

Long-term trend in phenology revealed by aerobiological monitoring data over a time series of 20 years in Trentino, Italy

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Aerobiological monitoring is generally focussed on supporting alert systems for allergic patients; due to the characteristics of this long term ecological study, surveyed pollen data may also be exploited in the field of environmental research. The assessment of pollen dispersion in the atmosphere can, indeed, be an effective indicator of plant distribution and phenological stage. Due to the high quality of the input data, the time series collected by the IASMA Research and Innovation Centre of the Fondazione Edmund Mach over a period of 20 years provides the basis for developing research through the study of spatial and temporal changes in the spread of pollens.

Airborne pollen was collected over the years 1989–2008, using a Hirst-type volumetric trap situated in San Michele all'Adige, Trento, Italy (227 m a.s.l.; 46°11'51" N, 11°07'15" E) at a height of 10 m above ground. Daily average concentrations of pollens were obtained applying a standard method published by the Italian Organization for Standardization (in Italian: UNI 11108:2004, www.uni.com).

First explorative analyses on the data collected in Trentino, North Italy, show changes in the spectrum of pollen composition, both in terms of surveyed pollen species and in terms of percentage contribution of the different taxa. A trend to an increase in the total amount of dispersed pollen has been evidenced. Furthermore, pollen seasons tend to last longer, with an earlier start and a later end.

Trends in phenological development, pollen production and plant distribution were revealed by long-term studies in the aerobiological field. Traced modifications could be attributed both to anthropic activities, which may change the pattern in plant distribution and to the rise in mean temperatures as an effect of ongoing climate changes, which may have contributed both to increase the total amount of pollen and to lengthen the flowering seasons.



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