

# How does aerobiology behave in a neotropical city?

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## Introduction

Aerobiology in tropical regions is a developing field requiring extensive sampling and analysis to comprehend its dynamics. This study investigated airborne pollen in Medellín, Colombia.

## Methods

Airborne pollen was collected using a Hirst-type sampler between 2019 and 2022, following European Aerobiology Society guidelines. Spearman correlations between pollen and meteorological/air pollution data were performed.

## Results

Pollen grains were detected on all sampling days. A total of 26 pollen types were identified, with *Cecropia* (44%) being the most abundant, followed by Urticaceae (20%), *Fraxinus* (9%), Moraceae (8%), Cupressaceae (7%), Myrtaceae (2%), and *Pinus* (1%).

## Discussion

This study reveals surprisingly high airborne pollen concentrations in a tropical city (Medellín, Colombia), exceeding previous reports and matching those found in temperate regions. Notably, pollen was present year-round, consistent with tropical patterns, with peaks following rainy periods. Meteorological factors significantly influenced pollen levels, with temperature, wind speed, and PM10 positively correlated, while relative humidity, rainfall, PM2.5, and NOx showed negative correlations.

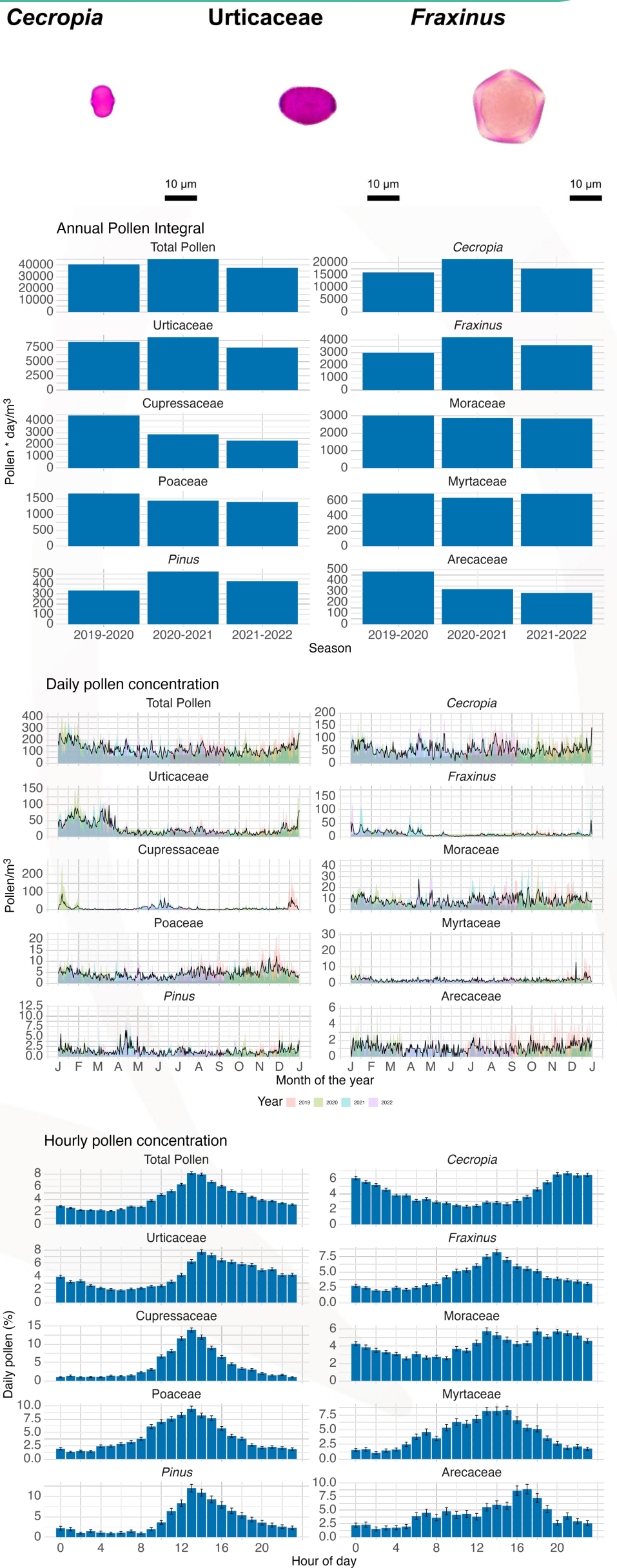


Table 1. The Spearman correlation coefficient between daily mean pollen concentration and the meteorological parameters and atmospheric pollutants. Significance levels  $p \leq 0.05$  (\*),  $p \leq 0.01$  (\*\*),  $p \leq 0.001$  (\*\*\*)

	Humidity (%)	Rainfall (mm)	Temperature (°C)			Wind Speed (m/s)		PM2.5 (µg/m³)	PM10 (µg/m³)	NO (ppb)	NO2 (ppb)	NOx (ppb)
			Maximum	Mean	Minimum	Maximum	Mean					
Arecaceae	-0.357***	-0.297***	0.265***	0.324***	0.223***	0.216***	0.320***	-0.025	0.238***	-0.032	-0.088	-0.051
<i>Cecropia</i>	-0.540***	-0.485***	0.412***	0.551***	0.400***	0.208***	0.433***	-0.225***	-0.017	-0.223***	-0.310***	-0.276***
Cupressaceae	-0.295***	-0.231***	0.338***	0.335***	0.145***	0.096	0.209***	-0.240***	-0.065	-0.075	-0.226***	-0.148***
<i>Fraxinus</i>	-0.397***	-0.393***	0.274***	0.364***	0.250***	0.279***	0.425***	0.029	0.235***	-0.184***	-0.189***	-0.210***
Moraceae	-0.631***	-0.558***	0.479***	0.637***	0.412***	0.281***	0.570***	-0.121*	0.118*	-0.216***	-0.171***	-0.226***
Myrtaceae	-0.267***	-0.248***	0.248***	0.251***	0.122*	0.136**	0.183***	-0.085	0.074	-0.060	-0.081	-0.083
<i>Pinus</i>	-0.411***	-0.353***	0.388***	0.423***	0.211***	0.198***	0.320***	-0.163***	0.005	-0.215***	-0.268***	-0.264***
Poaceae	-0.551***	-0.466***	0.438***	0.533***	0.310***	0.258***	0.496***	-0.146***	0.161***	-0.073	-0.129**	-0.105
Urticaceae	-0.498***	-0.473***	0.325***	0.446***	0.268***	0.281***	0.519***	0.026	0.253***	-0.192***	-0.215***	-0.228***
Total Pollen	-0.664***	-0.617***	0.496***	0.640***	0.416***	0.323***	0.600***	-0.140**	0.171***	-0.249***	-0.311***	-0.302***