MITOCHONDRIAL DNA AND MORPHOLOGICAL IDENTIFICATION OF Crassostrea zhanjiangensis SP. NOV. (BIVALVIA: OSTREIDAE): A NEW SPECIES SYMPATRIC WITH THE HONG KONG OYSTER IN ZHANJIANG, CHINA

Xiangyun Wu*, Shu Xiao and Ziniu Yu

Key Laboratory of Marine Bio-resource Sustainable Utilization, South China Sea Institute of Oceanology, Guangzhou, China
xywu2007@scsio.ac.cn.

Species-richness of oysters is high in the coastal areas of China, and cultivation of Crassostrea oysters is one of the largest coastal industries in this country. Wild oyster spat collection is economical and is still extensively practiced in these areas. Guandu (Zhanjiang, Guangdong Province) is a prime location for seed production of the Hong Kong oyster (C. hongkongensis), the most commonly cultured oyster in southern China. On the basis of our field investigations in Guandu’s Hong Kong oyster aquaculture industry, and based on descriptions from experienced local oyster farmers, a common “adulterated oyster” for oyster farming, nicknamed the ‘cat ear oyster,’ appears to be sympatric with the Hong Kong oyster. The ‘cat ear oyster’ could potentially influence the efficiency of Hong Kong oyster spat collection due to niche competition on spat collection devices. Mitochondrial sequences and morphological features of cat ear oysters do not match those of any recorded Crassostrea species, indicating that the cat ear oyster represents a heretofore undescribed and genetically distinct Crassostrea species in China, C. zhanjiangensis. mtDNA sequence analyses unambiguously confirm its phylogenetic status as the most basal taxon of the Asian Crassostrea. A comparative study of the shell characteristics of C. zhanjiangensis, and other Crassostrea species reveals several distinctive morphological traits, including a generally smaller body size, a deeply cupped left valve, and a right valve that is convex in adults but flat in young individuals. Other distinctive features of the new species include life cycle traits that are unique compared to the sympatric C. hongkongensis and C. sikamea species, such as a higher growth rate in the fast-growth phase after settlement, followed by a significantly slower growth rate and mass mortality during subsequent life stages. This study provides the basis for future biological studies of C. zhanjiangensis and for strategic policy decisions regarding the conservation and management of oyster aquaculture.