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AEROBIOLOGICAL MONITORING NETWORK IN EXTREMADURA (SW SPAIN)

Red de monitorización aerobiológica en Extremadura (SO españa)

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PALABRAS CLAVE: aerobiología, Extremadura, red aerobiológica, polen.

It is well known the great utility of aerobiological monitoring networks. These can been set up at different scales: regional, national, and continental. Their aim is to cover the most number of ecological situations, taking into account sources of airborne pollen and spores from vegetation as well as variations in their concentrations with the weather, in order to make accurate forecasts mainly for allergic patients. In Spain, apart from the Spanish aerobiological network (REA), some regional networks have been developed in Andalucía, Cataluña, Madrid, Galicia, Castilla-León, Castilla-La Mancha and Baleares.

Extremadura region is located in the SW of the Iberian Peninsula, with a total surface of 41633 km^2, a North latitudinal range from 37º 57' to 40º 85', which means by 290 km from North to South. The highest mountain peak appears in the north, in the Sistema Central,

with 2401 m (Pico Calvitero, Sierra de Béjar). Extremadura's climate is Mediterranean with hot summers and mild winters. Two main rivers, Guadiana and Tajo, separated by a central mountain range of medium high, run along the two provinces, Badajoz and Cáceres. Natural vegetation includes woodlands of holm oaks *(Quercus rotundifolia)*, cork oaks *(Quercus suber)* and Pyrenean oaks *(Quercus pyrenaica)*. In most cases shrubs were eliminated to create dehesas, mainly of holm oaks. Land uses are mainly for livestock production and free-range grazing, less often cereal, olive and grapevine crops.

Extremadura region has been aerobiologically monitored with volumetric spore traps from 1993 by the aerobiological research unit of the University of Extremadura (aerouex.es). The first monitoring station was placed in Badajoz, and it has been operating continuously since then. In 1995, two new sampling points were established: Cáceres (82.5 km from Badajoz) and Mérida (54 km from Badajoz). The former operated until 2001 and the latter until 1998 (SILVA *et al.*, *Aerobiología en Extremadura. El polen de la atmósfera de la ciudad de Badajoz*. ISBN 84-7723-322-5. 1999; TAVIRA *et al.*, *Aerobiología en Extremadura. El polen en la atmósfera de la ciudad de Cáceres*. ISBN 84-7723-588-0. 2004; MORENO *et al.*, *Aerobiología en Extremadura. El polen en la atmósfera de la ciudad de Mérida*. ISBN: 84-7723-690-9. 2006).

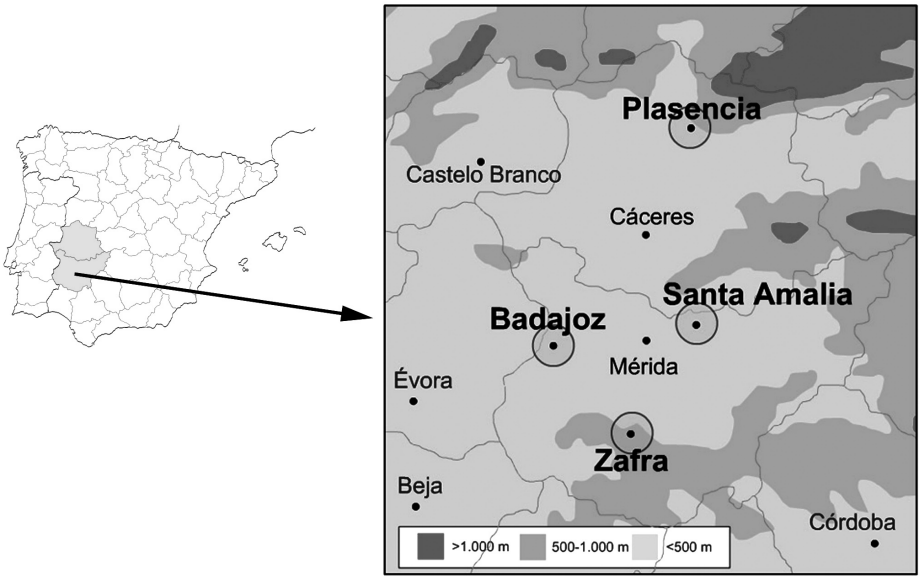

FIGURE 1. Locations aerobiologically studied from the network in Extremadure. Stations working in 2011.

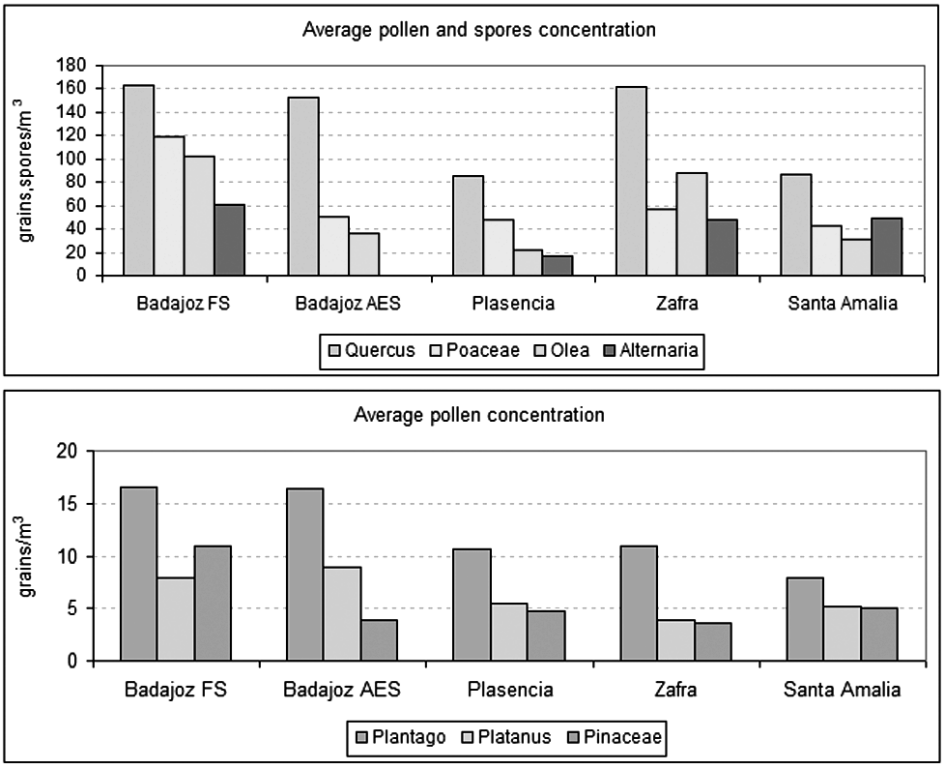

FIGURE 2. Average pollen and spore concentration in the monitored stations in 2011. FS Faculty of Science. AES Agrarian Engineering School.

Three new aerobiological stations have been created in 2011 with funding from the regional government. Plasencia, in the North, 148.3 km from Badajoz, close to the Sistema Central, provides aerobiological information from a more continental area with vegetation dominated by cork and Pyrenean oaks. Santa Amalia, in the West, 84.3 km from Badajoz, close to the Guadiana River with a landscape dominated by irrigated crops and close to holm oak dehesas. Zafra, in the South, 71.3 km from Badajoz, surrounded by olive and grapevine crops. The four aerobiological stations provide more accurate information about airborne pollen and spores in Extremadura region whereas they include the main landscapes (Figure 1).

Results show that aerobiologically Extremadura is characterized by high pollen concentration of grass and oak

pollen, often with the highest values recorded of this pollen types, the first in May and the second in March (Figure 3). Plasencia showed, in general, lower levels of pollen and *Alternaria* spores concentration. Zafra showed higher values of Oleaceae pollen than Poaceae. Plasencia, Zafra and Santa Amalia showed lower values of *Platanus* pollen than Badajoz as a result of lower urban area (Figure 2).

Daily peaks of pollen concentration showed in general a great coincidence, nevertheless depending of the city other peaks were recorded, as *Quercus* in Zafra, Poaceae in Badajoz, Oleaceae and *Alternaria* in Zafra, or even peaks were less evident, as in Plasencia (Figure 3).

In conclusion, the four aerobiological stations provide more accurate information about airborne pollen and spores in Extremadura region whereas they include the main landscapes. Results available so far often show an earlier presence of pollen maximum concentrations in the South, then in the Centre, and finally in the North and East with some days in delay.

ACKNOWLEDGEMENTS

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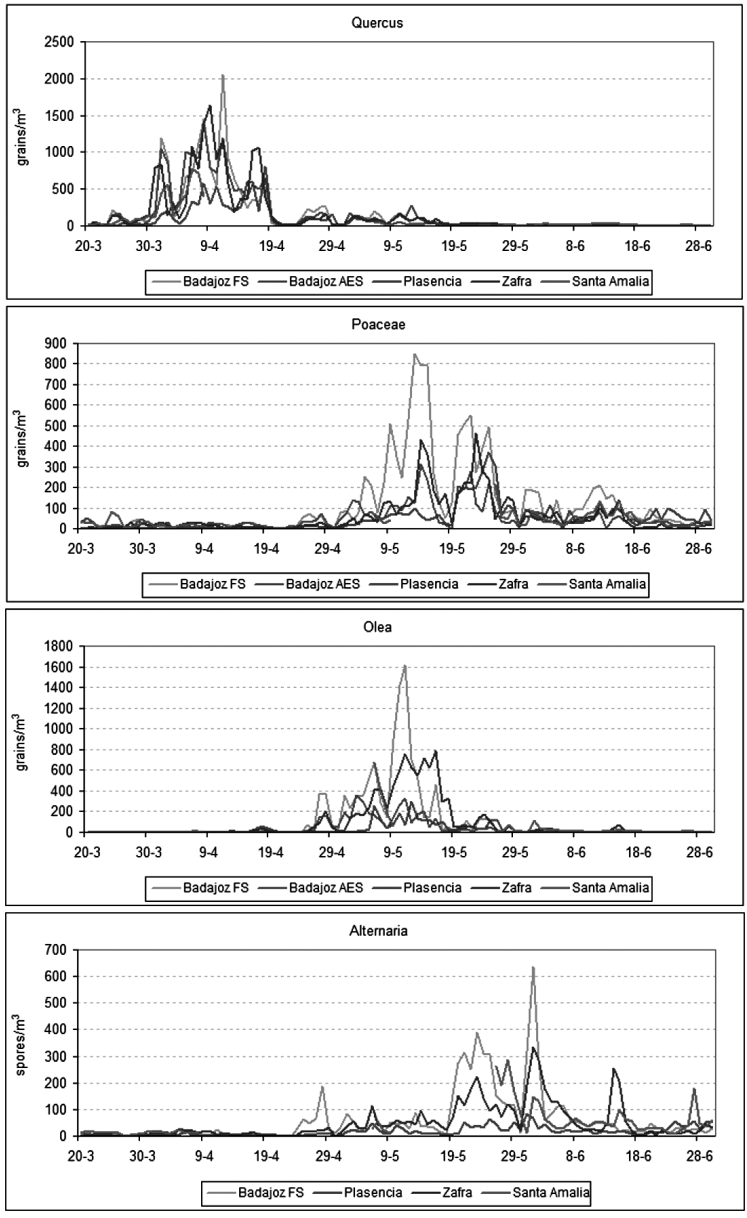

FIGURE 3. Daily concentrations of different pollen and spore types in 2011. FS Faculty of Science. AES Agrarian Engineering School.