Seasonality of biological aerosol particles associated with African dust storms

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There is a need to expand our knowledge of the diversity and biogeography of airborne microorganisms, since air connects all ecosystems at the Earth's surface. One of the most important phenomenon which can illustrate the role of the atmosphere as a dispersal mechanism for particulate matter is dust storms, that happen when the top soils from large deserts become airborne, and they can travel great distances through the atmosphere (Goudie and Middleton, 2001). More than half of the dust being transported in the atmosphere is believed to have originated from the Sahara-Sahel region in Africa (Kellog and Griffin, 2006). These dust storms are carrying microorganisms along with the mineral particles (Griffin, 2007).

Studies have shown that the global microbial taxa are not homogeneously distributed in the air, and the regional differences and how they come to be needs to be further understood (Fröhlich-Nowoisky *et al*, 2012). In order to better understand the relationship between microorganism transport and dust, the present study aims to seek for a rhythm in the airborne contents found in African dust events.

Air filter samples were collected between January 2011 and January 2012 in the Santiago Island from the Cape Verde archipelago. The sampling was done with a Hi-Vol with a PM10 head inlet and flow rate of 1,13 m^3min^{-1}.

Deoxyribonucleic acid (DNA) of filter sample aliquots were extracted, amplified, cloned and analysed as previously described (Fröhlich-Nowoisky *et al*, 2009). Primer pairs were used for targeting Fungi and Archaea.

Preliminary results show high species richness and seasonal cycles for different groups of Fungi and Archaea. In Archaea, there is a predominance of *Thaumarchaeota*, a recently defined phylum which contains all known ammonia-oxidizing Archaea (Stahl and de la Torre, 2012). Among *Euryarchaeota*, there are members of *Halobacteriales* and *Thermoplasmatales*, which are groups of extremophilic microorganisms. Although *Thaumarchaeota* are more diverse the whole year, the species richness for both phyla is highest in winter, which is the season with more dust storms, and lowest in spring.

For Fungi, *Basidiomycota* are slightly more diverse than *Ascomycota*. Members of the *Agaricomycetes* are predominant for *Basidiomycota*, with *Dothideomycetes* and *Sordariomycetes* appearing more often for *Ascomycota*. *Ascomycota* have higher species richness during summer and lower species richness during fall and winter, with a minimum in winter. *Basidiomycota* have a maximum of species richness in fall, with the lowest values observed during spring.

To expand the present data set, further results obtained from sequences that are still being analysed will be revealed.

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