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## Seasonal and Diurnal Patterns of Pollens and Their Relations with Asthma and Allergies

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# Seasonal and Diurnal Patterns of Pollens and Their Relations with Asthma and Allergies\*

Jeremy Rivera Sánchez and Benjamin Bolaños Rosero, PhD

## Abstract

According to the CDC, 22.4% of the population in Puerto Rico suffers from asthma, increasing in children to a 25.3%. Allergic asthma is a respiratory condition caused by allergens such as mite- dust, fungal spores, and pollen. Asthma symptoms can include lack of air and chronic cough. Biological airborne particles may produce proteins with allergenic potential that at high levels may trigger asthma in susceptible individuals.

To determine the role of tree pollen in asthma, we analyzed the daily data collected from 2015 to 2017 with a Burkard volumetric air sampler located 73 meters above sea level at the San Juan (SJ) Station of the American Academy of Allergy Asthma and Immunology. With the meteorological factors obtained from the Airport Station of National Weather Service in SJ we determined that the tree pollens are present during the dry season (January-March), decrease during the summer and re-appears during the rainy season (September-November). Diurnal variation of *Cecropia scheberiana*, the most common tree pollen in Puerto Rico (PR), presents highest levels of pollen at night and lower during the day. Therefore, like fungal spores, tree-pollen in PR has a circadian rhythm with low concentrations during the day and higher at night.

This investigation will have an important impact on the management of asthma as the exposure to pollen and fungal spores can be prevented using a HEPA filter air purifier. Also there will be no need to restrict children indoors during the day as the pollen and spores are at low concentrations.

**KEYWORDS:** Pollen; Diurnal Variation; Allergens; Asthma; Weather

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### **ABSTRACT**

According to the CDC, 22.4% of the population in Puerto Rico suffers from asthma, increasing in children to a 25.3%. Allergic asthma is a respiratory condition caused by allergens such as mite- dust, fungal spores, and pollen. Asthma symptoms can include lack of air and chronic cough. Biological airborne particles may produce proteins with allergenic potential that at high levels may trigger asthma in susceptible individuals.

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