Bioaccumulation of Trace Metals in *Meretrix lyrata* near the Saigon-Dong Nai River Estuary, Vietnam

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Background/Objectives. High rate of urbanization and industrialization of provincial cities and Ho Chi Minh City (HCMC) resulted in serious water issues of Saigon-Dong Nai (SG-DN) River. The lyrate Asiatic hard clam *Meretrix lyrata* is one of the predominant commercial aqua-products exploited in southern Viet Nam. In filter-feeding organisms like the hard clam, the metal content of tissue can be highly dependent on environmental conditions such as sediment and suspended particulate matter (SPM) and on the physiological status of individuals. This study aims to determine trace metal bioaccumulation (Mn, Fe, Co, Ni, Cu, Zn, As, Se, Cd, Hg, and Pb) in the hard clam *Meretrix lyrata,* which feeds along the coastal areas near the Saigon-Dong Nai River estuary in southern Vietnam. There is a need to monitor trace metal bioaccumulation in the environment and tissues of *M. lyrata*, given that it is one of the most popular seafood items in Vietnam.

Approach/Activities. SPM, sediment and hard clam samples were collected monthly in dry, transition, and wet seasons of the Vietnam's southern area from March to September 2016. This study aims to collect samples at three sites: Can Thanh, Dong Hoa (Can Gio, Ho Chi Minh City), and Tan Thanh (Go Cong Dong, Tien Giang Province). The Can Thanh hard clam farm is famous for middle-size hard clams (12 to 18 months old), which are ready for consumption, as well as small-size clams (6 to 12 months old), which are sold to other farms. In contrast, all of the hard clam samples in Dong Hoa are drifting clams from local hard clam farms around this area. Can Thanh and Dong Hoa are located in the coastal area in the left side of SG-DN River estuary, Tan Thanh is in the other side. The Tan Thanh sampling site is closer to the Tien River estuary than the SG-DN River estuary. Almost all hard clams from Tan Thanh were large and over 12 months old. Metal concentrations (Mn, Fe, Co, Ni, Cu, Zn, As, Se, Cd, Hg, and Pb) in whole body, gills, digestive gland, and the remainder of hard clams, sediment, and SPM were analyzed to determine if specific clam tissues pose a health risk for consumers and there is any significant correlation between metals in clam and its living environment.

Results/Lessons Learned. The results showed that metal concentrations and biota-sediment accumulation factor (BSAF) in digestive gland or gills were higher than in the remainder. Pb, Mn, Fe, and Co did not accumulate in *M. lyrata* (BSAF values < 1), whereas the BSAF of Cd in sediment habitats used by these clams were highest (ranging from 5.44 to 444). Concentrations of almost all metals in hard clam tissues and SPM were highest in the transition or wet periods. The increased precipitation may mobilize metals from the terrestrial environment into the aquatic environment, and thereby increasing the exposure of clams to metals. In addition, the close correlation between metal concentrations in the hard clam and in its sediment habitat and SPM showed that this species of clam may be suitable for biomonitoring. The hazard quotient results of all studied trace metals in the hard clams for human health were within safe limit (ranging from 0.0002 to 0.0436). The daily consumption for local people of the lyrate Asiatic hard clam *M. lyrata* (including shell weight) should not exceed 777 g in Can Thanh, 843 g in Tan Thanh, and 760 g in Dong Hoa.