

## TRACING ENVIRONMENTAL CHANGES IN LAKE TSWAING (SOUTH AFRICA) USING BULK AND COMPOUND SPECIFIC STABLE CARBON ISOTOPES

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Deeper time palaeoclimate reconstructions are still rare on the continental southern hemisphere. Here we present new biogeochemical data from a core retrieved in the crater lake Tswaing (formerly “Pretoria saltpan”). This opens a perspective to get a more detailed view into climate variability of the subtropical region of South Africa on the glacial/interglacial time scale.

Sediments from Lake Tswaing (25°24'30'' S, 28°04'59'' E) document environmental changes in southern Africa during the last 200 kyr BP. Previous investigations using basic geochemistry (TIC, TOC, TN), biomarkers, organic petrology and Rock-Eval pyrolysis reveal different sources for the organic matter of Lake Tswaing sediments like land plants, *Botryococcus braunii*, cyanobacteria and ciliates (Kristen *et al.*, 2007.). They show a shift from a bacterial to a more algal dominated ecosystem in the lake and back again at the end of the last interglacial (MIS 5) and MIS 4, respectively. Furthermore, we identified intervals with high autochthonous production alternating with periods of increasing amounts of allochthonous input in form of long-chain *n*-alkanes (*n*C<sub>29</sub>-*n*C<sub>31</sub>) and detrital minerals (Bühmann & Elsenbroek, 1999). Possible mechanisms responsible for this pattern are changes in the hydrological budget of Lake Tswaing as well as preservational effects. Pollen which are widely used to reconstruct past changes in rainfall and corresponding freshwater input are not preserved over big parts of the profile (Scott, 1999). Thus we use indirect methods like the  $\delta^{13}\text{C}$  of organic material to infer changes in vegetation pattern (C3 versus C4 land plants) due to varying moisture availability (e.g. Talbot & Johannessen, 1992; Street-Perrot & Ficken, 2004). Yet, in lake sediments  $\delta^{13}\text{C}_{\text{TOC}}$  represents a mixed isotopic signal from land plants, aquatic organisms and microorganisms. Compound-specific stable carbon isotope ratios can refine the interpretation of  $\delta^{13}\text{C}_{\text{TOC}}$ . Here we present  $\delta^{13}\text{C}$  values of biomarkers representing land plants, algae and bacteria which delineate changes in the atmospheric and aquatic carbon pool. The results will be used to distinguish between authigenic and allogenic processes recorded in the Lake Tswaing sediments.

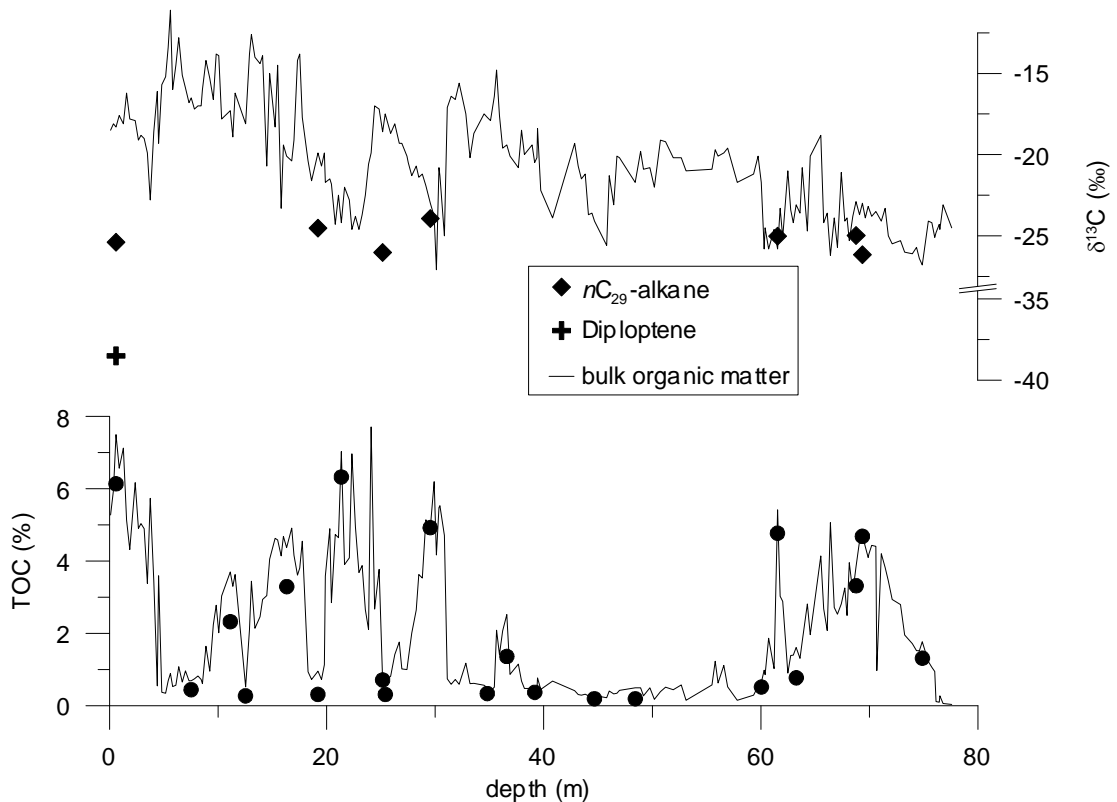


Figure 1. Total organic carbon content and stable carbon isotope values from Lake Tswaing sediments covering the last ~200 kyr BP. Black dots in the lower panel represent samples which have been analysed in detail for biomarker distributions and their stable carbon isotopic signatures.

## REFERENCES

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