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High resolution climate record from two stalagmites in Qixing cave, South Guizhou, and Heinrich events during the last glacial Period



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Qixing Cave is situated ~1.5km southwest of Kaiyou village, 100km to the southwest of Duyun city, Guizhou. It is located in the southeast of the Yunnan and Guizhou Plateau, and belongs to a concentrated cluster-depression area of the karst plateau in the southeast monsoon area of the subtropical zone. The average air temperature in the area is about 15.3°C, the annual evaporation rate is about 1550.6mm, which indicates inadequate humidity.

The time sequence of high resolution paleo-climatic change since the last glacial period-60,500 yr B.P. has been reconstructed by high precision TIMS-U series dates and analysis of the oxygen isotopes from two stalagmites(Q4 and Q6) of Qixing Cave in South Guizhou. Comparative analysis of $\delta^{18}O$ curves from the GISP2'ice core and the stalagmites shows that the depositional records of the Dansgaard - Oeschger cycle events 1-18 and Heinrich's events H1- H5 from the records of two stalagmites in South Guizhou reflected rapid climate change over a short time scale since the last glacial stage, and indicates the precise boundary lines at which the cold events occurred. The study results have shown that the records of the cold and warm events from two stalagmites since 60,500yr B.P. in South Guizhou are the reflection of the paleo-monsoon circulation. Changes are clearly affected by the climate oscillation of the North Atlantic Ocean, and indicate that they have a strong tele -

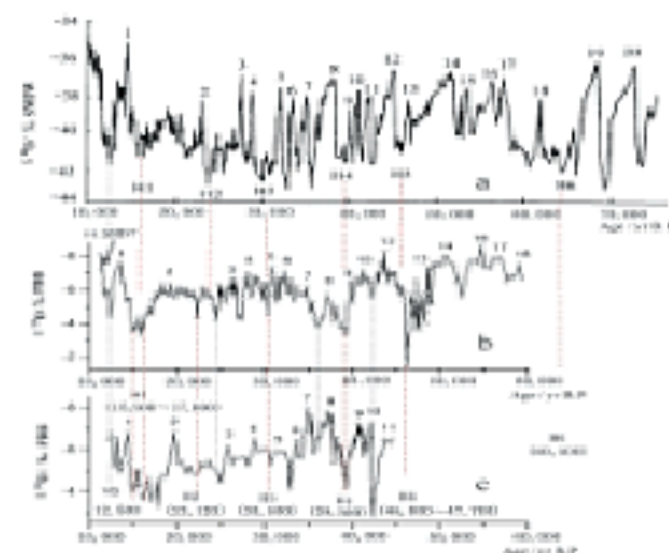
Karst landform



Stalagmite Q6



Stalagmite Q4



Comparison of the oxygen isotope record of two stalagmites in Guizhou with the Greenland ice core - GISP2 core
 a. GISP2 core(Dansgaard/W et al, 1993; Stuber/M, Geolochy 2000)
 b. $\delta^{18}O$ record of Q6 and Q4 stalagmites respectively

Conclusion: The records of $\delta^{18}O$ from the stalagmites(Q4 and Q6) indicate that the $\delta^{18}O$ values from 60,590 yr B.P. to 11,290 yr B.P. changed from the more negative (or lighter) drift to a heavier or positive drift trend in the last glacial period. The data reflect the weakening of the Asian summer monsoon, and the climate generally became drier and cooler.

Fish in cave puddle



Rock desertification in Guizhou

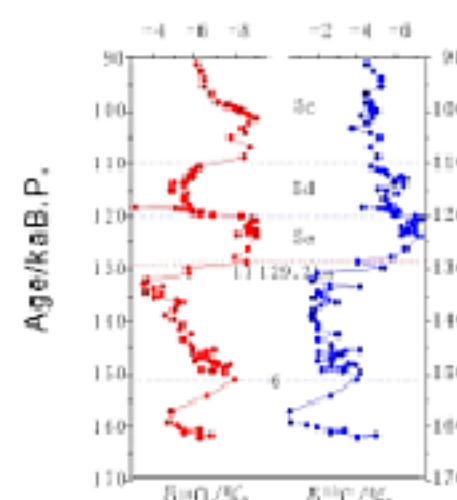


Stalagmite D3



Oxygen and Carbon Isotopic Curves of Stalagmite D3 from Dongge Cave, Guizhou

The 210cm high stalagmite was taken from inner part of the cave, with air temperature ranging between 15.2-16°C. 21TIMs U-series datings were made with samples taken along the center axis of the stalagmites. 118 stable isotopic analysis were made with an average resolution of 620 years. The records can be correlated with deep sea core isotopic stages 5c to 6. The end of penultimate Glaciation(II) was at 129.3±1.1ka.



During the period from 133ka to 129.3ka, the δ -value of stable isotope descended quickly, showing a rapid rising in temperature.