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Miaoergou Glaciers in the Kalik Mountains, western China: Report of a reconnaissance for future ice core drilling and biological study

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Abstract

Glaciological field studies on Miaoergou Glaciers in the Kalik Mountains, western China were carried out in 2003 and 2004 to investigate the possibility of future ice core drilling and biological observation. Two glaciers, which have dome-shaped accumulation areas at an elevation of approximately 4500 m a.s.l., were investigated. Radio-eco soundings showed that the ice thickness at the top of the two glaciers was 43.7 and 29.6 m, respectively. Snow-pit observations revealed that superimposed ice appeared at 20–50 cm below the surfaces at the top of both glaciers, indicating that significant melting had occurred during summer. Analyses of a 2-m-depth ice core drilled on one of the glaciers showed that it consisted mostly of continuously refrozen ice and that the $\delta^{18}O$ varied from −15.7‰ to −7.2‰ with a mean of −10.2‰. In the ice core were three visible dust layers, one of which contained various microbes including cyanobacteria. Whereas the $\delta^{18}O$ record had proved rather unsatisfactory as an air temperature proxy due to melt water runoff, a reconstruction of dust deposition and biological activity on the glacier might be possible using an ice-core study.