

Palaeosismic Approach in Agadir Region Using Wintimdouine Cave Speleothems Analysis (South-Western High-Atlas, Morocco)

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The analysis of the endokarstic system of Wintimdouine (High-Atlas mountains), is presented as an original approach for the palaeosismic study of Agadir region. The karst processes occur under the conditions of Quaternary and recent tectonics associated to a considerable seismic activity.

This work expose some comprehensive results performed by the analysis of speleothems observed inside Wintimdouine cave, one of the greatest underground systems in Africa.

The karst system of Wintimdouine is made by a several surface and subsurface relief disturbances, caused by catastrophic paleo-earthquakes. Impressive speleothems especially in shapes of stalactites and sodastraws show various damages that can be linked to brutal coseismic solicitations into different directions. Main examples are illustrated with collapses and slender speleothems break locally covering the cave floor. Some stalactites indicate recent horizontal fragile shears while others are fossilised by successive calcite neo-crystallisation stages. Elsewhere, speleothems coating is clearly unstuck from the cave roof that may indicate continuous vertical movements.

Using isotopic dating coupling to successive calcite neocrystallisation analysis leads to investigate a new way to establish first, a relationship between age and coseismic solicitations, then to improve events frequency and palaeosismic regional calendar. This is subsequently, very helpful to predict potential seismic events.

Such endokarstic palaeosismic study and its monitoring present a great practical implications for the region, since it concerns the biggest balneological center of the country and the largest urbanized and economic area in south of Morocco. It leads, particularly to carry out a risk assessment that must take precedence to pretend addressing regional natural hazard.

Key words: endokarstic, palaeosismicity, speleothems, wintimdouine, seismic hazard.