Climatic Influence on Pollen and Fungal Spore Variability: A Correlation Analysis

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Rationale

Understanding the relationship between pollen and fungal spores concentration, and climatic variables, including temperature and precipitation, is crucial for predicting exposure to allergenic pollen and spores.

Aim

Determine the influence of climatic variables on pollen and spores concentrations

Methods

Samples were collected at our NAB-certified aerobiological station using a Burkard spore trap following NAB guidelines for collection and identification. The stattion is located at a urban parrish (La Puntilla) in the coastal reigon of Ecuador. Climatic variables were obtained from a weather forecasting website (Meteoblue). Maximum and minimum temperatures, and precipitation were included. Pollen and spores concentration were represented in the form of DPC (pollen grains/m3) and DFC (spores/m3). A Pearson correlation analysis was conducted using daily and monthly data for specific pollen species (e.g., Acacia, Moraceae, Pinaceae) and fungal spores (e.g., Agrocybe).

Results

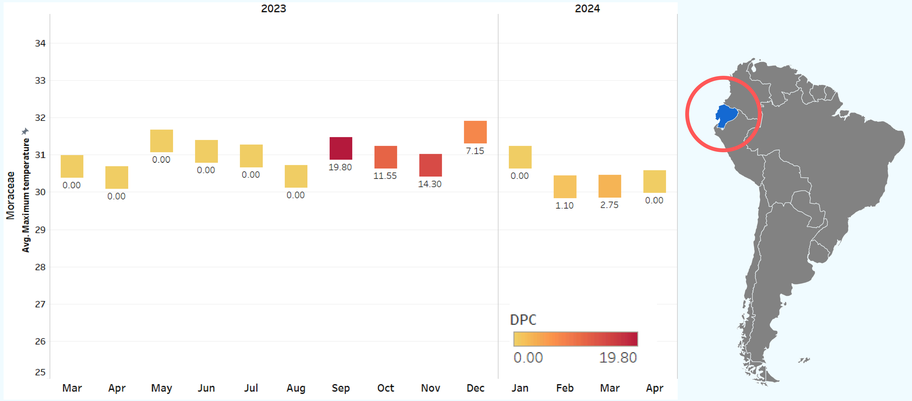

Fig 1. Correlation between *Moraceae* pollen (pollen grains/m3) expressed in monthly sums of daily pollen concentrations (DPC) and precipitation (mm).

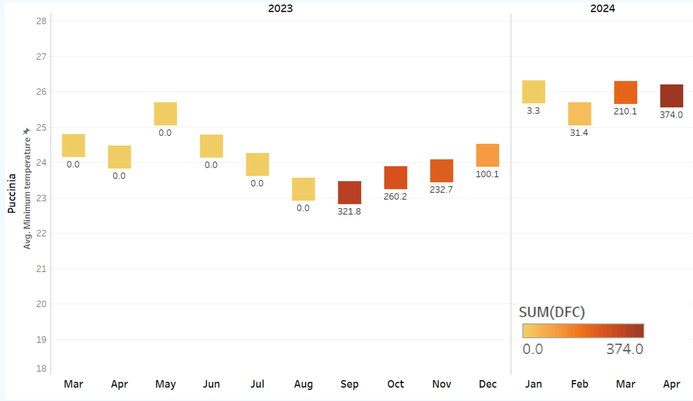

Fig 2. Correlation between *Puccinia* spores (spores/m3) expressed as the monthly sum of daily spores concentration (DFC) and minimum temperature (C°).

Arboreal Pollen

Temperature → ***Moraceae*** → Showed a weak positive correlation with maximum temperature (r = 0.1420, p =0.0205) and a weak negative correlation with minimum temperature (r = -0.2017, p = 0.0009)

Herbaceaous Pollen

Precipitation → ***Peperomia cf.*** → Showed a strong positive correlation with monthly precipitation totals (r = 0.8656, p = 0.0001)

Spores

Temperature → ***Agrocybe*** → Showed weak negative correlation with minimum temperature (r = -0.1767, p = 0.0038)

Temperature → ***Puccinia*** → Showed weak negative correlation with minimum temperature (r = -0.2454, p = 0.0001)

Conclusion

Climatic variables, particularly temperature and precipitation, have varying degrees of influence on pollen and spore counts. Five-year-continuous pollen sampling will allow us to construct a pollen calendar that will help build predictive models and public health interventions to manage pollen and spore-related health risks.