

# ABSTRACT BOOK

13<sup>th</sup>-15<sup>th</sup> SEPTEMBER 2022

## 5<sup>th</sup> MEDPALYNOS SYMPOSIUM

Scientific Responsible:  
Prof.ssa A.M. Mercuri  
Prof.ssa E. Tedeschini

15<sup>th</sup>-18<sup>th</sup> SEPTEMBER 2022

## 16<sup>th</sup> AIA CONGRESS ITALIAN SOCIETY OF AEROBIOLOGY ENVIRONMENT AND MEDICINE

“AEROBIOLOGIA 4.0”

Scientific Responsible:  
Prof. V. Patella  
Prof.ssa E. Tedeschini

# ONE HEALTH

PAESTUM

20  
22



One Health Paestum 2022  
5th MedPalyos Symposium.  
16th AIA Congress (Italian Society of Aerobiology Environment and Medicine) “Aerobiologia4.0”  
Abstracts Book Editors: Travaglini Alessandro, De Franco Denise & AIA

© Author’s texts  
ISBN: 978-88-900277 (e-Book)  
Available in: <https://eventi.infomed-online.it/one-health-2022/>

Suggestion for citation:

Entire volume:  
Travaglini A. & De Franco D. (Eds.). 2022. 5th MedPalyos Symposium 16th AIA Congress. Abstracts Book.  
Firenze, Italy. ISBN 978-88-900277.



**KEY WORDS: CAMBIAMENTO CLIMATICO VEGETAZIONE,  
RISCHIO AMBIENTALE E RISCHIO ALLERGOLOGICO**

---

## INCREASE IN POLLEN QUANTITIES THE MOST EVIDENT SIGNAL IN 30 YEARS OF DATA IN ALPINE CONTEXT

---

Fabiana CRISTOFOLINI <sup>1</sup>, Antonella CRISTOFORI <sup>2</sup>, Elena GOTTARDINI <sup>3</sup>

<sup>1</sup> *Research and Innovation Centre, Fondazione E.Mach, fabiana.cristofolini@fmach.it*

<sup>2</sup> *Research and Innovation Centre, Fondazione E.Mach, antonella.cristofori@fmach.it*

<sup>3</sup> *Research and Innovation Centre, Fondazione E.Mach, elena.gottardini@fmach.it*

### Introduction

The ongoing changes in climate have wide-range impacts on ecosystems and human health. One of the verified impacts of climate change on plants affects the phenology of flowering, and pollen release. The analysis of pollen trends often highlights changes in quantity and seasonality and underlines the role of temperature and precipitation (Schramm 2021). The study of pollen and its changes is important also for the allergenicity of many airborne pollens; the prevalence of pollen allergy is currently estimated to be up to 40% at European level (D'Amato 2007).

### Materials and Methods

The modifications of airborne pollen were analyzed on 30 years (1989-2018) of daily data collected at Fondazione E. Mach in San Michele all'Adige (Latitude 46.19 N, Longitude 11.13 E, 220 m a.s.l.). Airborne pollen was sampled by a Hirst-type trap, processed, and analyzed following conventional techniques and standardized protocols (UNI EN 16868:2019). Seasonal indicators were calculated for 24 pollen taxa (16 arboreal, AP, and 8 non arboreal (NAP) pollen taxa), representing 95% of the entire spectrum. Time trends and correlation to the meteorological parameters were analyzed. To minimize the effect of interannual fluctuations in pollen production and to maximize relevant changes during the timespan, total pollen and number of high pollen days (number of granules/m<sup>3</sup> >100) were analyzed, clustering arboreal (AP) and non-arboreal pollen (NAP) in three decadal blocks.

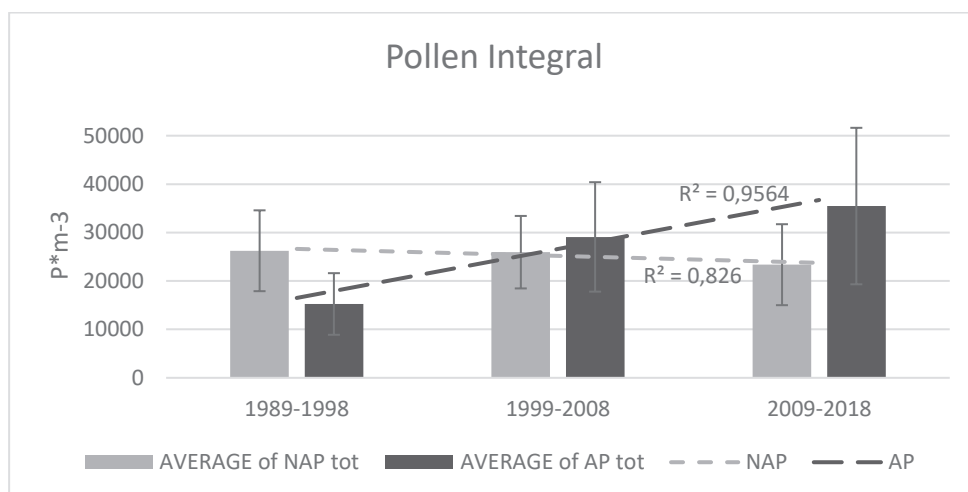
### Results and Discussion

The most evident and coherent signal is the increase in peak and total pollen, mainly ascribable to AP. The analysis in three decadal blocks shows that the increase in pollen load (figure) and number of high pollen days are significant. As for seasonal descriptors, an anticipation of the start date, mainly for herbaceous taxa (NAP) is recorded. On average, start date shows a trend of advance of 2,8 days

every 10 years. Correlations with meteorological parameters are more frequent with AP seasonal descriptors than pollen load (in agreement with Schramm et al. 2021).

## Conclusions

Our thirty-year pollen analysis shows a significant earlier start date, especially for NAP, and a significant increase in pollen load for AP. Our case study in the Alpine biogeographical region is consistent with findings for other geographical areas and time spans. Temperature is the meteorological descriptor mainly related with changes in seasonal descriptors. The increase in pollen quantities, not consequent to land use changes at our site, may be read in a context of global change, where the increase in CO<sub>2</sub> can play a relevant role. Detrimental effects on human health may result from pollen load changes, observed in the past decades or happening in the future.



## References

D'Amato, G., Cecchi, L., Bonini, S., Nunes, C., Annesi-Maesano, I., Behrendt, H., Liccardi, G., Popov, T., and van Cauwenberge, P. 2007. Allergenic pollen and pollen allergy in Europe [Review]. *Allergy* 62(9): 976-990. doi:10.1111/j.1398-9995.2007.01393.x.

Schramm, P.J., Brown, C.L., Saha, S., Conlon, K.C., Manangan, A.P., Bell, J.E., and Hess, J.J. 2021. A systematic review of the effects of temperature and precipitation on pollen concentrations and season timing, and implications for human health. *International Journal of Biometeorology* 65(10): 1615-1628. doi:10.1007/s00484-021-02128-7.

## Acknowledgements (Funds)

We are gratefully to Stefano Corradini and Fabio Zottele (FEM Technology Transfer Centre) for the provision of meteorological data.