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MEETING ABSTRACT OP

First global quantification of the compound DMB in olive oil and the first, documentation in Greece and Türkiye: Beneficial contribution to human health

Apostolos Kiritsakis[1*], Charalampos Anousakis[2] and Ahmet C. Gören[3,4]

[1]International Hellenic University, International Observatory of Oxidative Stress in Agrifood and Health, Thessaloniki, Greece
[2]Departments of Nutrition & Dietetics Sciences, Hellenic Mediterranean University 2nd km Sitia-Palekastro, 72300 Sitia, Crete, Greece
[3]Gebze Technical University, Graduate School, 41400, Gebze, Kocaeli, Türkiye
[4]Troyasil HPLC Column Technologies, Doruk Analitik, Mehmet Akif Mah. Yumurcak Sok. No, 43 Ümraniye İstanbul, Türkiye

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Abstract: This study focuses on sharing the key points of our group's recent work on the determination of 3,3-dimethyl-1-butanol (DMB) in olive oil, and on the effects of DMB on human health. The analysis of DMB used the Headspace gas chromatography–mass spectrometry (GC–MS) method, which ensured high sensitivity and reliability. The target compound was successfully quantified in olive oil samples from Greece and Türkiye. The highest concentration of DMB (11.4 µg/L) was recorded in a multi-varietal organic extra virgin olive oil produced from Sparta region of Greece and Kırkağaç region of Türkiye as 8.8 µg/L (Kiritsakis et al., 2025). The research also recorded, in earlier studies, a progressive reduction of phenolic compounds during olive fruit ripening, highlighting the importance of selecting the appropriate harvest time to preserve olive oil's bioactivity. Olive oil polyphenols possess internationally recognized biological activity and are the subject of an approved health claim within the European Union. DMBis of particular interest as a bioactive molecule because it inhibits the microbial enzyme TMA-lyase, which is involved in forming trimethylamine (TMA) and its metabolite trimethylamine N-oxide (TMAO), a compound associated with atherosclerosis and increased cardiovascular risk, among other adverse effects on the human body. Experimental studies in animal models indicate that DMB may reduce TMAO levels, limit atherosclerotic plaque formation, and contribute to regulating vascular inflammation, hypertension, and neurodegenerative diseases. Olive oil phenolic compounds, such as hydroxytyrosol, tyrosol, and oleuropein derivatives, exhibit strong antioxidant and anti-inflammatory activity, reducing oxidative stress, increasing telomere length, and contributing to slowing the aging process. The presence of DMB combined with phenolic constituents enhances the nutritional and functional value of olive oil, highlighting it as an important functional multiple benefits for human health.

Keywords: 3,3-Dimethyl-1-butanol (DMB), olive oil, phenolic compounds, cardiovascular health, functional food

ORCID

Apostolos Kiritsakis: 0009-0007-7140-1206
Charalampos Anousakis: 0009-0007-0181-2579
Ahmet C. Gören: 0000-0002-5470-130X

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*Corresponding Author: Apostolos Kiritsakis.
Email: kyritsak@gmail.com
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