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# GC-C-IRMS AND $_1$H-NMR CHARACTERIZATION OF SYNTHETIC BIS(METHYL-THIO)METHANE IN TRUFFLE FLAVORINGS

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*Tuber magnatum* (white truffle), *Tuber aestivum* (summer truffle), and Tuber *melanosporum* (black truffle) are the most well-known species belonging to the genus Tuber F.H.Several reports have considered the constituents responsible for the typical aroma and have also studied the quantitative and qualitative fluctuations of these compounds, depending upon truffle type and geographical origin [1-5]. The corresponding naturally-occurring identical compound, easily synthesized by the petroleum oil industry and supported in olive oil, is used as a flavoring agent for truffle flavored food products. Among the "white truffle-like" flavored foods, extra virgin olive oil, flavored with bis(methyl-thio)methane (BMTM), used as a seasoning occupies the most important position in the market. The largely distributed flavored seasoning offered an opportunity to characterize the synthetic BMTM by Isotope Ratio Mass Spectrometry (IRMS) and Proton Nuclear Magnetic Resonance (1H-NMR) spectroscopy. Analysis by GC-C-IRMS of various samples of synthetic BMTM from different origins allowed the investigation of the global δ 13C values. Analysis by 1H NMR of a synthetic standard and of a "white truffle-like" flavor consisting of synthetic BMTM as the principal component allowed the investigation of the isotopic distribution of 13C/12C ratio in two characteristic sites of this molecule. An easily produced extract using methanol-d4 allowed the identification and the characterization of BMTM available in "white truffle-like" flavorings distributed on the specialized flavorings market as synthetic BMTM supported in olive oil. The data reported in this paper are the first GC-C-IRMS and 1H NMR contributions to the characterization of synthetic BMTM available on the flavoring market and in "white truffle" flavors used to prepare the seasoning produced by dilution of BMTM in olive oil. Here, the behavior of 3D printed chitosan (CH) or CH/hyaluronic acid-based scaffolds was explored in terms of mechanical, morphological properties, and adsorbing properties of low molecular weight molecules and proteins contained in Dulbecco's modified medium High Glucose (DMEM) and bovine fetal serum (FBS), as a function of the gelation process. Scaffolds were made by a home-made 3D cryo-printing process from formulations with different concentrations of chitosan and chitosan and hyaluronic acid, gelled in 1.5 M potassium hydroxide, 1.5 M sodium carbonate or 28% w / v ammonia vapors. The water content of the scaffolds together with their mechanical strength and SEM morphological analyzes were evaluated. Finally, absorption tests were performed in order to qualitatively and qualitatively evaluate which substances the scaffold absorbs from the fetal bovine serum and the medium DMEM High Glucose. The analysis conducted by triple quadrupole and high resolution Orbitrap mass spectrometry, revealed that the scaffolds are able to absorb biological molecules present in medium and serum, and electrostatic interactions are the main driving forces. Furthermore, molecules presenting an aromatic ring or a sulfur group exhibited a preferred interaction pathway with the CH/HA scaffolds. The results as a function of the scaffold properties were presented and discussed.

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