

On the possibility of tree-ring $\delta^{18}\text{O}$ in Java, Indonesia for paleoclimate proxy

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The Indonesian region plays a key role in global climate system because active convection in this region is considered as a heat and moisture source which drives global circulation. Although $\delta^{18}\text{O}$ in tree-ring has been used to reconstruct hydroclimatic and atmospheric circulation, there are only a few paleoclimate reconstruction based on $\delta^{18}\text{O}$ in tree-ring in Indonesia (Scholllaen et al., 2013, Poussart et al., 2004). In this study, we measured tree-ring $\delta^{18}\text{O}$ in Java Island to explore the possibility of tree-ring $\delta^{18}\text{O}$ as proxy.

We used four teak (*Tectona grandis*) samples collected at Sumedang, Western Java. Samples were cut into annual rings after cellulose extraction. $\delta^{18}\text{O}$ of individual rings were measured by TCEA-IRMS. We analyzed 59 years (1940-1998). Time series variation of $\delta^{18}\text{O}$ are correlated between the four samples, and EPS (expressed population signal) values are 0.89-0.93. In addition, the $\delta^{18}\text{O}$ time series of this study (Western Java) are very similar to that of Scholllaen et al.(2013) (Eastern Java). This suggests common climate signals preserved in teak tree-ring in Java Island. $\delta^{18}\text{O}$ time series of our samples shows positive correlation with that of precipitation in the last dry season and negative correlation with that of precipitation in rainy season (growing season). Scholllaen et al. (2013) suggests this is because dry season precipitation has relatively high $\delta^{18}\text{O}$ compared with rainy season precipitation.

We checked the correlation with DMI (Dipole Mode Index). The results show tree-ting $\delta^{18}\text{O}$ in Western Java has a negative correlation with last dry season DMI. This is probably because DMI has a negative correlation with dry season precipitation in Java Island (Ashok et al., 2003).

For future plan, we are going to analyze using tree-ring isotope model, in order to assess the reliability of tree-ring $\delta^{18}\text{O}$ as climate proxy in Java.

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