

Deproteinization of Moroccan Sardine (*Sardina pilchardus*) Scales: A Pilot-Scale Study

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Abstract : In Morocco, fish processing industry is an important source income for a large amount of by-products including skins, bones, heads, guts, and scales. Those underutilized resources particularly scales contain a large amount of proteins and calcium. *Sardina pilchardus* scales from resulting from the transformation operation have the potential to be used as raw material for the collagen production. Taking into account this strong expectation of the regional fish industry, scales sardine upgrading is well justified. In addition, political and societal demands for sustainability and environment-friendly industrial production systems, coupled with the depletion of fish resources, drive this trend forward. Therefore, fish scale used as a potential source to isolate collagen has a wide large of applications in food, cosmetic, and biomedical industry. The main aim of this study is to isolate and characterize the acid solubilize collagen from sardine fish scale, *Sardina pilchardus*. Experimental design methodology was adopted in collagen processing for extracting optimization. The first stage of this work is to investigate the optimization conditions of the sardine scale deproteinization on using response surface methodology (RSM). The second part focus on the demineralization with HCl solution or EDTA. And the last one is to establish the optimum condition for the isolation of collagen from fish scale by solvent extraction. The advancement from lab scale to pilot scale is a critical stage in the technological development. In this study, the optimal condition for the deproteinization which was validated at laboratory scale was employed in the pilot scale procedure. The deproteinization of fish scale was then demonstrated on a pilot scale (2Kg scales, 20l NaOH), resulting in protein content (0,2mg/ml) and hydroxyproline content (2,11mg/l). These results indicated that the pilot-scale showed similar performances to those of lab-scale one.

Keywords : deproteinization, pilot scale, scale, sardine pilchardus

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