Effect of aqueous extract of myrtle leaves (*Myrtus communis*) on quality changes of farmed gutted rainbow trout (*Oncorhynchus mykiss*) during chilled (4±1°C) storage

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Abstract

Rainbow trout fish is highly susceptible to microbial and hydrolytic spoilage as well as oxidative rancidity. Therefore, it is essential to use preservatives to extend the shelf life of this product. Myrtle Leaf extract has significant antibacterial and antioxidant properties. This research conducted to investigate the effect of aqueous extract of myrtle *(Myrtus communis*) leaves on farmed rainbow trout fish (*Oncorhynchus mykiss*) quality during chilled (4 ±1°C) storage. The amounts of total phenolic compounds through Folin-Ciocalteu method, free radical scavenging by DPPH solution and metal scavenging ability of the extract through spectrophotometric method, were determined. Rainbow trout have been washed and gutted immediately after fishing. Then, with regard to primary tests results, samples were immersed in aqueous extract of myrtle leaves with concentration of 0.5% for 5 minutes. Sampling has been done at days 0, 5, 10 and 15 during chilled (4 ±1°C) storage. Antimicrobial effects of mentioned extract were evaluated by enumeration of psychrophilic bacterial counts through the pour plate method, using PCA. Furthermore, the effects of extract on chemical properties of samples have been investigated through, pH measurement, spectrophotometric evaluation of TBARS and TVB-N content determination using Kjheldal method. Sensory evaluation determined by 10 trained panelists who were asked to evaluate the appearance and color, odor, texture and eye appearance of the samples. Total phenolic compounds, free radical scavenging (IC50) and metal scavenging ability of aqueous extract of myrtle were 49.6±0.33 mg GA/ml, 20±0.03 µg/ml and 0.042 mg/ml, respectively. Dipping the fish in the aqueous extract reduced the psychrophilic bacterial count immediately after the treatment and significantly retarded the microbial deterioration of treated fishes. So that, the psychrophilic bacterial count of control and treated samples on day 10 of storage were, 7.29 and 5.91 log cfu/g respectively. Moreover, lipid oxidation and production of volatile nitrogen compounds reduced in treated samples and sensory characteristics improved compared to control samples. Thus, the myrtle aqueous extract can be used to extend the shelf life of rainbow trout during chilled storage. The use of water as a solvent, the low required concentration of extract and abundance of evergreen myrtle bushes in Iran, provides the possibility of economic use of this extract as a natural preservative and suitable substitute for chemical compounds.

Keywords: *Oncorhynchus mykiss, Aqueous extract, Myrtle leave, Natural preservative.*

Professional Biography

Elham Nairi has completed her MSc at the age of 27 years from Food Technology Department of Shiraz University and performing her PhD in Technology of Food Science in Tabriz University. She was a Teaching Assistant in Sarvestan Azad University for 2 years and has been a research assistant in FAU University of Erlangen (Germany) since 2017. She has published 3 papers in reputed journals and presented one speech and 20 papers in valid congress.



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