

# Odorant volatolome of *Tuber Melanosporum*: analytical and olfactometric approach



The black truffle *T. Melanosporum* has a unique odor consisting of a complex mixture of VOCs resulting from the catabolism of amino and fatty acids, and activity of the microbiome colonizing truffles. Among all these metabolites, only the odorous volatolome can explain the perceived aroma of the truffle. Besides, truffles have an optimal odor just after harvesting, which changes quickly during storage. Preserving this odorant volatolome is a challenge for truffle professionals.

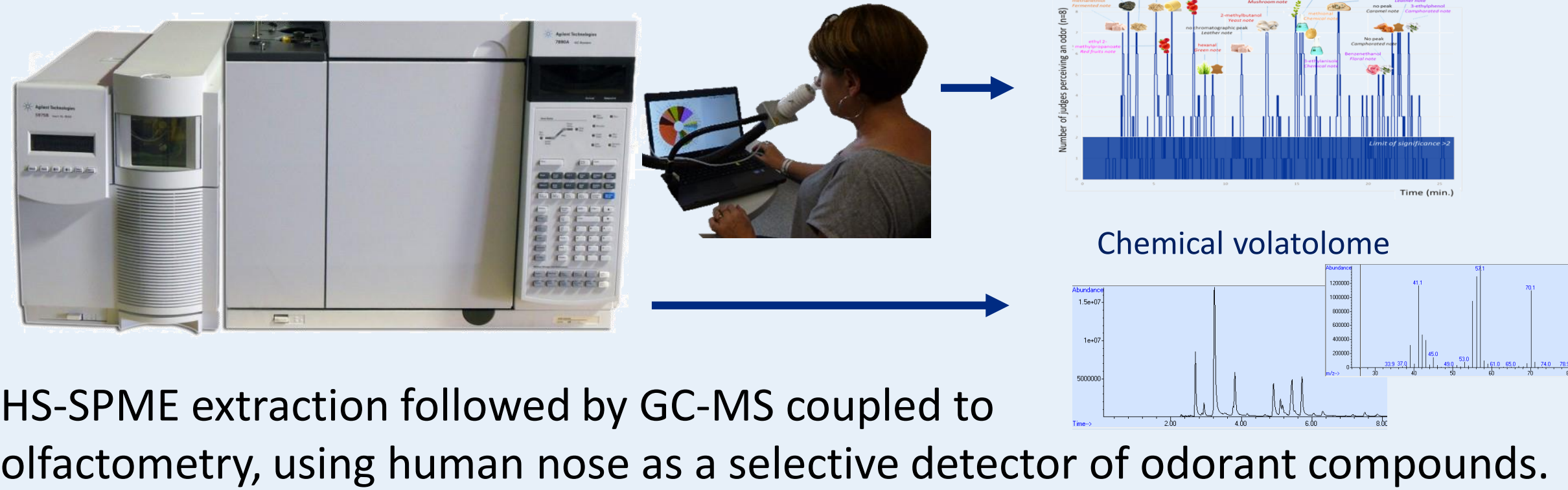
The objectives of this work were to :

- Characterize the odorant volatolome of the fresh odor truffle and its evolution during postharvest aging,
- Evaluate the impact of alternative conservation processes on the truffle odor preservation.

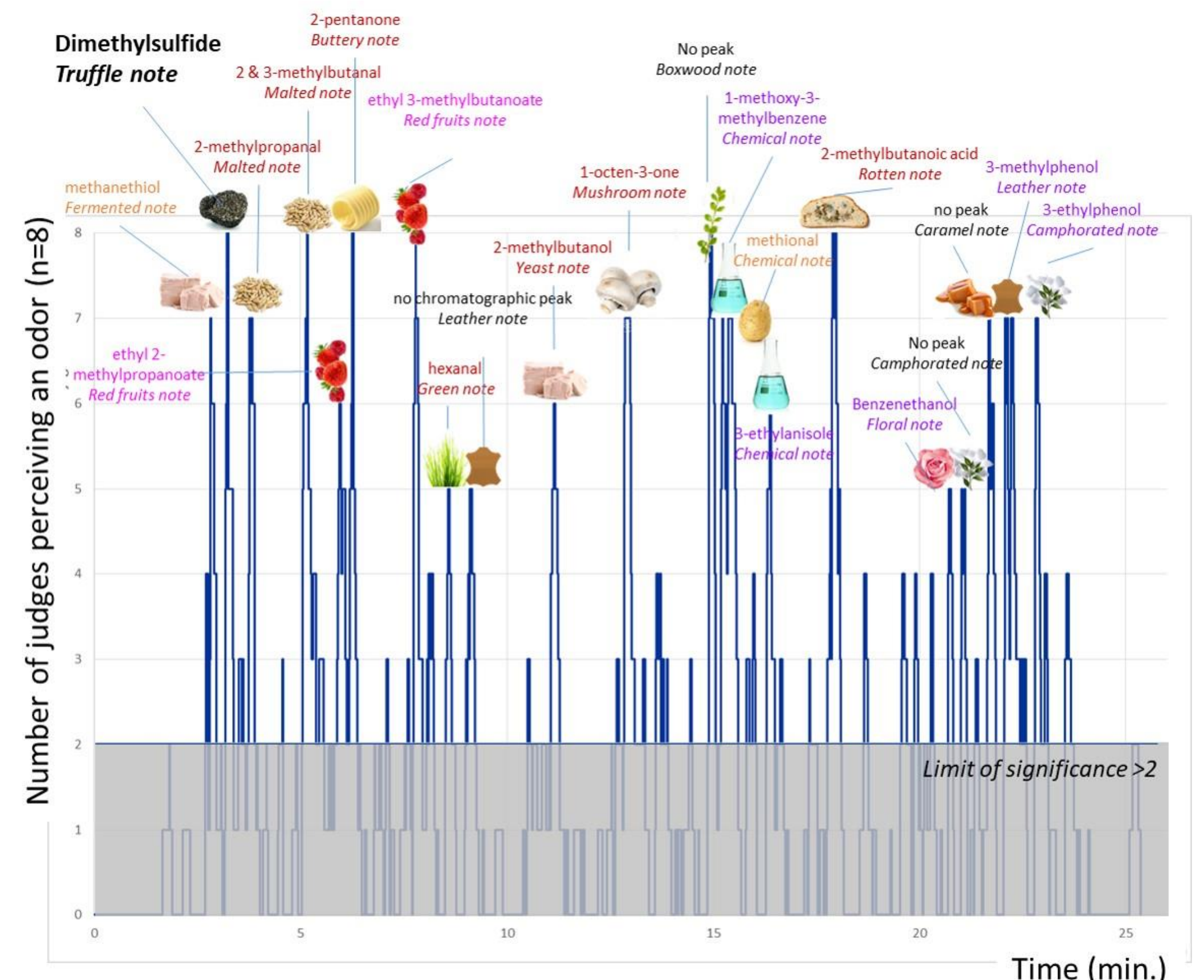
Preservation processes and aging times tested

- F-40**: Freezing at -40°C. Day 1-2 (D1-2).
- RF -20**: Rapid Freezing at -20°C. D1-2.
- AEO**: Preservation under Enriched Oxygen Atmosphere. D1-2, D13-14.
- PO**: Preservation at 0°C in melting ice. D1-2, D13-14.
- SF**: Preservation under Smart Fresh process. D1-2, D13-14.
- Control**: Truffle aroma without preservation process, D1-2, D6-7, D10-11, D13-14.

Sample analysis



Odorant volatolome of Control fresh Truffle (D1-2)



The odorant volatolome of fresh truffle is characterized by 44 odorant volatiles. It is dominated by alcohols bringing animal notes, carbonyl compounds (fermented, malted or vegetal notes), compounds containing an aromatic ring (chemical notes), esters (fruity notes) and sulphur compounds. Among them, dimethylsulfide brings a typical truffle note.

Evolution of odorant volatolome through aging and processes

- The aging of truffles is characterized by a decrease of methanethiol, 3-methylphenol and 3-ethylanisole and an increase of ethyl 2-methylbutanoate.
- Freezing processes dramatically changed the odorant profile of truffles increasing its aldehydes content.
- After 2 weeks of preservation, the Smart Fresh process seems to be the one which degrades the least the odorant volatolome of the truffles.
- However, it does not prevent the evolution of the volatolome of the freshly harvested truffle.

