عنوان مقاله:

Antioxidant capacity, antimicrobial activities and chemical composition of Pistacia atlantica subsp. kurdica essential oil

محل انتشار:

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خلاصه مقاله:

This study aimed to evaluate the composition, antioxidant capacity and antibacterial effects of Pistacia atlantica subsp. kurdica (baneh) essential oil on some important bacteria in food safety. Essential oil was derived using hydro-distillation method of the baneh fruits. Essential oil composition was determined using gas chromatography–mass spectrometry. The ۲,۲′-azinobis-(۳-ethylbenzothiaziline-۶-sulfonate; ABTS) and ۲,۲-diphenyl-۱-picrylhydrazyl (DPPH) methods were used to evaluate antioxidant activity and Folin-Ciocalteu method was used to determine total phenolic content of essential oil. The antibacterial effect of the essential oil against six pathogen bacteria was determined using minimum inhibitory concentration, minimum bactericidal concentration and disc diffusion methods. Monoterpene and sesquiterpene hydrocarbons were main compounds of total identified constituents in the essential oil (approximately ۹۳.۵۰% and ۵.۴۵%, respectively). The main compounds were α-pinene, myrcene, limonene, β-pinene and γ-terpineol, respectively. The mean concentration of essential oil providing ۵۰.۰۰% inhibition was ۷.۵۴ ± ۰.۰۱ mg mL-۱. Dose-dependent and scavenging activities were seen in DPPH and ABTS tests and total phenolic content within test range of concentrations (۰.۰۶۲۵ to ۴.۰۰ mg mL-۱). The highest DPPH radical scavenging activity (۴۸.۶۷ ± ۰.۸۴%) was seen at a concentration of ۴ mg mL-۱. The responses of essential oil concentrations to ABTS assay were quite similar to the DPPH reaction, especially in higher concentrations. Both antimicrobial methods demonstrated that the essential oil had broader antibacterial effects against the Gram-positive bacteria than the tested Gram-negative bacteria. Essential oil of Pistachia atlantica subsp. kurdica can be one of the performing essential oils to be used as a preservative in food industry to increase food safety and reduce food pathogens risks.

کلمات کلیدی:

Antibacterial activity, Disc diffusion, Radical scavenging activity, Minimum inhibitory concentration