

# Variation in oxygen isotope ratio of plant water in a Mongolian larch forest and its comparison with model estimation

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Oxygen isotope ratios of foliar water ( $\delta^{18}\text{O}_{\text{wl}}$ ), stem water ( $\delta^{18}\text{O}_{\text{ws}}$ ), and soil water ( $\delta^{18}\text{O}_{\text{soil}}$ ), from a mountain larch forest in Mongolia were investigated in the 2003 growing season. Daily pattern of  $\delta^{18}\text{O}_{\text{wl}}$  presented a lower value in the early morning and a peak value in the mid afternoon. Daily evaporative enrichment of both sunny and shady leaves exceeded c. 9 per mil. Even at predawn, leaf water and stem water were not isotopically equal and thus leaf water was consistently more enriched in  $^{18}\text{O}$  relative to stem water. Shady leaves displayed less enriched in  $^{18}\text{O}$  than sunny leaves. The Craig-Gordon evaporation model was used to model daily pattern for  $\delta^{18}\text{O}_{\text{wl}}$  and gave an overestimation of  $\delta^{18}\text{O}_{\text{wl}}$ . Seasonal investigation of  $\delta^{18}\text{O}_{\text{ws}}$  and  $\delta^{18}\text{O}_{\text{soil}}$  revealed the water strategies by this larch forest.