

# Isotope and Lignin Signature in Lake Erhai (Southwest China): Evidence for Paleovegetation Changes and Asian Monsoon Variability during 18.5 ky BP

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## Abstract

Stable carbon isotope and CuO-oxidation lignin products of organic matter in a sediment core collected from a subtropical high altitude lake (Lake Erhai, Southwest China; 25°50' N and 100°10' E) were analyzed to reconstruct vegetation changes and to find relationship between vegetation and climate. The stable carbon isotope values ( $\delta^{13}\text{C}$ : -28.8 to -23.9 ‰) indicated that terrestrial derived organic matter in the lacustrine deposit was mostly originated from C<sub>3</sub> plants throughout the deposition periods. Compositional patterns within phenolic suite of CuO-oxidation products suggested large scale changes in terrestrial vegetation in the lake catchments from gymnosperm to angiosperm at the early-Holocene transition.

In the application of CuO-oxidation lignin products, a molecular index called lignin phenol vegetation index (LPVI) has been developed by using available plant-lignin phenol data. The LPVI of the Lake Erhai sediment core provides better resolution than other lignin parameters used previously, and reveals few minor vegetation change events in the Holocene. In comparison to past Asian monsoon records ( $\delta^{18}\text{O}$  record in Stalagmite of Dongge cave, 25°17' N, 108° 5' E, elevation = 680 m) [1], LPVI suggested a direct linkage between vegetation changes and Asian monsoon variability that might be influenced by global climate changes.

## References

[1] Dykoskia C.A., Edwards R.L., Cheng H., Yuan D., Cai, Y., Zhang M., Lin Y., Qing J., An Z. and Revenaugh J. (2005) Earth and Planetary Science Letters 233, 71– 86.