

Interactive comment on “Culturable bacteria in Himalayan ice in response to atmospheric circulation” by S. Zhang et al.

Anonymous Referee #1

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Review of: Culturable bacteria in Himalyan ice in response to atmospheric circulation. S.Zhang, S. Hou, X. Ma, D. Qin and T.Chen

This manuscript describes a series of studies in which various ice core samples were examined to determine the concentration and diversity of culturable bacteria present within the various layers of ice. The paper describes various concentration differences and demonstrates a wide diversity (based only n 16S rRNA sequence data) present within the core layers. The techniques used to accomplish this research are certainly appropriate to the field. The authors describe their basic results and conclusions within a relatively short manuscript. Having examined and thought about this manuscript I find that I honestly cannot totally accept the conclusions provided. The authors state that the region the core with highest numbers equates to the monsoonal period in

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the region and that the high numbers of microbes present in that layer arise because the organisms are carried by the monsoon. That is fine and could well be the case. However the problem I see is that the authors offer no data to show that the core they use actually has a level of resolution sufficient to discriminate within levels as small as a month (or even a couple of weeks). The fact that this core section contains the highest amount of dust, does not prove to me that the ice in that region formed from waters carried north by the Monsoon rains which would tend to wash such material out of the air. Rather, I see no reason why it would not be the opposite situation, that this area arose when winds were carrying particles out of the desert in which case there would be little rain to cause the dust to settle when it reached a more quiescent air around the glaciers. Further the size of the population (stated as 7.0 CFU ml⁻¹) within the “most heavily populated core section” is incredibly low and would have a high probability of arising from air contamination during sampling. I am actually surprised they were able to detect bacterial numbers as low as this. Nor does it surprise me that dust filled air would carry more microbes than would non-dusty air. Microbes attach to all soil surfaces and would be carried on that dust in any high wind. Nor am I overly impressed by the sequences found since even here there is no clear demarcation between the microbial types with sequences from all core layers present in all regions of the tree in Figure 3. In conclusion, while this is a paper that can be published it is not one that presents new ideas or stimulating data. Prior to any formal publication I would recommend several modifications. First the paper does need someone to review and correct the English as there are several missing articles (i.e. the, a etc) which often happens because of the differences between Chinese and English. Second, figure 3 must be enlarged and made more readable. Finally, the paper would certainly benefit from some data showing that the monsoons do carry more sedimentary load and a better description of the significance of the data in Figure 2 relative to the different seasons needs to be verified.

Interactive comment on Biogeosciences Discuss., 3, 765, 2006.

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