ミャンマー・バゴー山地産チークにおける年輪セルロース酸素同位体比変動

Cellulose oxygen isotopic time series of teak disks collected from Bago Mountains, Myanmar

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Myanmar is a region that is strongly affected by the Asian monsoon, and past climate information is very important to understand its mid- to long-term fluctuations. However, in Myanmar, there are a few past meteorological data due to its historical background, so an alternative indicator of paleoclimate reconstruction is necessary to obtain long-term weather information. In this study, I focused on the annual ring width and the cellulose oxygen isotopic composition ($\delta^{18}O$) of teak annual rings collected from Bago Mountains in central Myanmar, analyzed the correlation between them and the amount of precipitation, and examined whether they could be an index of paleoclimate restoration.

The samples used were six discs of teak from Bago Mountains with 95-97 tree rings, cut between 2001 and 2003.

First, focusing on the annual ring width, a significant positive correlation was obtained between the annual ring width and the rainy season precipitation in three samples. This is consistent with the results of Pumijumnong (2012), that reported the correlation between teak rings and rainy season precipitation in northwestern Thailand and D 'Arrigo et al. (1994), that reported the same using teak ring widths in Indonesia. This suggests that teak annual ring width well reflects precipitation in rainy season and might be a useful tool for rainfall reconstruction in central Myanmar.

On the other hand, few samples showed a significant correlation between $\delta^{18}O$ and rainy season rainfall. This is a different result from previous studies in Southeast Asia, such as Buajan et al. (2016), that reported a negative correlation between teak-ring $\delta^{18}O$ and rainy season precipitation in northwestern Thailand, or Schollaen et al. (2013), which showed a negative correlation between the two in Indonesia. This might be caused by the difference of the origin of rain fall in rainy season. This means that the origin of precipitation in Bago Mountains changes from Bay of Bengal to South China Sea during the rainy season. In other words, the isotopic composition of precipitation itself is high in the early rainy season and low in the late rainy season due to the different origin of the rainwater and the different isotope fractionation in the process of coming to Bago Mountains. Since the isotopic composition of precipitation has a seasonal change, the annual ring $\delta^{18}O$ response to the rainfall amount is dull in Bago Mountains. Then, for some annual rings, I subdivided one annual ring to six or twelve parts and measured the variation of $\delta^{18}O$ within the same year. As a result, the variation between individuals was matched better, and the tendency was different every year. These suggest that it is difficult to use the $\delta^{18}O$ of the teak annual tree-ring in Bago Mountains to duplicate the amount of annual rainfall itself, but it has the potential to explain the fluctuation of the annual rainfall or the relationship of the seasonal winds that come from different part by subdividing the annual rings.

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