

## The influence of extracellular enzyme and protein to organic matter degradation in Lake Erhai sediments

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Organic matter, extracellular enzyme and dissolved organic carbon (DOC), protein were determined in sediments and pore waters of Lake Erhai respectively. Lake Erhai is located in the northern Dali city of Yunnan Province. It is 42 km in length and 8.4 km in maximum width. The lake surface is about 1974 m above mean sea level and water area is 249.8 km<sup>2</sup>.

Organic matter contents decrease with depth and reach relative low level in 6 cm. DOC concentration was downward from suspend layer to 5 cm. Lowest concentration was appeared from 5 cm to 8cm in sediment pore waters. Organic matter was mainly degraded within 6 cm of upper layer sediments of Lake Erhai. The degradation of organic matter constitutes was influenced by extracellular enzymes. Activities of both  $\alpha$ -glucosidase and  $\beta$ -glucosidase are highest in suspend layer. It indicates starch and cellulose etc was hydrolyzed largely. Enzyme activities decrease gradually with the sediment depth. Protein is a part of organic matter and easy to be decomposed. Protein contents decrease to a low level in 7 cm depth in pore water of sediments. Organic matter and protein have the same vertical variation trends in Lake Erhai sediments. Protein as a important constitute influence the variation of organic matter.

### Acknowledgements

Support by the National Natural Science Foundation of China (No.40473050) is acknowledged.

## Fe isotope geochemistry in coastal dune pore waters and associated seeps

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The biogeochemical reduction and oxidation of Fe-oxide minerals in Pleistocene and Holocene dune sheets of the Oregon (USA) coast play a important role in the hydrology and geotechnical stability of these sediments/soils. Understanding the processes that control the precipitation of iron-cemented horizons within these soils/sediments, as well as their subsequent dissolution and further transportation of soluble iron to coastal beach seep pools, is key to characterizing these systems.

We have measured the dissolved constituents present in pore waters collected from wells along a transect of the dunal soils. Additionally, we have used iron isotope fractionation to trace the movement of Fe through the different ecological pools within the coastal dunes. Our results are compared to current models of Fe cycling and isotope fractionation in nature (Johnson et al. 2004; Bullen et al. 2001).

### References

- Bullen T.D., White A.F., Childs C.W., Vivit D.V. and Schulz M.S., (2001), *Geology* **29**(8). 699-702.  
Johnson C.M., Beard B.L., Roden E.E., Newman D.K. and Nealon K.H., (2004), *Reviews in Mineralogy and Geochemistry: Geochemistry of Non-Traditional Stable Isotopes* **55**. 359-408.