

Characteristics and determinants of ambient fungal spores in Hualien, Taiwan

趙馨

Ho HM;Rao CY;Hsu HH;Chiu YH;Chao HJ

Abstract

Characteristics and determinants of ambient aeroallergens are of much concern in recent years because of the apparent health impacts of allergens. Yet relatively little is known about the complex behaviors of ambient aeroallergens. To address this issue, we monitored ambient fungal spores in Hualien, Taiwan from 1993-1996 to examine the compositions and temporal variations of fungi, and to evaluate possible determinants. We used a Burkard seven-day volumetric spore trap to collect daily fungal spores. Air pollutants, meteorological factors, and Asian dust events were included in the statistical analyses to predict fungal levels. We found that the most dominant fungal categories were ascospores, followed by *Cladosporium* and *Aspergillus/Penicillium*. The majority of the fungal categories had significant diurnal and seasonal variations. Total fungi, *Cladosporium*, *Ganoderma*, *Arthrinium/Papularia*, *Cercospora*, *Periconia*, *Alternaria*, *Botrytis*, and PM10 had significantly higher concentrations ($p < 0.05$) during the period affected by Asian dust events. In multiple regression models, we found that temperature was consistently and positively associated with fungal concentrations. Other factors correlated with fungal concentrations included ozone, particulate matters with an aerodynamic diameter less than 10 μm (PM10), relative humidity, rainfall, atmospheric pressure, total hydrocarbons, carbon monoxide, nitrogen dioxide, and sulfur dioxide. Most of the fungal categories had higher levels in 1994 than in 1995-96, probably due to urbanization of the study area. In this study, we demonstrated complicated interrelationships between fungi and air pollution/meteorological factors. In addition, long-range transport of air pollutants contributed significantly to local aeroallergen levels. Future studies should examine the health impacts of aeroallergens, as well as the synergistic/antagonistic effects of weather, and local and global-scale air pollutions.