

# Predicting the Main Pollen Season of *Broussonetia papyrifera* (Paper mulberry) Tree in Islamabad, Pakistan

Ahmad Kakakhail<sup>1</sup>, Aimal Rextin<sup>2</sup>, Jeroen Buters<sup>3</sup>, Chun Lin<sup>4</sup>, Jose Maria Maya Manzano<sup>3</sup>, Mehwish Nasim<sup>2</sup>, Jose Oteros<sup>5</sup>, Antonio Picornell<sup>6</sup>, Hilary Pinnock<sup>4</sup>, Jürgen Schwarze<sup>4</sup>, and Osman Yusuf<sup>2</sup>

<sup>1</sup>National University of Modern Languages

<sup>2</sup>Allergy & Asthma Institute

<sup>3</sup>Technische Universität München

<sup>4</sup>The University of Edinburgh

<sup>5</sup>Universidad de Córdoba

<sup>6</sup>University of Málaga

February 7, 2023

## Abstract

Paper mulberry pollens are known to trigger severe allergies that can also cause asthma exacerbations. In Islamabad, the paper mulberry pollen concentrations are thought to peak between the 10th and 31st of March each year, depending on the weather in the preceding months. However, more accurate prediction of high pollen days would allow patients to take more timely precautionary measures. We developed and validated two prediction algorithms that took historical pollen data and historical weather data in Islamabad as its input. One is based on linear regression and the other is based on phenological modelling. These algorithms gave encouraging results where the mean absolute error for start day was between 2.33 and 3.67 days. On the other hand, for peak day, the mean absolute error was recorded between 3.33 and 4 days. These results could be used in a website or app to notify patients and healthcare providers to start preparing for the paper mulberry pollen season and its adverse effects.

## Hosted file

Predicting MPS of Paper Mulberry in Islamabad, Pakistan - Copy.docx available at <https://authorea.com/users/583560/articles/623126-predicting-the-main-pollen-season-of-broussonetia-papyrifera-paper-mulberry-tree-in-islamabad-pakistan>