
Fuliginochronology: a new way of studying fire events chronicles, examples of speleothem deposits as archives.

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Résumé

The micromorphological study of fireplaces becomes more and more common, but biases exist in the recording of fire events in hearth structures. In this presentation, we will introduce another method for studying fire as an artefact: the *Fuliginochronology*, from Latin *fuliginosus*, *fuligo*: soot, fuliginous, and from Greek *khronologia*: chronology, which consists of studying the succession of soot deposits trapped in a matrix. Here we will only develop the cases of soot trapped in carbonate deposits and more specifically in speleothems. In the particular case of an archaeological site like a rock shelter or a cave, these fuliginous calcite deposits (i.e. stalagmite, parietal crust, flowstones) are a record of past human occupations, which can be enumerated (Vandeveldé et al. 2017a, b; Vandeveldé et Dupuis 2017).

This pioneer method is based on high-resolution observation of soot layers trapped in calcite

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deposits and of the speleothems themselves, coupled with complementary analyses (characterisation: SEM, Raman, FTIR, μ LIBS). It will be presented through three different temporal context: first, the method will be defined on a long archaeological sequence of Palaeolithic context at Grotte Mandrin site (middle Rhône Valley, France); then it will be validated on modern cases (Han-sur-Lesse, Belgium; Arcy-sur-Cure, France; Villars, France; Postojna, Slovenia), and finally, the use of experimental approach at Grotte Mandrin site will help us to address a number of questions about formation of fuliginous speleothems and preservation of soot through the study of present day data. This last part will also allow us to try to overcome limitations of the method in some contexts.

References

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Mots-Clés: Fuliginochronology, soot, carbonates, speleothems, human occupation