

The light distribution and the canopy leaf characteristics of *Chamaecyparis obtusa* var. *formosana* in a subtropical mountainous cloud forest in northeastern Taiwan

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The tree canopy light distribution and leaf acclimation were investigated by canopy positions and leaf ages on 40-year-old Taiwan yellow false cypress (*Chamaecyparis obtusa* var. *formosana*) trees in a subtropical mountainous cloud forest. The results showed that the average daily diffuse light was 1.2- to 2.1-fold of direct light above forest canopy. The ecosystem was dominant by diffuse light. The ratio of direct light to diffuse light didn't significant changed along canopy depth. All examined leaf characteristics at the yellow cypress canopy were strongly ontogenetically related to the leaf growth and aging process. Mature leaves show significant higher chlorophyll content and allocated more portion of nitrogen to chlorophyll than other leaf ages, and thus resulted in highest photosynthetic capacity. However, the LMA increased and nitrogen content decreased in leaf life span. The morphological acclimation and resource allocation optimized the photosynthetic ability of whole canopy. The nitrogen content was higher at the high light regime to achieve high A_{max} and the mass-based (Chl_{mass}) is higher at the low light regime to allow the higher quantum yield (Q_y) at the shade bottom canopy. The most light distribution and leaf characteristics were not significantly varied in canopy aspects, only the direct light portion showed higher at the south canopy and the A_{max} and Q_y of leaves at the east canopy were significant higher than other aspects. These findings suggest that frequent fog occurrence and prevailing diffuse light condition result in more even distribution of light within yellow cypress tree canopy and hence reduced the shade stress on the bottom of canopy.