

Bioaccumulation of Arsenic Compounds in Aquacultural Clams (*Meretrix lusoria*) and Assessment of Potential Carcinogenic Risks to Human Health by Ingestion.

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摘要

Abstract

This study surveyed the total arsenic (As) and As species contents in clams (*Meretrix lusoria*) farmed in areas of hyperendemic blackfoot disease (BFD) in southwestern Taiwan. Total As and As species in sediment and pond water were also analyzed to examine the bioaccumulation of As in clams in their exposure environment. Moreover, potential carcinogenic risks associated with the ingestion of As in aquacultural clams were evaluated probabilistically. The average total As contents in medium-sized and small clams were 7.62 and 10.71 $\mu\text{g/g}$ (dry wt), respectively. The content of the As species in this study was approximately 61% of the total As content. The other unquantified As species are possibly arsenocholine, arsenosugar and arsenolipid. The average ratios of inorganic As contents to total As contents in clams ranged from 12.3% to 14.0% which are much higher than that found in the farmed oyster (*Crassostrea gigas*), indicating that humans may expose to larger quantities of inorganic As by ingesting the same amount of clam as oyster. Using different ingestion rates derived by the average consumption method and the questionnaire method, the estimated risks to human health associated with consuming clams from the BFD area ranging from slightly to largely exceed the standard target risk. Based on the estimation of the TR model, a 0.18 g/day-person of the safe ingestion rate of clams in the BFD region is recommended.