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Kinetic properties and characterization of purified proteases from Pacific whiting (*Merluccius productus*)

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AN ABSTRACT OF THE THESIS OF

JiYun Wu for the degree of *Master of Science*, in *Food Science and Technology*, presented on *March 10, 1994*.

Title: *Kinetic Properties and Characterization of Purified Proteases from Pacific Whiting (*Merluccius productus*)*.

Abstract approved _____

Hayley An

Kinetic properties of the two proteases, causing textural degradation of Pacific whiting (*Merluccius productus*) during heating, were compared and characterized with the synthetic substrate, Z-Phe-Arg-NMec. Pacific whiting P-I and P-II showed the highest specificity on Z-Phe-Arg-NMec, specific substrate for cathepsin L. The K_m of preactivated P-I and P-II were 62.98 and 76.02 (μ M), and k_{cat} 2.38 and 1.34 (s^{-1}) against Z-Phe-Arg-NMec at pH 7.0 and 5.0, respectively. Optimum pH stability for preactivated P-I and P-II is between 4.5 and 5.5. Both enzymes showed similar pH-induced preactivation profiles at 30°C. The maximal activity for both enzymes was obtained by preactivating the enzyme at a range of pH 5.5 to 7.5. The highest activation rate for both enzymes was determined at pH 7.5. At pH 5.5, the rate to reach the maximal activity was the slowest, but the activity was stable up to 1 hr. P-I and P-II






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Resource Type	Masters Thesis
Date Available	2012-01-26T18:37:41+00:00
Date Issued	1994-03-10
Degree Level	Master's
Degree Name	Master of Science (M.S.)
Degree Field	Food Science and Technology 
Degree Grantor	Oregon State University 
Commencement Year	1994
Advisor	An, Haejung
Academic Affiliation	Food Science and Technology 
Non-Academic Affiliation	Oregon State University. Graduate School 
Subject	Pacific hake -- Carcasses Pacific hake -- Composition Proteolytic enzymes
Rights Statement	Copyright Not Evaluated 
Publisher	Oregon State University
Peer Reviewed	No
Language	English [eng]

Attribute Name	Values
Digitization Specifications	File scanned at 300 ppi (Monochrome) using Scamax Scan+ V.1.0.32.10766 on a Scanmax 412CD by InoTec in PDF format. LuraDocument PDF Compressor V.5.8.71.50 used for pdf compression and textual OCR.

Replaces <http://hdl.handle.net/1957/27168>

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Texture properties were obtained from Warner-Blatzler shear measurement using a Texture Analyser (TA-TX2). The activities of protease were measured using Zhe-Phe-Arg-7-amido-4-methylcoumarin as a substrate. The lipid oxidation in fish fillet was evaluated by determination of thiobarbituric acid reactive substances (TBARS). High cathepsin L protease activity. Pacific whiting, (*Merluccius productus*). Total catch in 2014, 206 MT. Cathepsin L protease activity was measured with Zhe-Phe-Arg-7-amido-4-methylcoumarin. Previous. Next. Sustainably harvested and MSC certified, from waters off Oregon and Washington, Pacific Seafood's Pacific whiting is the most abundant fish resource off the West Coast, and one of the best seafood values around. Every spring huge schools of whiting are harvested by trawlers and delivered to processing facilities where they are headed and gutted, filleted, or processed into high grade surimi. This clean tasting, white meat is easily adapted to a variety of applications, from fish and chips to pan frying or baking. Alaska pollock (*Theragra chalcogramma*) and Pacific hake (*Merluccius productus*) the most commonly used fish species for surimi production in the United States and Canada. Nowadays, around 60% of world surimi is produced in Southeast Asia using threadfin bream (*Nemipterus* sp.) and other tropical fish species. A diversity of studies dealing with the evaluation of functional properties of hydrolysates from seafood and fishery by-products has been performed, suggesting that amino acid composition and degree of hydrolysis are among the most important factors to take into account for their functionality.

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