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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Fungi Diversity in PM_1 and $PM_{2.5}$ at the summit of Mt. Tai: Abundance, Size Distribution, and Seasonal Variation" *by* Caihong Xu et al.

Anonymous Referee #1

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The study reported in this discussion paper describes fungal compositions and diversities in airborne PM1 and PM2.5 fractions that were collected at the summit of Mt. Tai, China. The study used quantitative PCR and high-throughput sequencing for the analyses of airborne fungal communities. I have several technical concerns, which are described as follows:

Major comments

Page 3 Line 21 More detailed information of the air samplers used in this study should be reported. Are they inertial impactors? If so, what is the sharpness of cutoff diameters for each stage? Also, how was particle bounces were prevented from the upper stages? Particle bounce can significantly distort the measured particle size dis-

tributions (e.g., Dzubay et al. (1976) Atmospheric Environment 10(3), 229-234). In particular, large particles can bounce from upper stages, because of their large inertia, and can penetrate through impactors and reach to an afterfilter even though they are not in fine fractions. If impactors were used, please state how particle bounces were prevented.

Page 4 Line 24 Were the chimeric sequences removed? The researchers reported more than 10% of the ITS sequences submitted to the public archives contained chimeric reads (Nilsson et al., (2015) Microbes and Environments 30(2): 145-150). This might affect the alpha diversity analyses, so it may be better to check.

Page 5 Line 5 How were airborne fungal concentrations calculated? Specifically, how did the investigators confirm or assume DNA extraction efficiency from fungal spores from air filters? It can affect final air concentrations reported.

Page 7 Line 39 Fungi in the class Dothideomycetes, including Alternaria, produce large multicellular spores, with reported spore sizes of 18–83 $\times$ 7–18 μm for Alternaria (Cole and Samson (1984) Mould allergy. Lea & Fibiger: Philadelphia, pp 66–104). It is hard to believe Alternaria was found in PM1 fraction, given with their large spore sizes, and I suspect it might be caused by sampling artifacts (e.g., particle bounces).

Minor comments

Page 6 Line 25 I could not understand why straw combustion can contribute airborne fungal DNA in PM1.

Page 7 Line 5 Do the authors believe 0.067% and 0.096% contributions truly non-negligible?

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