



## **Radiocarbon dating of large termite mounds of the miombo woodland of Katanga, DR Congo**

Hans Erens (1), Mathieu Boudin (2), Florias Mees (3), Mathijs Dumon (1), Basile Mujinya (4,1), Mark Van Strydonck (2), Geert Baert (1,5), Pascal Boeckx (6), and Eric Van Ranst (1)

(1) Ghent University, Geology & Soil Science, Gent, Belgium (hans.eren@ugent.be), (2) Royal Institute for Cultural Heritage, Jubelpark 1, B-1000 Brussels, Belgium., (3) Department of Geology and Mineralogy, Royal Museum for Central Africa, Leuvensesteenweg 13, B-3080 Tervuren, Belgium , (4) Department of General Agricultural Sciences, Faculty of agronomy, University of Lubumbashi, PO Box 1825, Lubumbashi, Democratic Republic of Congo., (5) Department of Applied Biosciences, Faculty of Bioscience Engineering, Ghent University, Valentin Vaerwyckweg 1, B-9000 Gent, Belgium, (6) Isotope Bioscience Laboratory – ISOFYS, Faculty of Bioscience Engineering, Ghent University, Coupure 653, B-9000 Gent, Belgium

The miombo woodlands of South Katanga (D.R. Congo) are characterized by a high spatial density of large conic termite mounds built by *Macrotermes falciger* (3 to 5 ha<sup>-1</sup>, ~5 m high, ~15 m in diameter). The time it takes for these mounds to attain this size is still largely unknown. In this study, the age of four of these mounds is determined by <sup>14</sup>C-dating the acid-insoluble organic carbon fraction of samples taken along the central vertical axis of two active and two abandoned mounds. The age sequence in the active mounds is erratic, but the results for the abandoned mounds show a logical increase of <sup>14</sup>C-age with depth. The ages measured at 50 cm above ground level were 2335 – 2119 cal yr BP for the large abandoned mound (630 cm high), and 796 – 684 cal yr BP for the small abandoned mound (320 cm high). Cold-water-extractable organic carbon (CWEOC) measurements combined with spectroscopic analysis revealed that the lower parts of the active mounds may have been contaminated with recent carbon that leached from the active nest. Nonetheless, this method appears to provide reliable age estimates of large, abandoned termite mounds, which are older than previously estimated. Furthermore, historical mound growth rates seem to correspond to past temperature changes, suggesting a relation between past environmental conditions and mound occupancy.

Keywords : <sup>14</sup>C, water-extractable carbon, low-temperature combustion