

Article

Production of Chondroitin Sulphate from Head, Skeleton and Fins of *Scyliorhinus canicula* By-Products by Combination of Enzymatic, Chemical Precipitation and Ultrafiltration Methodologies

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Abstract: This study illustrates the optimisation of the experimental conditions of three sequential steps for chondroitin sulphate (CS) recovery from three cartilaginous materials of *Scyliorhinus canicula* by-products. Optimum conditions of temperature and pH were first obtained for alcalase proteolysis of head cartilage (58 °C/pH 8.5/0.1% (v/w)/10 h of hydrolysis). Then, similar optimal conditions were observed for skeletons and fin materials. Enzymatic hydrolysates were subsequently treated with a combination of alkaline hydroalcoholic saline solutions in order to improve the protein hydrolysis and the selective precipitation of CS. Ranges of 0.53–0.64 M (NaOH) and 1.14–1.20 volumes (EtOH) were the levels for optimal chemical treatment depending on the cartilage origin. Finally, selective purification and concentration of CS and protein elimination of samples obtained from chemical treatment, was assessed by a combination of ultrafiltration and diafiltration (UF-DF) techniques at 30 kDa.

Keywords: chondroitin sulphate production; cartilage *S. canicula* wastes; by-products upgrade; process optimization; response surface methodology
