Removal of Allergens from Fish Infected with Anisakis simplex Larvae in the Washing Process of Surimi Production

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Most of the commercial species of marine fish and cephalopods are infected with Anisakis L3 larvae, degrading the product and causing big economic losses to the fishing industry as food safety and quality issues related to parasites in seafood are growing worldwide. Human diseases due to eating fish parasitized with anisakid larvae represent one of the most important health problems related to fish parasites nowadays. The ingestion of infected fish may cause infection to the consumer by the live larvae when consuming raw or undercooked fish that do not kill the larvae and also allergy due to sensitization by ingesting the live larvae or the allergens excreted/secreted by the larvae into the fish muscle.

Freezing and heating fish muscle at certain temperature conditions kill the larvae avoiding human infection. However part of the known Anisakis simplex s.s. allergens are extremely resistant to heat and freezing treatments, therefore allergic consumers often have to exclude fish from their diet. Moreover, the visual detection of larvae in fish muscle causes rejection of the fish at purchasing.

The object of the work was to know if allergenic proteins are removed in the washing process to obtain surimi from fish infected with Anisakis simplex [A. simplex s.s. (97.15%) and A. simplex s.s. and A. pegreffii hybrids (2.85%)] L3 larvae.

Artificially infected minced hake muscle (50 L3 larvae/100g mince) was washed in a pilot plant (3 cycles washing-decanting) with water or different solutions (1:4; w:v). Anis 4 and Anisakis simplex antigens were quantified by immunodetection (Dot blot) in the three solutions recovered in each washing step (Sn) and the final washed muscle.

The results indicate that both types of allergens were removed in the 3 washing steps, even when the total protein in the recovered washing solutions decreased. This approach opens a line to utilize parasitized fish in a safer way.

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