

Comparison between Climate and Teak Tree Ring Widths in Bago Mountains, Central Myanmar

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Asia monsoon has powerful effect on the climate of all over the world and revealing the long-term system of it is very important to restore the past climate. It also make great effect on the climate in Myanmar, so Myanmar can be an important target area for its research. However, the long-range climate record in Myanmar is very poor. So the alternative parameter which can restore the climate indirectly is needed to know the climate of the past. A teak annual tree-ring can be named as one of the media climate information on the past is being recorded. Climate reconstruction using width of annual ring and the isotopes of a teak annual ring has been performed at the tropical area, but there are few study examples in Myanmar. D' Arrigo et al. (2011), one of the previous research, showed positive correlation between teak tree-ring width and precipitation in North Myanmar. Although Myanmar is a long country in north and south, there is a possibility that an annual ring in an area south of the central part indicates a reply different from the previous research. So in this study we use three teak disk samples from Bago Mountains in Central Myanmar and consider what kind of climate information the width of annual ring reflected or the possibility that teak tree-ring can be used for climate reconstruction.

At first, we decided the age of rings by cross dating. We measured the annual ring area and derived width by "method of approximation as circle or sector" (Arai, 2016: Graduation thesis). Then we got the tree ring index by fitting using a spline curve. Comparing each tree ring index or them with the tree ring index in North Myanmar (D' Arrigo et al., 2011) and in Northwest Thailand (Pumijumnong, 2012), we decided about annual rings were started to be formed from 1906.

Next we carried out the correlation analysis among the tree ring index, amount of precipitation and PDSI (Palmar Drought Severity Index). The result shows that (1) tree ring index of three samples are positively correlated with rainfall in rainy season, (2) tree ring index of two samples and rainfall in late rainy season, especially in August and September are related to positive correlation, which is inconsistent with Pumijumnong (2012) that showed positive correlation between tree ring index and rainfall in early rainy season. On the other hand, there is no correlation between tree ring index and PDSI in three samples, which is inconsistent with D' Arrigo et al. (2011) and Pumijumnong (2012) that showed positive correlation between tree ring index and PDSI in rainy season. Little of the seasonal variation of temperature or the river and basin system around the growing area are considered as the reason that PDSI was not reflected strongly.

In conclusion, our research confirmed that teak tree ring reflects amount of precipitation and indicated that teak will have potential for climate reconstruction in Central Myanmar. Additional data of more teak samples and using isotopes in tree rings are necessary to make the research.

Keywords: teak, tree ring, Myanmar