

Optimization of Gelatin Extraction from Thai Fish Panga (*Pangasius bocourti* Sauvage) Skin

Trakul Prommajak and Patcharin Raviyan*

Department of Food Science and Technology, Faculty of Agro-Industry, Chiang Mai University, Chiang Mai 50100, Thailand

*Corresponding author. E-mail: p.charin@chiangmai.ac.th

ABSTRACT

*An investigation on optimal conditions for gelatin extraction from the Thai fish panga (*Pangasius bocourti* Sauvage) skin was performed by response surface methodology. A Box-Behnken design was applied to examine the effects of extraction temperature (40-70°C), pH (3.7-7.4) and extraction time (1-5 h) on gelatin yield, gel strength and gel colour. All regression models were significant ($P \leq 0.01$) and lack-of-fit of the models was insignificant, except for that of the gel strength. The Anderson-Darling normality test of the standardized residuals showed adequacy of all models. The optimal conditions for gelatin extraction were at 55°C, pH 4.55 for 1 h. The predicted responses were 20.22% gelatin yield, 506.55 g gel strength, 42.22 lightness (L^*), 3.56 chroma (C^*) and 43.35° hue angle (h°). The experimental responses of gelatin extracted at the optimal conditions were not significantly different ($P > 0.5$) from the predicted value.*

Key words: Gelatin, Thai fish panga, Response surface methodology, Physical properties

INTRODUCTION

Gelatin is a biopolymer obtained from partial hydrolysis of collagen. It has been used in many fields such as food, pharmaceutical, photographic and cosmetic industries. In food industry, it has been used as a gelling agent and an edible film. Gelatin can also promote healthy bones, joints and skin (Kasankala et al., 2007; Rahman et al., 2008).

Gelatin was previously extracted from bovine or swine skin or bones. However, since bovine spongiform encephalopathy (BSE) and foot-and-mouth disease had occurred, consumer became hesitant to eat food derived from these terrestrial animals. Fish are then an alternative source for gelatin production. Although it was reported that the bloom strength of fish gelatin was lower than that of bovine or swine gelatin, pretreatment of skin with saline or hydrogen peroxide solution could increase the bloom strength of fish gelatin (Giménez et al., 2005; Aewsiri et al., 2009).

The Thai fish panga (*Pangasius bocourti* Sauvage) is a new economic fish that has been promoted to be cultured in areas along the Mae Khong shore