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

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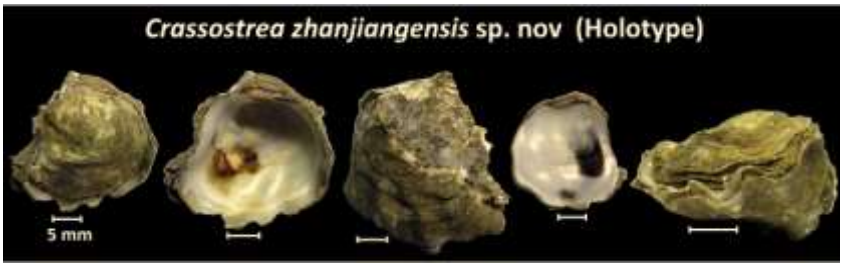
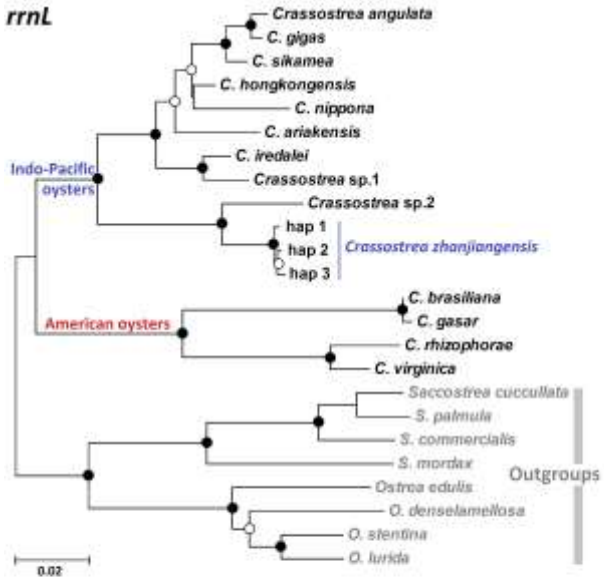
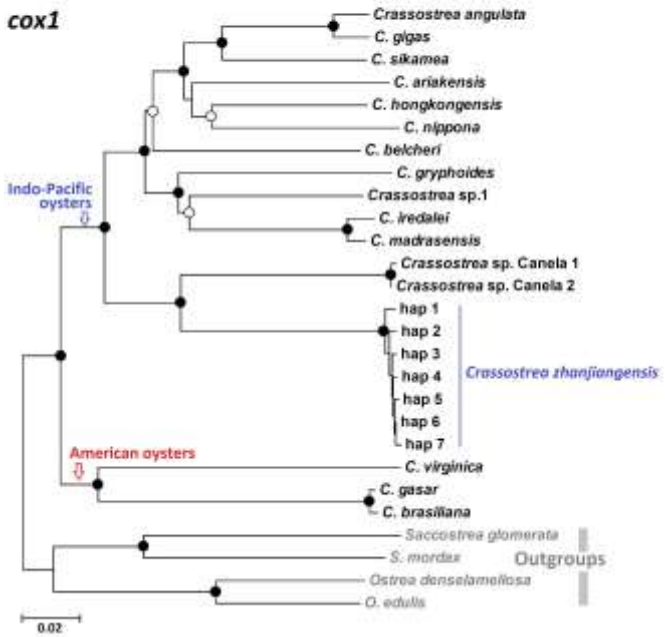
Species-richness of oysters is high in the coastal areas of China, and cultivation of *Crassostrea* oysters is one of the largest coastal industries in this country. Wild oyster spat collection is economical and is still extensively practiced in these areas. Guandu (Zhanjiang, Guangdong Province) is 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.




A
Guangdong Province
Guangxi Province
Beihai
Zhanjiang
Beibu Gulf
Guangxi
Hainan Province
South China Sea
B
C
D


rrnL
Crassostrea angulata
C. gigas
C. sikamea
C. hongkongensis
C. nippona
C. ariakensis
C. iredalei
Crassostrea sp.1
Crassostrea sp.2
hap 1
hap 2
hap 3
Crassostrea zhanjiangensis
C. brasiliana
C. gasar
C. rhizophorae
C. virginica
Saccostrea cucullata
S. palmula
S. commercialis
S. mordax
Ostrea edulis
O. denselamellosa
O. stentina
O. lurida
Indo-Pacific oysters
American oysters
Outgroups
0.02


cox1
Crassostrea angulata
C. gigas
C. sikamea
C. ariakensis
C. hongkongensis
C. nippona
C. belcheri
C. gryphoides
Crassostrea sp.1
C. iredalei
C. madrasensis
Crassostrea sp. Canela 1
Crassostrea sp. Canela 2
hap 1
hap 2
hap 3
hap 4
hap 5
hap 6
hap 7
Crassostrea zhanjiangensis
C. virginica
C. gasar
C. brasiliana
Saccostrea glomerata
S. mordax
Ostrea denselamellosa
O. edulis
Indo-Pacific oysters
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0.02