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Metal accumulation in *Mizuhopecten yessoensis* and purification of the related metal-binding proteins from digestive gland

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Marine pollution caused by heavy metals has become an increasing problem in recent decades and yet the mechanisms of detoxification in marine invertebrates remain largely unknown. Many researches have proved previously that metal-binding proteins called metallothioneins (MTs) play a key role in the biochemical detoxification of toxic metals. However, MTs from scallop *Mizuhopecten yessoensis* have not been reported. To understand whether *M. yessoensis* possesses MTs or some other metal-binding proteins, the scallops were exposed to artificial seawater containing Cd, Cu, or Pb for up to 10 days at different exposure period, the Cd, Cu and Pb concentrations in different tissues of scallops were measured by atomic absorption spectroscopy. Metalloproteins in the digestive gland were extracted by Tris-HCl (pH 8.6) and purified by cold acetone. The precipitations were further subjected to gel-filtration and followed by anion-exchange chromatography. Finally, the isolated proteins were characterized preliminary by amino acid sequence analysis. Results showed that the scallops accumulated higher concentration of Cd than Cu and Pb and most of metals were detected in the digestive gland. The metalloprotein profiles in digestive gland showed that some proteins were up-regulated after exposure and three of them with a molecular mass of about 25, 37 and 42 kDa were successfully isolated by gel-filtration and anion-exchange column chromatography. N-terminal amino acid sequences of them showed high similarity with some metal-binding proteins and ion-transporters. It is reasonable to assume that the mechanisms of metal accumulation and detoxification in *M. yessoensis* are related to these proteins. The primary structures analysis of the three proteins is now in progress.

Biography

Jialong Gao earned his Master Degree in Guangdong Ocean University of China and then worked in Food Science and Technology Department in the same university. Now, he is a Doctor Course Student of Applied Marine Biosciences Course in Tokyo University of Marine Science and Technology, Japan. He focuses on the accumulation and detoxification mechanisms of heavy metals in marine bivalves.

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