

Investigation and quantification of the potential antioxidant, inflammatory, and antibacterial bioactive molecules of the extracts of Algerian black and green table olive brine

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Abstract

The table olive industry produces a large amount of wastewater that can be expensive to be treated and harmful to the environment. This study aimed to find a way to reuse brine water from the production of black and green table olive brines from Bejaia and Mascara of the Sigoise cultivar in order to create a valuable byproduct and contribute to sustainable development. In this context, the high-performance liquid chromatography–diode-array detection (HPLC-DAD) analysis revealed the highest concentration of hydroxytyrosol (4-(2-dihydroxy phenyl ethanol); 69.67 mg/100 mg) for green table olive brines of Mascara (EOGM) and tyrosol (Ty) (28.8 mg/100 mg) for black table olive brines of Bejaia (EOBB). Presence of polyphenols and ortho-diphenols could be responsible for their antioxidant, anti-inflammatory, and antibacterial properties. To assess antioxidant activity, the scavenging effects of DPPH (2,2-diphenyl-1-picrylhydrazyl) and ABTS (2,20-Azinobis[3-ethylbenzothiazoline-6-sulfonate]) radicals as well as hydrogen peroxide (H₂O₂) radicals were used. The antimicrobial activity showed that the black olive extract exhibited the best inhibitory effect, with a minimum inhibitory concentration (MIC) ranging from 0.625 mg/mL to 0.31 mg/mL. The anti-inflammatory activity of tested extracts of black olives of Bejaia (EOBB) and green of olives Mascara (EOGM) was 20.06 µg/mL and 20.21 µg/mL, respectively, which demonstrated the anti-inflammatory effect of these extracts on human beings.

Keywords: table olive; polyphenols; ortho-diphenols; HPLC-DAD; hydroxytyrosol; antioxidants; activity

Introduction

The olive tree (*Olea europaea* L.) is a spreading species native to the Mediterranean region. Even though the olive tree's fruits are mostly used to make high-quality olive oil, 11% of them are processed into table olives for immediate consumption. For the Mediterranean people, this food being of great nutritional value serves not only

as a source of calcium during times of scarcity but also as a means of survival. In Algeria, cultivation of olive occupies about 470,000 hectares of area and produces about 700,000 tons of olives (MARDE, 2017). The Sigoise variety olive of Tlemcen in Algeria, or olive of Tel, occupies 25% of the Algerian olive orchard. This variety is used mainly to produce excellent preserved green or black olives, with about 50 kg/tree production.