



## Paleohygrography and reconstruction of lake evaporation history based on compound-specific hydrogen and oxygen isotope analyses of biomarkers – principle of the coupled isotope approach, advances and limitations

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The oxygen and hydrogen isotopic composition  $\delta^2\text{H}$  and  $\delta^{18}\text{O}$  of leaf and lake water reflects the isotopic composition of source water/precipitation modified by evapo(transpi)rative enrichment. This later enrichment can be illustrated and quantified using  $\delta^2\text{H}$ -  $\delta^{18}\text{O}$  diagrams and the deuterium-excess. The enrichment of leaf water thereby depends primarily on relative air humidity (RH) and can be investigated using biomarkers being produced in leaves. The enrichment of lake water depends on lake evaporation and can be investigated using biomarkers being produced by aquatic macrophytes or algae. Provided that unambiguous terrestrial and aquatic biomarkers can be identified in lake sediments, the coupling of  $\delta^2\text{H}$  and  $\delta^{18}\text{O}$  hence allows reconstructing RH (paleohygrography approach) and lake evaporation history. In our contribution, we discuss the potential, the advances and the limitation of the coupled isotope approach based on leaf wax-derived *n*-alkane and hemicellulose-derived sugar biomarkers ( $\delta^2\text{H}_{n\text{-alkanes}}$ -  $\delta^{18}\text{O}_{\text{sugars}}$ ).

### References

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