

Quality enhancement in chilled palm ruff (*Seriolella violacea*) by previous high-pressure treatment: Effect of pre- and post-rigor mortis conditions

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PRESENTATION OF THE WORK

During fish chilled storage, relevant deterioration of sensory quality and nutritional value has been detected as a result of chemical constituent changes. Among the different advanced technologies to be applied for marine food preservation, high-pressure (HP) processing has been reported to inactivate microbial and endogenous enzymes, while leading to a shelf life increase during a further storage. The present work was focused on quality changes of chilled fish that was previously treated with HP technology. For it, palm ruff (*Seriolella violacea*) (Fig. 1) was chosen as being an abundant small pelagic species, normally considered as an unconventional source of raw material. This pelagic species is widely present in coastal or near coast regions located in temperate eastern Pacific (from Colombia to Chile). As previous HP treatment, two different pressure levels (450 and 550 MPa) for 3 min were tested and compared to untreated fish (Control). Additionally, fish corresponding to pre- and post-rigor mortis (RM) catching conditions were taken into account and compared. The study was addressed to chemical constituent changes (i.e., lipids, nucleotides and volatile amines), being analyses carried out after 10 and 12 days of chilled storage. Experiments were carried out in triplicate ($n=3$).

Fig. 1: *Seriolella violacea*



Fig. 2: Free fatty acids

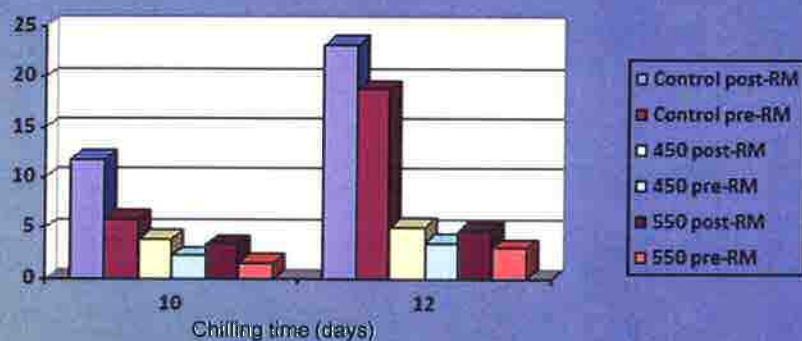
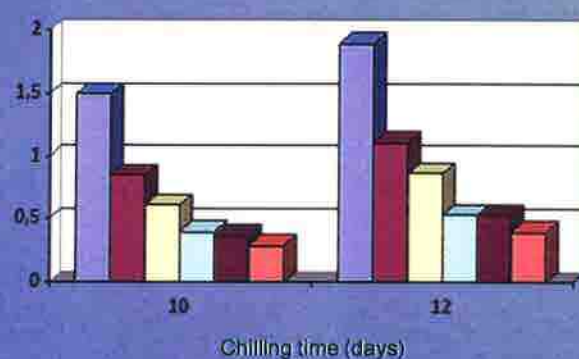


Fig. 3: Fluorescence ratio



RESULTS

An inhibitory effect on the quality loss could be observed in all HP-treated samples (pre- and post-RM) when compared to control fish at both chilling times. Thus, both HP batches (corresponding to 450- and 550-MPa pressure levels) indicated an inhibitory effect ($p<0.05$) on lipid hydrolysis (free fatty acids formation, FFA, g/100g lipids; Fig. 2) and oxidation (fluorescence ratio, FR, Fig. 3) development, and lower ($p<0.05$) total volatile base-nitrogen (mg/100g muscle; Fig. 4) contents and K values (%; Fig. 5) when compared with previously untreated chilled fish. In most cases, an increasing effect was implied by increasing the pressure level applied. Comparison between pre- and post-RM samples showed a higher quality retention in pre-RM fish in agreement with the assessment of lipid hydrolysis (FFA content; Fig. 2) and oxidation (FR value; Fig. 3) and autolysis (K value assessment; Fig. 5). As a result, present research shows that previous HP treatment has led to a marked quality enhancement of chilled palm ruff. Furthermore, the employment of this species in pre-RM catching condition would be recommended.

Fig. 4: Total volatile base-nitrogen

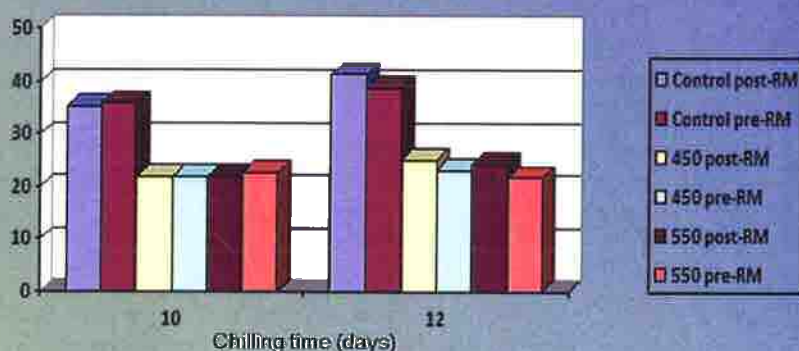


Fig. 5: K value

