Marine bivalve Mollusca studies in China: A review[1]

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Исследование морских двустворчатых моллюсков в Китае: обзор

ХВАНГ БО, ЛИ СЯОХОН, СЮЙ ФЕНЬШАНЬ

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Marine bivalve Mollusca studies in China are developing widely, many achievements have been obtained such as taxonomic research, culture of economically important species of bivalve molluscs and genetic breeding studies.

1. The China Seas Bivalve Mollusca Database System

Many taxonomic research projects involved families of bivalve Mollusca: Nuculidae, Nuculanidae, Malletiidae, Tindariidae, Arcidae, Glycymerididae, Limopsidae, Mytilidae, Pteriidae, Isognomonidae, Vulsellidae, Malleidae, Pectinidae, Ostreidae, Limidae, Chamidae, Tridacnidae, Cuspidariidae.

In taxonomic marine bivalve studies 1047 species were identified in the China Seas for a database system constructed from the obtained database files that were essentially a set of tables in which the items are arranged in rows and columns [Huang Bo and Xu, 1966; Xu, 1997]. Each row is record consisting of a number of fields and each field is a column. There are two kinds of major data files in the database system, one is composed of taxonomic files, the another is geographical distribution file. The taxonomic files

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consist of the same family, in the file each record is a taxon: family, genus and species data, each column is scientific name, Chinese name, original papers, synonym, reported in China, location in China, distribution in the world. The columns of "location in China" report ecological environmental factors of species such as temperature, salinity, water depth etc., geographic distribution files are constructed of the same species in the same family, their record consists of families, genera and species, their columns consists of provinces name: Liaoning, Hebei, Shangdong, Jiangsu, Zhejiang, Fujian, Guangdong, Guangxi and Hainan or consists of Chinese Seas: Bohai Sea, Yellow Sea, East China Sea, South China Sea.

To compact the database system, the subsystems: inquiring, editing, statistics, printing, and plotting are designed. The inquiring subsystem allows the user to choose or get information from the screen, the printing subsystem can send the retrieved data to the printer. Editing subsystem can edit, browse, sort data and save the data as a text file that can then be used in other computer packages. The statistics of subsystem can group up and calculate data: e.g., some records and fields by user requirements. The plotting subsystem can plot some species distribution map by using GIS (geographic information system).

2. Marine Culture of Bivalve Mollusca in China

Many economically important species of bivalve molluscs are cultured in China [Shandong Ocean Institute, 1985]. There are three main culture models for different ecological type species in China: beach culture, shallow water raft culture and pond culture. The beach culture model is suitable for culturing Ruditapes philippinarum, Meretrix meretrix; the shallow water raft culture model is suitable for culturing Mytilus galloprovincalis, Pinctata martensi, Pinctata maxima, Crassostrea sp., Chlamys farreri, Argopected irradians etc.; the pond culture model is suitable for culturing *Tegillarca granosa, Sinonovacula constricta* etc. The culture ecology of these species is being studied e.g.: effect of temperature, salinity and another environmental factor on survival, energy reserves, metabolism, growth and development, etc. of these species.

Argopecten irradians was introduced to China from the U.S. in 1982. It has been cultured for 15 years. However, its many good characters have been lost in China such as high mortality, a tendency toward smaller size growth, decrease in yield per unit production and lower yield rate of adductor muscles. Disease is a problem in bivalve mollusca culture in China. Many research projects are being carried out focusing on the loss of good characters and the disease problems.

3. Genetic breeding studies of bivalve molluscs

Genetic breeding studies of bivalve mollusca have been developing in China [Xian, Chen, 1991]. Many species chromosome numbers were examined. The crossbreeding between Chlamys farreri Argopecten irradians , Patinopecten yessoensis was studied; Like most higher animals and plants, commercially important Mollusca are diploid, each cell of organism contains a matching set of chromosomes. The induction of triploids, tetraploids or diploid gynogens depends upon doubling chromosome during either meiosis I, meiosis II molluscs or fist cleavage, using physical or chemical shock treatment. There are three induction methods: Chemical shock, use of cytochalasin B (CB), thermal shock and pressure shock. Triploids and tetraploids of *Crassostrea gigas, Agropecten irradians, Patinopecten yessoensis, Chlamys farreri* etc. have been induced in China.

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