THE CHINESE EXPERIENCE

Pearl oyster culture in China began 45 years ago. In 1958, five pearl farms (*Pinctada fucata*) harvested round pearls through insertion of a mantle piece into the body of wild oysters (Jin, 1996). The following year, after successful breeding of *P. fucata*, many pearl farms were established (Chen, 1995; Jin, 1996; Li, 1999). In 1978, the first group of nucleus pearls from cultured *P. maxima* were harvested and the yield increased year by year as techniques improved (Xie *et al.*, 1985; Xie, 1995).

The provinces of Guangdong, Guangxi and Hainan are the main location of the farms producing marine pearls in China, with *P. fucata* and *P. maxima* as the main cultured species. Culture techniques involve floating rafts with suspended cages (Xie *et al,.* 1985; Xie, 1995). At present, the yield is more than 34 000 kgs compared to a low of 15 kg in early years (see Table 3.6.1).

In recent years, *P. fucata* became smaller than before, due to inbreeding since 1966 (Jin, 1996). This is one of the main problems limiting cultured pearl development and many researches have worked on options to restore the quantity of pearl oyster, especially polyploid reared oysters (He and Jiang, 2002; Chang and Wang, 2002).

The second problem which limited cultured pearl development was disease. The most serious disease is the "black shell disease" which can be found everywhere (Jin, 1996; Xie, 1995). It is a destructive disease caused by *Polydora* sp. Saturated salt-water soaking was often used to cure this disease (Xie, 1995). Aside from *Polydora* infections, other agents such as the sea mussels *Lithophaga malaccana* and *Botula silicula*, the clam, *Gastrochaena cunieformis* and piddock, *Zirfaea minor*, may also cause shell-perforation (Xie *et al.*, 1985). Parasites such as cestodes, trematodes and nematodes were also commonly found on the gills, mantle, foot, gonad and digestive gland of the pearl oysters (Xie, 1995). Some predators, such as Anguilliformes, Sparidae, Tetrodonidae, Scylla, Octopodidae, Asteroidae and Cymatiidae finfish were also harmful to pearl oysters. Rickettsia-like organisms (RLOs) are the main microbial pathogens reported and which have been associated with heavy mortalities to both *P. fucata* and *P. maxima* (Wu and Pan, 1997; Wu and Pan 1999a, b, c).

TABLE 3.6.1
Marine pearl production in China[1] (in kg)

Location	1990	1991	1992	1993
Guangdong	2 934	3 709	6 170	8 155
Guangxi	1 497	1 558	2 857	4 375
Hainan	60	68	300	15
Total	**4 500**	**5 336**	**9 327**	**12 545**
Location	**1994**	**1995**	**1996**	**1997**
Guangdong	12 737	16 382	14 055	12 393
Guangxi	5 963	10 831	11 277	11 393
Hainan	15	19	21	280
Total	**18 715**	**27 232**	**25 353**	**24 278**
Location	**1998**	**1999**	**2000**	**2001**
Guangdong	19 594	23 734	26 091	21 883
Guangxi	8 654	8 836	11 249	7 125
Hainan	250	510	1 280	1 215
Total	**31 498**	**33 080**	**38 620**	**30 223**
Location	**2002**	**2003**	**2004**	**2005**
Guangdong	23 042	20 133	20 890	22 845
Guangxi	11 065	9 191	8 500	11 025
Hainan	200	350	280	
Total	**34 307**	**29 674**	**29 670**	**33 870**
Location	**2006**			
Guangdong	24 634			
Guangxi	9 500			
Hainan	353			
Total	**34 487**			

[1] Internal material, Fishery Department of Ministry of Agriculture, China

THE PERSIAN GULF EXPERIENCE

In the Persian Gulf, three species of pearl oyster (*Pinctada margaritifera*, *P. fucata* and *P. radiata*) are reported to be severely affected by fouling organisms (Doroudi, 1993a, 1994, 1996). Most destruction of the shell is caused by clionid sponges (*Cliona vastifica*, *C. margaritifera* and *C. carpenteri*) and shell-boring mussels (*Lithophaga hanlyana* and *L. malaccana*). Cultured pearl oysters are more severely affected than wild oysters and mortalities were attributed to the shell destruction (Doroudi, 1994). Levels of mortality, however, were not reported. Other fouling organisms found included barnacles, oyster spat and tube-dwelling polychaete worms, however, these were not linked to poor pearl oyster performance and mortality. On natural beds, the principal fouling organisms found were sponges, encrusting algae and ascidians (Doroudi, 1996). An experimental evaluation of cleaning frequency and effect of fouling on growth of *P. radiata* revealed no significant difference between approximately three, six and 13 weekly intervals in cleaning between January and April 1993 (Doroudi, 1993b). The reason for this may have been the short experimental period.

Similar problems have also been reported with the clionid sponges *C. margaritifera* and *C. lobata* and other fouling organisms in raft-culture of pearl oysters along the southwest coast of India (Alagarswami and Chellam, 1976; Thomas, Ramadoss and Vincent, 1993).

THE RED SEA EXPERIENCE

Mortalities of black-lip pearl oysters (*P. margaritifera*) in the Dongonab Bay of the Sudanese Red Sea were tentatively linked to a spherical parasite (Nasr, 1982) similar to one described from *P. maxima* in Australia (Wolf and Sprague, 1978). These spheres have since been identified as sequestered autophagous inclusions (Perkins, 1996), so it is unlikely that they were the cause of the Dongonab Bay mortalities – more likely an effect. No mortalities have been reported from this area since the original description (Nasr, 1982).

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