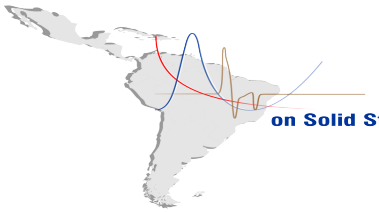

First Latin-American Congress
on Solid State Dosimetry and Radiation Measurements
13-17 September, 2021

An ESR dating mystery – solved?

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Introduction

Excavations at Magubike rockshelter, Tanzania, yielded bovid teeth and shells of the land snail *Achatina* sp. Both teeth and shells are considered good materials for ESR dating. However, the ESR ages for the Magubike teeth were significantly younger than those for the shells. At Mumba Cave (also in Tanzania) the dates from shells and teeth agreed, so in principle Achatina shells are suitable.

Materials and Methods

Studies of the Magubike shells showed that they contained a silicate as well as calcium carbonate and that the conventional ESR spectral peak was overbroad. Contrastingly, the spectral peak for the Mumba shells was normal, suggesting an underlying interference at Magubike. When the Magubike spectra were remeasured under conditions promoting greater resolution, such as at low power (0.01 mW vs. 'normal' 5 mW), the 'dating' peak narrowed and the ages decreased, but not enough to agree with teeth ages.

Results and Conclusions

The explanation appears to be the incorporation of silicate matrix from the granite of the rockshelter, While this 'solves' the problematic results, it suggests that shells from granite sites are unlikely to provide reliable ages.

Keywords

ESR Dating; Achatina Shells; Tanzania; ESR Materials; Shell formation