D-46: Proximate composition of chitin and chitosan from shrimp exoskeleton

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Exoskeleton (waste heads and shells) from the shrimp industry is discarded. This waste contains chitin which is a valuable by- product. This project was designed to characterise chitin and chitosan extracted from exoskeleton of both cultured and wild-caught specimens of shrimp.

Method A used wet raw material digested by sodium hydroxide (NaOH), bleached with hypochloric acid and demineralized with hydrochloric acid (HCl) for the extraction of chitin. Method B used the dried raw material, treated with HCl followed by NaOH. Chitin extracted by the method with the higher yields and better quality was used to prepare chitosan. Proximate compositions of all the products were measured.

Chitin extracted by method A had a crude nitrogen content of 4.7%, ash 0.53%, moisture 4.2%, oil 3.5% and a yield of 14.2%. Chitin extracted by method B, had a crude nitrogen content of 6.1%, ash 0.37%, moisture 8.36%, oil 4.2% and a yield of 17.9%. The yield of chitosan was 85%. This had crude nitrogen 6.4%, ash 0.199%, moisture 5.8% and oil 5.1%. The extractions were the mean of 2 independent experiments each for the 2 varieties of shrimp. The results of parameters were the mean of 2 observations per variety of shrimp.

Method B gave a higher yield and better quality product (higher crude nitrogen and lower ash content). A significant difference ($P=0.05$) in yield or quality of chitin was not observed between the two shrimp varieties.