

Title Combined effect of vacuum-packaging and oregano essential oil on the shelf-life of Mediterranean octopus (*Octopus vulgaris*) from the Aegean Sea stored at 4 °C

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Abstract

The present study evaluated the use of vacuum packaging (alone) or with addition of oregano essential oil (EO), as an antimicrobial treatment for shelf-life extension of fresh Mediterranean octopus stored under refrigeration for a period of 23 days. Four different treatments were tested: A, control sample; under aerobic storage in the absence of oregano essential oil; VP, under vacuum packaging in the absence of oregano essential oil; and VO1, VO2, treated samples with oregano essential oil 0.2 and 0.4% (v/w), respectively, under VP. Of all the microorganisms enumerated, *Pseudomonas* spp., H₂S-producing bacteria and lactic acid bacteria (LAB) were the groups that prevailed in octopus samples, irrespective of antimicrobial treatment. With regard to the chemical freshness indices determined, thiobarbituric acid (TBA) values were low in all octopus samples, as could have been expected from the low fat content of the product. Both trimethylamine nitrogen (TMA-N) and total volatile basic nitrogen (TVB-N) values of oregano treated under VP octopus samples were significantly lower compared to control samples during the entire refrigerated storage period. Based primarily on sensory evaluation (odor), the use of VP, VO1 and VO2 extended the shelf-life of fresh Mediterranean octopus by ca. 3, 11 and 20 days, respectively.