Effect of wind direction in airborne *Alternaria* spore concentration

A. Rodríguez-Fernández[1], C. Blanco-Alegre[2], A.M. Vega-Maray[1], R.M. Valencia-Barrera[1], D. Fernández-González[1,3]

[1]Department of Biodiversity and Environmental Management (Botany), University of León, León, 24071, Spain
[2]Department of Physics, University of León, León, 24071, Spain
[3]Institute of Atmospheric Sciences and Climate-CNR, Bologna, 40129, Italy
Keywords: Aerobiology, *Alternaria*, back-trajectories, spore, transport.
Presenting author email: arodrf@unileon.es

Alternaria genus is an ubiquitous fungus and its spores can be found both in outdoor and indoor air, particularly in temperate regions. Moreover, *Alternaria* is a plant pathogen that can affect many different crops, causing important losses in the agricultural sector. In addition, its spores have a high allergenic capacity that can trigger respiratory diseases in a share of the population. The monitoring of these spores provides information about its airborne behaviour, hence can help to detect earlier plant infections and prevent respiratory allergic diseases.

The aim of this study was to know how the origin of air masses affects the increase of *Alternaria* spore concentration in the atmosphere.

Sampling campaign was carried out in León (Spain) from January 2016 to December 2020 using a volumetric Hirst type spore-traps Lanzoni VPPS 2000. The samples were prepared by the method proposed by CEN Ref. No. EN 16868:2019 and the spore counting was done following the method proposed by Galán *et al*. (2021). The selected events were the day of maximum concentration (peak day) of each year. Based on three-day back trajectories at 200 m a.g.l., air masses during the selected events were characterized using the NOAA HYSPLIT 4 model. The air mass origin was stablished following the classification proposed by Blanco-Alegre *et al*. (2019).

The behaviour of airborne *Alternaria* conidia did not show a clear trend during the selected period, occurring the peak days at different seasons each year (Table 1). Likewise, maximum concentrations varied among years, being 2016 and 2017 the years that showed the lowest concentrations (70 and 74 spores/m^3 respectively). The remaining years presented concentrations above 100 spores/m^3, being 2018 the one with the highest value (155 spores/m^3).

Table 1. Days of maximum *Alternaria* spores concentration in León during the sampled period.

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

The analysis of back trajectories (Figure 1) showed that most peak days took place when the air mass came from southern continental lands (group VI in the classification). However, when the air masses came from Artic region, the lowest peak value was registered (2016). On the other hand, although air masses in 2017 were favourable (group VI), it did not present a high concentration. The highest concentration in 2018 can be due to the direction of the air mass on the preceding day, which came directly from a big crop area near the city after spending a long period of time in southern continental lands.

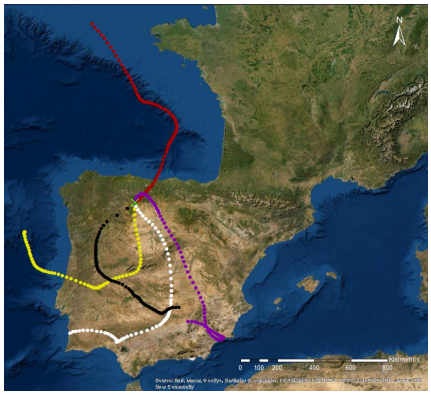

Figure 1. Three-days back trajectories arriving 200 m a.g.l. during the days of maximum concentration over the selected period. (-) 2016, (-) 2017, (-) 2018, (-) 2019, (-) 2020, (x) León.

The authors are grateful to the Castilla y León Government's Health Department for funding the RACYL. A. Rodríguez-Fernández acknowledges the Orden EDU/601/2020 grant from the Junta de Castilla y León, co-financed with European FEDER funds.

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