

Difference between the transpiration rates of Moso bamboo (*Phyllostachys pubescens*) and Japanese cedar (*Cryptomeria japonica*) forests in a subtropical climate in Taiwan

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Bamboo forests have been expanding rapidly in Asian countries for the past 50 years. Whether natural or artificial, this expansion involves the replacement of other vegetation types by bamboos, which could impact the local water cycle. Previous studies in Japan have reported that bamboo forests have higher transpiration than coniferous forests under temperate climates, but it is unknown whether this finding applies to subtropical climates. Thus, we examined whether a Moso bamboo (*Phyllostachys pubescens*) forest would exhibit higher transpiration in a subtropical climate. We used the sap-flux method to estimate the stand transpiration (E) of Moso bamboo and Japanese cedar (*Cryptomeria japonica*) forests in Taiwan. As was observed in the Japanese studies, annual E for bamboo (478 mm) was higher than that for cedar (122 mm), although we found a difference in the seasonality of E between the Taiwanese and Japanese sites. If this finding is indeed generally applicable, the results of this study and previous studies suggest a significant change in E and, therefore, the terrestrial water cycle when Japanese cedar forests are replaced by bamboo forests. Furthermore, the difference in canopy conductance (G_c) for bamboo was higher than that for cedar in Taiwan, which was reported previously for Japan. This difference in G_c between bamboo and cedar suggests that such replacements will result in considerable changes in the terrestrial carbon cycle.

Keywords: Moso Bamboo, Japanese cedar, transpiration, transpiration seasonality