Title Effect of thyme essential oil and packaging treatments on fresh Mediterranean swordfish fillets during storage at 4 °C

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Citation Food Chemistry, Volume 115, Issue 1, 1 July 2009, Pages 169-175

Keywords Swordfish; Packaging; Thyme oil, essential oils, natural antimicrobials; Shelf-life

Abstract

The present study evaluated the effect of thyme essential oil and packaging on fresh Mediterranean swordfish fillets during storage at 4 °C. Treatments in the present study included the following: air (A), modified atmosphere packaging (M), air with thyme oil (AT) and MAP with thyme oil (MT). Of the physicochemical parameters examined, TBA values for A and M swordfish samples were variable, indicative of no specific oxidative rancidity trend, whereas MT treatment inhibited lipid oxidation in swordfish samples during storage. On the basis of microbiological and sensory data, TMA-N and TVB-N limit values of acceptability for Mediterranean swordfish, of ca. 3.72 and 24.5 mg N/100 g, for the initiation of fresh Mediterranean swordfish spoilage, may be proposed. Of the treatments used in the present study, MT and M were the most effective for the inhibition of pseudomonads and H_2S-producing bacteria in swordfish. Lactic acid bacteria and *Enterobacteriaceae* (to a lesser extent) were also found to be part of the natural microbial flora of swordfish, irrespective of packaging treatment. Based primarily on sensory data, the shelf-lives of fresh refrigerated Mediterranean swordfish were 8 and 13 days under aerobic and MAP conditions, respectively. Addition of 0.1% thyme essential oil extended the product's shelf-life under aerobic conditions by 5 days, whereas the combination of MAP and thyme oil resulted in a significant shelf-life extension of the swordfish fillets, i.e. by approximately 7½ days, according to sensory data, as compared to the control sample.