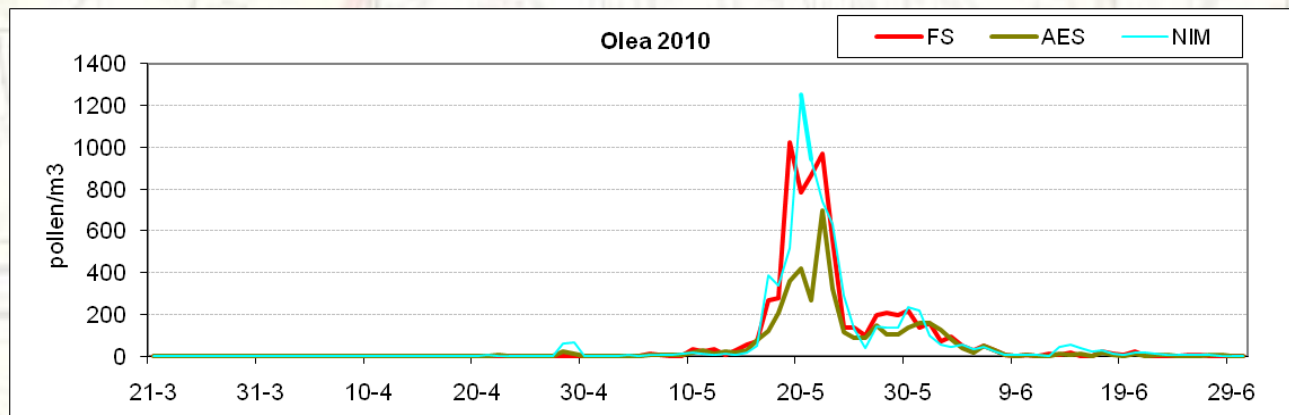Comparison of airborne pollen types in Badajoz (SW Spain) and Évora (SE Portugal)

Results

•for *Poaceae.*

Results

• for *Olea.*
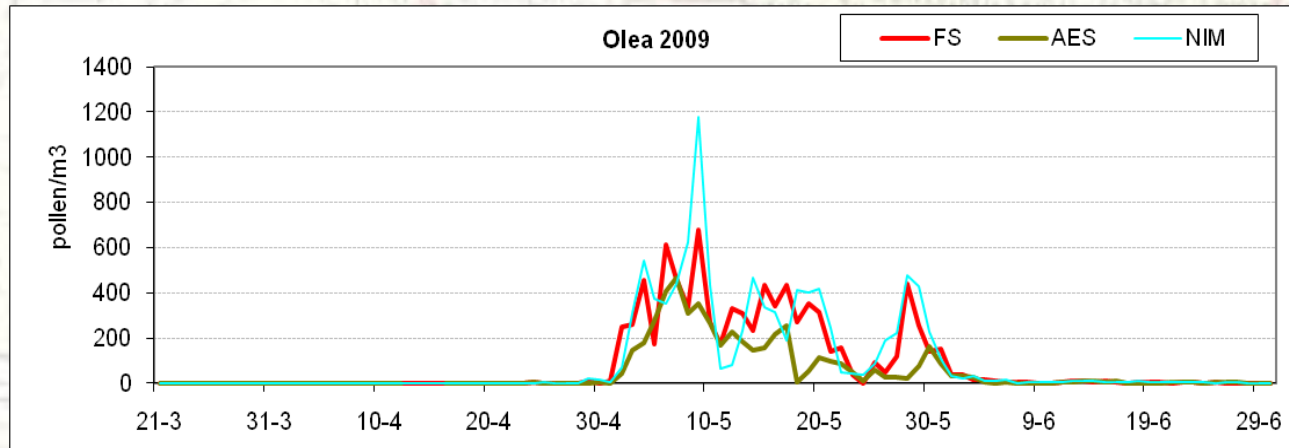
Results

• Wilcoxon ranks test found statistically significant differences between:

• spring 2009 and 2010 (Z -21,38; p-value 0,00)

• two sampling sites of Badajoz and Évora (Z -17,50; p-value 0,00).
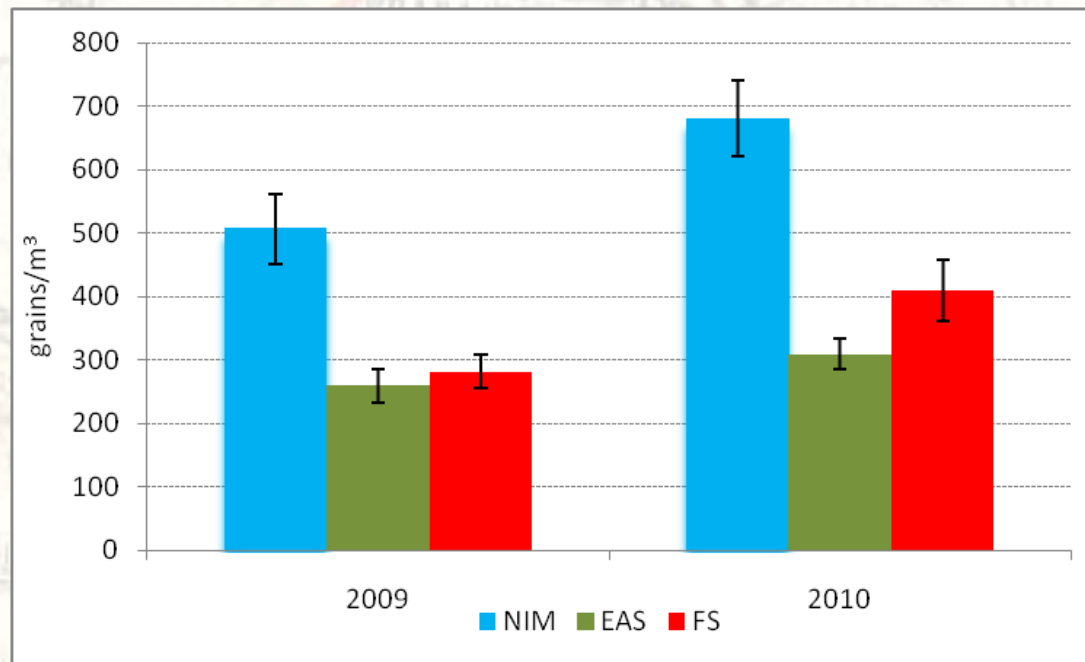
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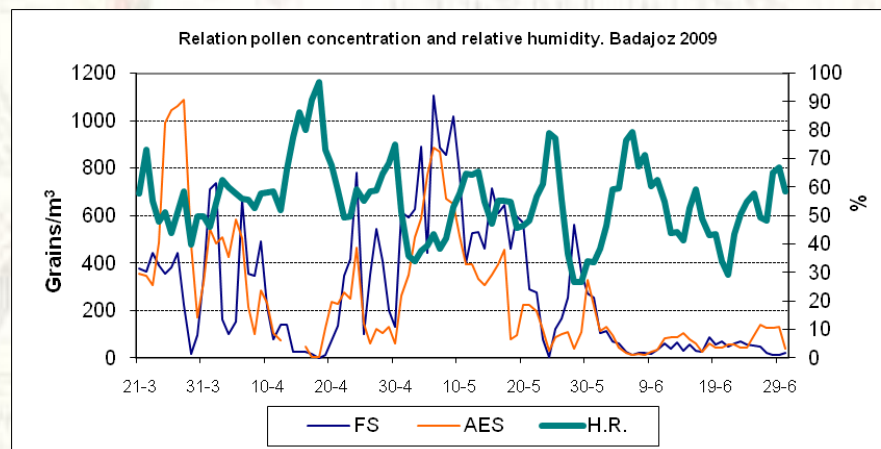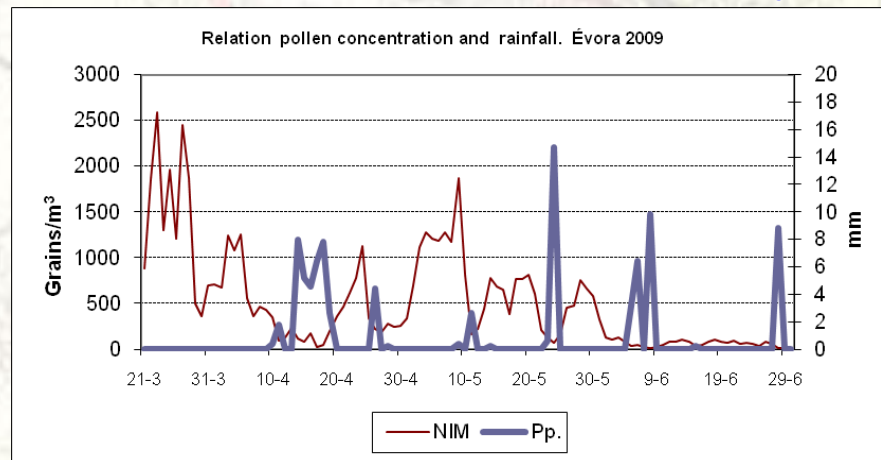
Results

- Spearman correlation test using daily mean total pollen and meteorological data.

- Significant correlations were found between pollen concentration and meteorological parameters in the three sites sampled.

			T air	RH	Rad	Wind speed	Rain
2009	FS	r	-0,082	-0,375	0,091	0,206	-0,414
		p- value	0,410	0,000	0,362	0,038	0,000
	AES	r	-0,223	-0,260	-0,108	0,021	-0,349
		p- value	0,027	0,009	0,287	0,839	0,000
	NIM	r	-0,159	-0,096	0,086	0,346	-0,344
		p- value	0,111	0,336	0,389	0,000	0,000
2010	FS	r	0,095	-0,191	0,194	0,206	-0,281
		p- value	0,949	0,054	0,050	0,038	0,004
	AES	r	0,149	-0,227	0,229	0,047	-0,208
		p- value	0,134	0,022	0,021	0,636	0,036
	NIM	r	0,367	-0,560	0,463	0,240	-0,490
		p- value	0,000	0,000	0,000	0,023	0,000

In blue; the correlation is significant

Results

- Negative significant correlations were found

  - for precipitation and relative humidity

Relation pollen concentration and rainfall. Évora 2009

Relation pollen concentration and relative humidity. Badajoz 2009

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Results

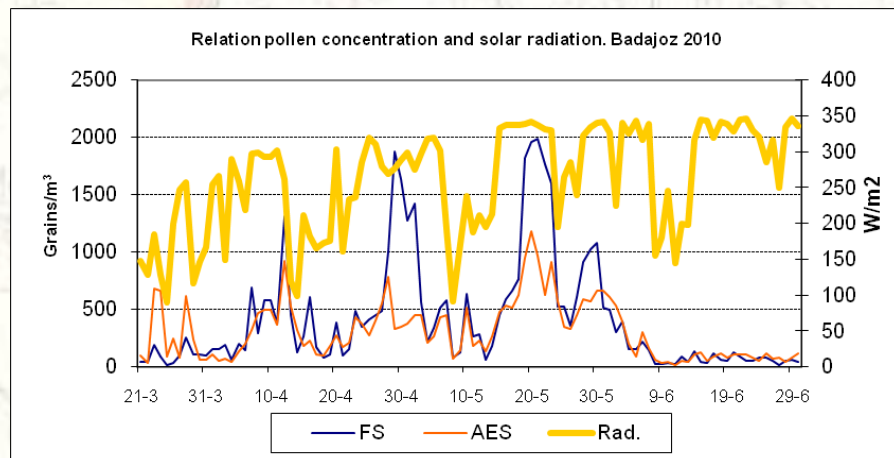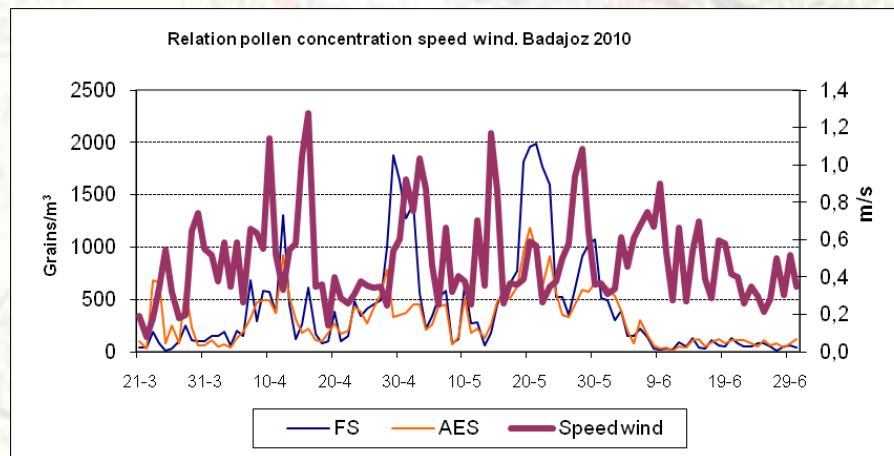- Positive significant correlations were found

  - for speed wind and solar radiation

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Conclusions

- Among the three stations studied there is no difference in the pattern of pollen distribution.
- The main pollen types: *Quercus*, *Poaceae* and *Olea*, showed the same order.
- There is a high level of correlation between the stations with daily pollen data.
- These similarities could be explained by a similar vegetation and climatology at high level.

- Interannual differences could be explained by differences registered in weather between both years.
- The amount of pollen captured showed significant differences between Badajoz and Évora.
- High pollen concentration could be explained by a greater ruralized environment in Évora and the influence of irrigated crops around Badajoz.

Thanks for your attention

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