

***Interactive comment on* “Bacterial diversity in Himalayan glacial ice and its relationship to dust” by S. Zhang et al.**

Anonymous Referee #1

Received and published: 4 September 2008

The paper is well written. The authors are pursuing an interesting question regarding the relationship of cell concentration and microbial diversity to a dust concentration (which may serve as a climate indicator) in a millennium old Himalayan ice core. The goals of the study as well the methods used are well rationalized. I especially appreciate that the authors took a good care to make sure to avoid contamination of the samples. Overall in the study, there are however several things that do concern me:

1. The major result: positive correlation between the Shannon-Weaver Index and the Ca^{2+} concentration is very weak and not linear at all (see Fig 8 on 3456p). I do not really think that the authors proved anything other than that there is a non-existent relationship between Ca^{2+} and Bacterial concentration and Shannon Weaver Index respectively. Moreover, there is no need to explain the process of dating the ice cores

using soluble ions and isotope concentration in the methods section when it is not pursued in Results and Discussion apart from reference to another paper.

2. I think they have a lot of data but somehow those are not shown or discussed in the paper. There is a potential to gain a lot of information from the DGGE and bacterial counts data but they are not mention in other way than with regard to the concentration of the Ca²⁺ ions. No explanation is given for different bacterial concentration and community diversity at different depths of the ice core and its relationship to the age of the ice or climate condition at that period. In the Abstract it is mentioned:" There are four general periods of bacterial diversity, corresponding to four phases of dust abundance revealed by Ca²⁺ concentrations. It is indicated that higher bacterial community diversity is associated with warm periods, while lower bacterial community diversity with cold periods." However, there is no evidence given to support this statement.

I encourage publication of this paper.

Interactive comment on Biogeosciences Discuss., 5, 3433, 2008.

BGD

5, S1630–S1631, 2008

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