

Abstract:

Chemical and molecular characterization of primary biogenic aerosol particles from different air masses in the Caribbean

Primary biogenic aerosols particles (**PBAPs**) are a mixture of microorganisms like pollen, algae, bacteria, fungal spores and hyphal fragments, yeasts and viruses as well as fragments of plants and animals. PBAPs are ubiquitous and play an important role in the chemistry and physics of the atmosphere, climate, and public health. They have been associated with the spread of biological organisms and reproductive materials that can cause or enhance human, plant and animal diseases or allergies. My doctoral thesis project focused on the chemical and molecular characterization of PBAPs with a special attention on fungi in the presence and absence of African Dust (AD) incursions in the Caribbean region. Fungal spores can be toxigenic, allergenic and/or infectious to human exposure resulting in a variety of adverse health effects that could include respiratory problems, allergies and infectious diseases among others. On the other hand, an increase in particulate matter (PM 10), considering one of the six National Ambient Air Quality Standard (NAAQS) monitored by the EPA, and by consequence a detrimental increase in the air quality have been reported during AD incursions at the Caribbean region and have been associated with an increase in respiratory problems as for example asthma. The origin, abundance, and characterization of PBAPs, especially fungal spores, are still poorly understood and quantified. At the same time there is no information about the relation between fungal spores' concentrations and the incursions of AD. For that reason, *the goal of this study is to gain a better understanding of the chemical and molecular composition of PBAPs, focusing on fungal spores, and the contribution of these particles to the total aerosol mass in the Caribbean island of Puerto Rico in the presence and absence of African Dust incursions.*