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# Qualitative and Quantitative Comparison of Chitosan Isolated from Pharaoh Cuttlefish (*Sepia pharaonis*) Bone, Indian Squid (*Loligo duvauceli*) Pen and Tiger Prawn (*Penaeus monodon*) Exoskeleton

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## Abstract

Fish processing industry is a significant source for earning foreign exchange to Sri Lanka. Thus it plays a very important role in the country's economy. When considering the cuttlefish, squid and shellfish processing, hundreds of tonnes of waste are discarded and it has become a major environmental concern due to its slow degradation. The present study was designed to isolate the biopolymer: chitosan, from selected two cephalopod species *Loligo duvauceli* (Indian squid - Ln) and *Sepia pharaonis* (Pharaoh cuttlefish-Sp) and compare them qualitatively and quantitatively with previously isolated chitosan from *Penaeus monodon* (Giant tiger prawn -Pm). Pre-conditioning, De-mineralization, De-proteinization, De-colouration and De-acetylation steps were followed to isolate chitosan from the prawn shell, squid pen and cuttlefish bone. After extracting chitosan samples, the percentage of yield, physico-chemical and functional properties as moisture, ash, solubility, nitrogen, WBC, FBC and DD, and FT-IR reports were analyzed to compare the extracted chitosan samples. For the three species mentioned above, prawn (Pm), cuttlefish (Sp) and squid (Ld) yield was respectively 24.27%, 28.21% and 62.6%; moisture was respectively 7.52%, 8.33% and 9.27%; ash was respectively 0.65%,0.32% and 0.04%; Nitrogen was respectively 6.16%, 82.15% and 94.08%; solubility was respectively 15.28%, 34.73% and 52.17% ; WBC was respectively 600.61%, 673.27% and 705.21% and also FBC in coconut oil was respectively 644.15%,767.84% and 853.42%. in sunflower oil was respectively 556.53%, 602.45% and 678.23, and in soybean oil was respectively 65.21%, 637.21% and 778.65%. Among the three chitosan samples, chitosan isolated from the pen of *Loligo duvauceli* (Indian squid) was of best quality and was better than chitosan isolated from *Penaeus monodon* exskeleton. Possibility of using cephalopod and prawn waste to produce good qulity chitosan is evident from the results and it could be a good solution to reduce the environmental hazards caused by fih processing waste. Low cost techniques should be adopted to isolate chitosan, from fish processing waste, which should be considrred as a valuable resource for production of chitosan having many important industrial applications.

***Key words:*** *Chitosan, Loligo duvauceli, Penaeus monodon, Sepia pharaonis*
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