

INTRODUCTION

Fungal spores are a fundamental component of the bioaerosol. The genus *Alternaria* Ness. is an Ascomycota fungus that can be found in a wide range of environments, and its spores are often spread through the wind in dry and warm conditions. This genus comprises saprophytic and phytopathogen species, which cause losses in the agricultural sector. Moreover, *Alternaria* spores are catalogued as an important allergen that can trigger respiratory diseases in a share of the population.

Therefore, the aim of this study is to know how the origin of the air masses affects the increase of *Alternaria* spores concentration in the atmosphere of León.

STUDY AREA

The sampling campaign was carried out at the University campus of León (42° 36' N, 05° 35' W and 838 m a.s.l) from 2016 to 2020

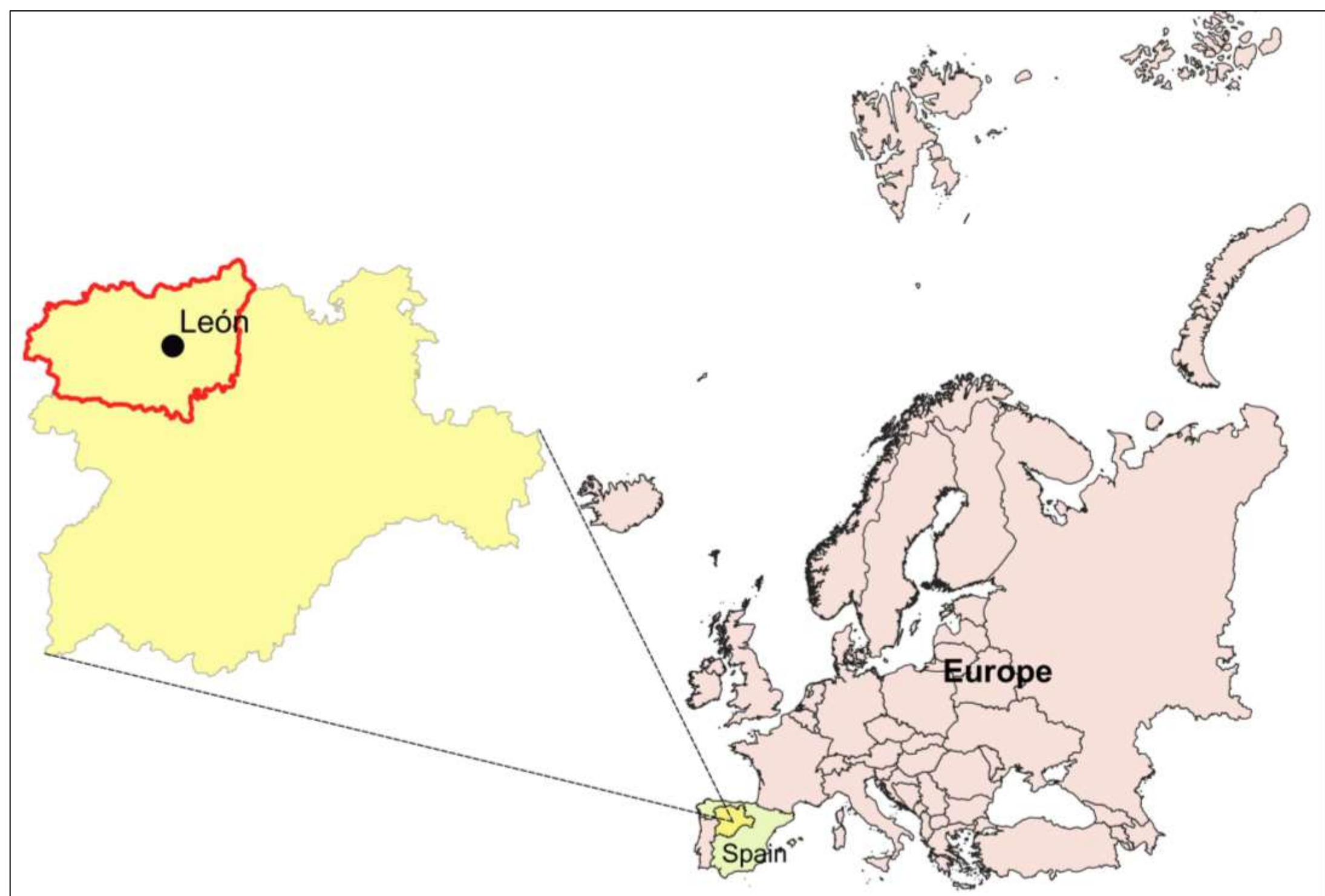


Fig.1. Location of León in Spain. The yellow area corresponds to Castilla y León political region.

METHODOLOGY

Airborne *Alternaria* spore concentration was sampled with a Hirst type volumetric sampler (VPPS2000) following the EN 16868:2019 (CEN, 2019) methodology.

Daily samples were analyzed by means of optical microscopy following the methodology proposed by Galán et al. (2021).



Fig.2. Hirst monitoring sampler.

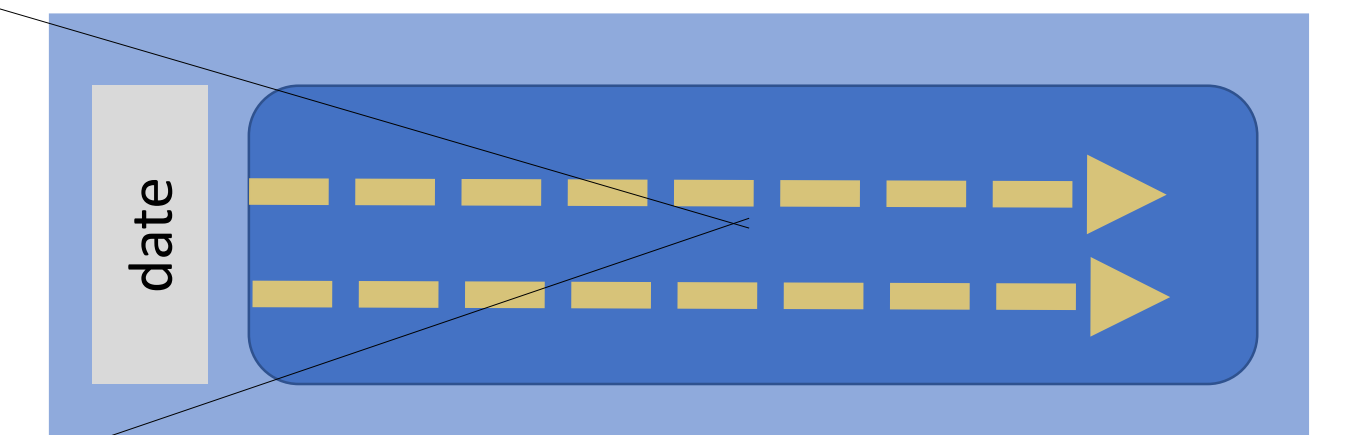
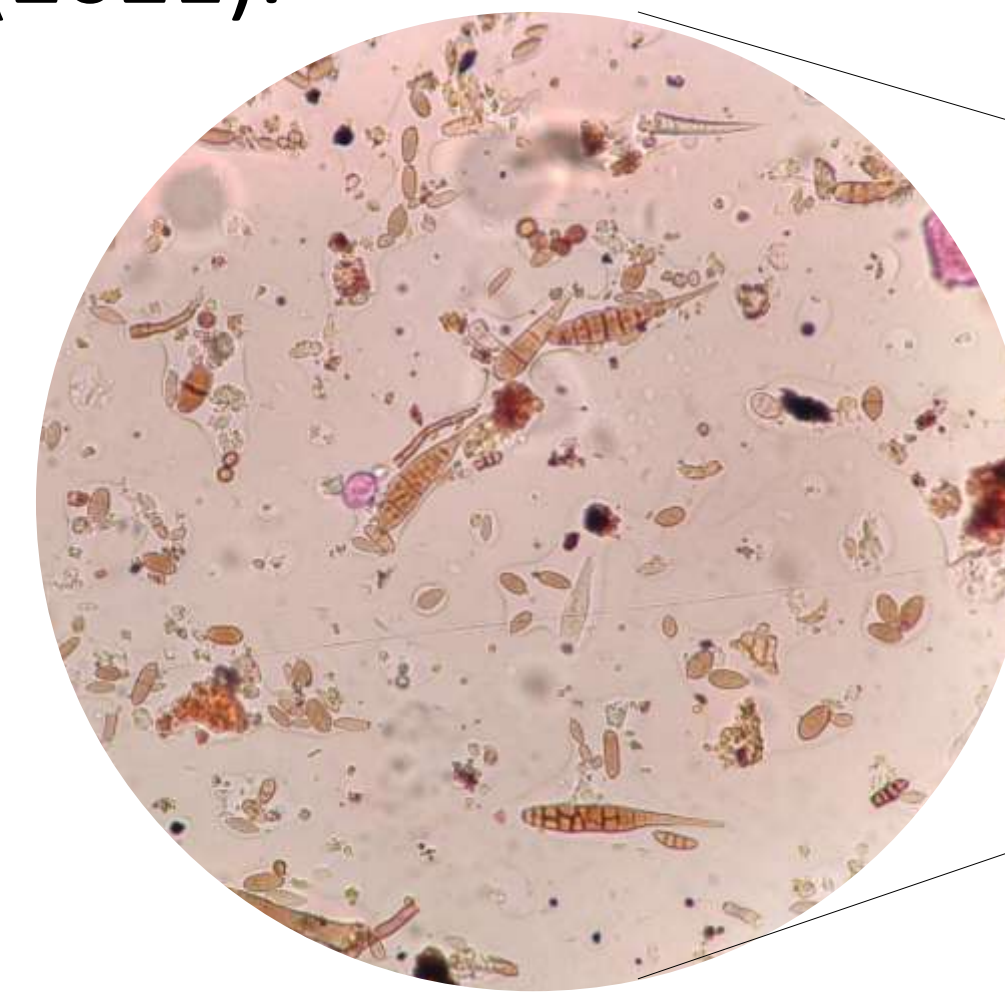


Fig.3. Draft of one sample. 2 sweeps (40x) correspond to 8% of the total sample. On the left image it is shown *Alternaria* spores in an aerobiological sample.

RESULTS AND CONCLUSIONS

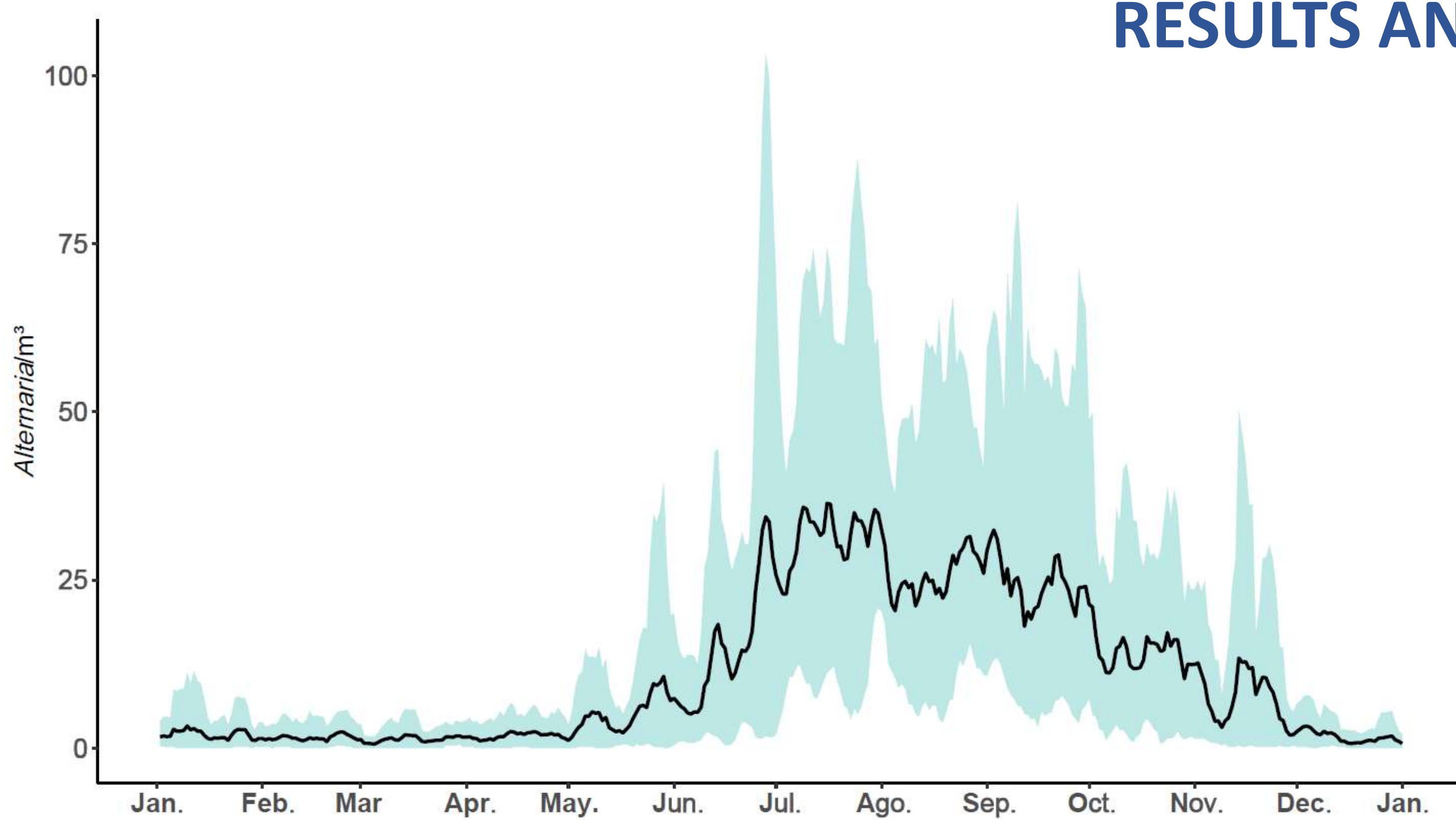


Fig.4. Mean daily concentration result of 5 days moving mean (black line), maximum daily values (blue area) and minimum daily values (white area below blue one) result of moving means during 5 years.

León did not show high airborne *Alternaria* spore concentrations during the analyzed period. Although *Alternaria* spores can appear in any time during the year, its prevalence is greater from May to November due to the influence of the meteorological parameters, mainly the temperature.

The peak days took place when the air mass came from southern continental lands. When the air masses came from arctic region (2016), the lowest value was registered. Air masses in 2017 were favorable but did not show a high concentration. This could be due to the fact that the temperature was still low at that date.

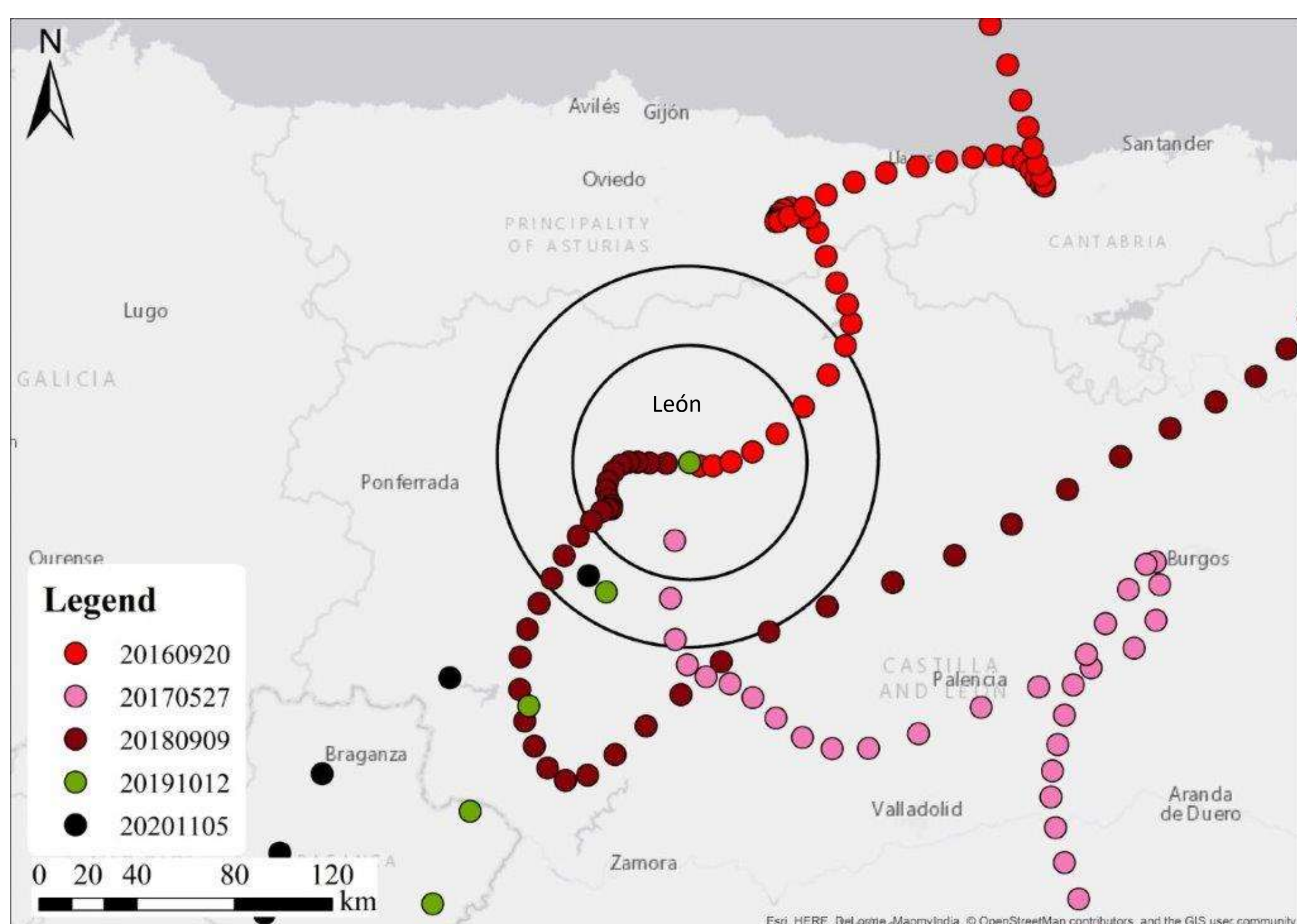


Fig.5. 48-hour back trajectories 200 m a.g.l arriving in León during the days of maximum concentration over the selected period. Each point is 1 hour and the circle indicates 30 and 60 km monitoring station.

Date of peak day	<i>Alternaria</i> /m ³
2016/09/20	70
2017/05/27	74
2018/09/09	155
2019/10/12	120
2020/11/05	118

The highest concentration in 2018 can be due to the air masses coming from a big crop area. Furthermore, both the spreading of the spore and its record by the trap can be facilitated as the number of hours that the air mass stays around the sampling point increase.

León is a semi-urban area where high airborne *Alternaria* spore concentration is not common and days with high concentration did not show a clear pattern among the analyzed years. This is due to the contribution of medium-long distance transport favored by unusual air masses that came from southern locations, where big crop areas can be found.

References

EN 16868, 2019. Ambient air - Sampling and analysis of airborne pollen grains and fungal spores for networks related to allergy - Volumetric Hirst method, CEN.
Galán, C., Smith, M., Damialis, A., Frenguelli, G., Gehrig, R., Grinn-Gofrón, A., Kasprzyk, I., Magyar, D., Oteros, J., Saulienė, I., Thibaudon, M., Sikoparija, B., EAS QC Working Group. (2021) *Aerobiologia*. **37**, 351-361.

Acknowledgments

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