Some findings from on-going construction of database for functional traits of Sugi and Hinoki

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Recent increases in air temperature and extreme climatic events strongly arise the needs for assessing the impact of climatic change on forestry. This is particularly an emergent requirement in artificial forests of Sugi (*Cryptomeris japonica*), since this species is more sensitive to drought and has already exhibit symptoms of water stress in the forests of southwest Japan.
An accurate assessment requires the use of species' specific traits as parameters in the models, which could then simulate realistic forest dynamics. However, for afforestation species, few studies have measured their ecophysiological traits with the intention of using them in the models, and thereby a reliable set of parameters for a targeted species is not readily available. On the other hand, for this half century, Japanese researchers have extensively studied physiology, stand structure and carbon cycle of major afforestation species, which now form a huge stock of information. Reviewing such studies to reveal the means and the ranges of given traits, factors responsible for the ranges, and the relationship between traits will significantly contribute to the improvement of the accuracy of assessment. We are now surveying vast literature on Sugi and Hinoki cypress (*Chamaecyparis obtusa*) that have published so far and constructing a database of their functional traits. Here, we report some findings obtained from our database consisted of data collected by more than 100 papers.
The recent spread of portable gas-exchange measurement system and the development of the study of leaf traits syndromes had provided relatively abundant data on leaf physiology (e.g. photosynthesis, leaf nitrogen content, stomatal conductance) and leaf morphology (SLA, LMA) in Sugi and Hinoki. In both species, photosynthetic capacity that were measured under different condition (light, nitrogen availability, water application, month, leaf age, leaf location in the crown) varied more than 10 folds, which ranged 0.34 - 12.69 μmol m^{-2} s^{-1} in Sugi and 0.37 - 9.85 μmol m^{-2} s^{-1} in Hinoki. Stomatal conductance also showed more than 10 folds difference, while area-based leaf nitrogen content and SLA varied only 2 - 4 folds, suggesting that the stomatal conductance is responsible for the large variation in photosynthesis. Relatively few studies measured seasonal changes in these parameters, although they could have large influence on the model prediction. Therefore, in this study, we also attempt to reveal the phonological characteristic of these traits by meta-analysis.

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