

# 琉球大学学術リポジトリ

## 東アジアにおけるハマグリ類の集団遺伝構造と外来種の侵入に関する研究

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## 論 文 要 旨

論 文 題 目 : Studies on population genetic structure and exotic invasion of *Meretrix* spp. in the East Asia.

Asian hard clams, genus *Meretrix* (Veneridae) are commercially important bivalves in the East and Southeast Asia and East Africa. To investigate genetic relationships among species of the genus *Meretrix*, allozyme analysis was conducted. Two cryptic or undescribed species, *Meretrix* sp. 1 from Okinawa and *M. cf. lusoria* (*Meretrix* sp. 2) from Taiwan were discovered.

We conducted species identification between *M. lusoria*, *M. petechialis*, and Taiwanese *Meretrix* sp. 2 by PCR-RFLP analysis (*HincII* and *AseI*) and amplification of the nuclear gene *ANT*. Exotic invasion of two *Meretrix* species were discovered in Japan; *M. petechialis* was found in Yoshinogawa, Tokushima Pref. and Kanonji, Kagawa Pref.; and one hybrid and two putative hybrids between *M. lusoria* and *M. petechialis* were found in Chichibugahama and Kanonji. As well, Taiwanese *Meretrix* sp. 2 was found from Nishinagisa on the north coast of Tokyo Bay, demonstrating the Taiwanese *Meretrix* sp. 2 now occurs in *M. lusoria* habitat. *Meretrix* seedlings from a Taiwanese aquaculture facility have been released into Nishinagisa since 2008, suggesting the Taiwanese *Meretrix* sp. 2 is inadvertently mixed with the *M. lusoria* produced in the aquaculture facility. If however, *M. petechialis* and Taiwanese *Meretrix* sp. 2 populations expand in the wild, they could replace the local *M. lusoria* and cause genetic disturbance via hybridization.

Allozyme analysis was conducted to assess the genetic diversity and structure of *Meretrix* spp. in Japan, South Korea, China, and Taiwan. Japanese *M. lusoria* exhibited a low allelic richness (*A*) and heterozygosity (*He*), and a bottleneck, and this low genetic diversity was caused by a drastic population decline throughout Japan after the 1960s. As a result, the degree of genetic differentiation among local Japanese *M. lusoria* localities was low except for Mutsu and Kashiwazaki populations. In the populations in the Sea of Japan, latitudinal clines were observed in allelic frequency and *He*. One-way gene flow between neighboring localities may explain these latitudinal clines. In the Pacific localities, the locations of samples were geographically distant but the degree of genetic differentiation was small. Large-scale seedling release between different localities could have influenced the genetic structure of Pacific *M. lusoria* populations.

In January 2006, a dead-shell assemblage including a number of *Meretrix* (*Meretrix* sp. 3) appeared at Sashiki tidal flat in Okinawa Is. From morphometric comparison, *Meretrix* sp. 3 is likely to be distinct from other congeneric species from Japan and Taiwan. Meanwhile, interviews and literature research indicates that local *Meretrix* (called Kirun) in Sashiki was facing its extinction in 1920s. Coastal environmental changes by US military forces around WW2 would have terminated any remaining *Meretrix* sp. 3 populations.

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