1.2 Overview of the cultured marine pearl industry

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Southgate, P.C. 2007. Overview of the cultured marine pearl industry, pp. 7–17. In: M.G. Bondad-Reantaso, S.E. McGladdery, and F.C.J. Berthe. Pearl oyster health management: a manual. *FAO Fisheries Technical Paper*. No. 503. Rome, FAO. 120p.

INTRODUCTION

In the early twentieth century, the ability of pearl oysters to secrete mother-of-pearl (MOP) was harnessed for production of cultured pearls. Today this technique supports a global multi-million dollar industry, which utilizes a number of pearl oyster species in more than 30 countries. While the products of this industry adorn the jewelry shop windows of our major cities, it is also an industry that offers economic opportunities to coastal communities in less developed countries; an industry which involves individuals, cooperatives and families, as well as large multinational companies.

Global marine cultured pearl production and the major producing countries are shown in Table 1.2.1. The major species used to culture marine pearls are the silver-lip or gold-lip pearl oyster (*Pinctada maxima*), the black-lip pearl oyster (*P. margaritifera*) and the Akoya pearl oyster (*P. fucata*[1]). Species from the genus *Pteria*, commonly known as winged pearl oysters, also make notable contributions to global cultured marine pearl production. Table 1.2.1 shows the total cultured pearl production in 2004 had a farm gate value of around US$625 million of which freshwater pearls contributed

TABLE 1.2.1
Major cultured pearl producing species and the value of world cultured pearl production at the pearl farm level in 2004 according to Golay's estimates

Species	Pearl type	Major producers	Value US$ millions	Percentage of supply
Pinctada maxima	White South Sea pearls	Indonesia Australia Philippines Myanmar	220	35
Pinctada fucata	Akoya pearls	Japan China	135	22
Pinctada margaritifera	Black South Sea pearls or Tahitian Pearls	French Polynesia Cook Islands	120	19
Freshwater mussels	Freshwater pearls	China Japan	150	24
Total			**625**	**100**

Source: Anon. (2006)

[1] It should be noted that there is confusion regarding the taxonomic status of the Akoya pearl oyster which is probably best considered a complex including *P. fucata, P. martensii, P. radiata* and *P. imbricata.*

around 24 percent. Global marine pearl production in 2004 had an estimated value of approximately US$475 million of which white South Sea pearls from *P. maxima* contributed more than 46 percent.

Silver-lip/gold-lip pearl oyster, *Pinctada maxima*

Pinctada maxima is the largest pearl oyster species (Shirai, 1994) and is consequently used to produce the largest cultured pearls (approximately 10-20 mm in diameter). It is distributed within the central Indo-Pacific region, bounded by the Bay of Bengal to the west, Solomon Islands to the east, the Philippines to the north, and northern Australia to the south.

The terms "South Sea cultured pearl" and "South Sea pearl" are used for pearls produced in marine waters south of Japan. These names are associated with large cultured pearls produced from both *P. maxim*a and *P. margaritifera* (Strack, 2006). The international market recognizes and distinguishes between "white" and "black" South Sea cultured pearls, produced by *P. maxima* and *P. margaritifera*, respectively.

The major producers of cultured pearls from *P. maxima* are Indonesia, Australia and the Philippines with approximately 40 percent, 32 percent and 20 percent of total production, respectively (Table 1.2.2). Total production of pearls from *P. maxima* in 2005 was more than 9.3 tonnes with a total value of US$248 million. Pearl production from *P. maxima* increased by approximately 260 percent between 1999 and 2005 (Henricus-Prematilleke, 2005) to become the leading pearl category.

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South Sea pearls produced from *Pinctada maxima* range from white/silver through to gold in colour. They are the largest of the cultured pearls.

Australia

Pearl production began in Australia in the 1950s. Total pearl exports generally varied between 200 000 and 600 000 pearls per year from 1965 to 1995. There was a decline from 500 000 to 50 000 pearls per year in the mid-late 1980s resulting from high oyster mortalities (Pass, Dybdahl and Mannion, 1987). Exports increased from 200 000 to 2 million pearls per year between 1995 and 2006, however, the unit value of exported Australian pearls reached a 20 year low during 2004-2006. This decline probably reflected increased production, as well as external factors such as the Asian economic crisis of the late 1990s.

Australia enjoys an excellent reputation for the quality of its pearls.

TABLE 1.2.2
Production of cultured white South Sea pearls from Pinctada maxima in 2005

Country	Volume (kg)	Value (US$ millions)
Indonesia	3 750	85
Australia	3 000	123
Philippines	1 875	25
Myanmar	563	13
Malaysia	75	2
Papua New Guinea	75	unknown
Total	9 338	248 million

Source: Henricus-Prematilleke (2005)

Pearl farm workers clean nets containing cultured *Pinctada maxima* from a floating pontoon at a farm in West Irian, Indonesia. The nets are suspended from a long-line which is held on the surface using floats.

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This is demonstrated by the data in Table 2 showing that Australian pearls made up approximately 32 percent of total white South Sea pearl production in 2005 but accounted for almost 50 percent of the total value. However, Australia faces increasing competition from other producers who, one would assume, will be seeking to improve pearl quality. The Australian pearl industry is based primarily on adult oysters that are collected from the wild and used directly for pearl production (Wells and Jernakoff, 2006). The proportion of hatchery produced oysters used by the industry is therefore small (approximately 20 percent). Given that hatchery production provides the basis for selective breeding programmes, this strategy may, in the long term, favour other producers of white South Sea pearls, such as Indonesia, that rely on hatchery production.

Indonesia, Philippines and other countries

The Indonesian cultured pearl industry began in the 1970s when new laws enabled foreign companies to invest in Indonesia. The 1990s brought much-needed modernization of pearl farms resulting primarily from investment by foreign companies, which entered partnerships in Indonesia. The Indonesian Pearl Culturer's Association (ASBUMI) was founded in 1995 to develop marketing strategies. By 1999, Indonesia supplied more than a third of the world's South Sea cultured pearls and by 2005 production had risen to more than 3.7 tonnes (Table 2). There are currently around 107 pearl farms in Indonesia. All commercial pearl production is hatchery-based and the industry is supplied by at least 36 hatcheries.

Production of South Sea pearls from around 30 farms in the Philippines has risen from approximately 0.5 tonnes to 2 tonnes a year since 1999. Many of the farms have Japanese partners and much of the crop is exported to Japan. The pearl farms are centered to the north of Palawan Island and the adjoining Calamian group, in Samar and Cebu Island around the southern tip of Palawan and in Mindanao Island. Only wild collected *P. maxima* were used for pearl production until about 1990; however, hatchery-produced oysters have played an increasingly important role since the end of the 1990s.

Other countries producing significant quantities of cultured South Sea pearls from *P. maxima* include Myanmar, Malaysia and Papua New Guinea (Table 2). Small-scale pearl production from *P. maxima* also occurs in Thailand (Bussarawit, 1995), northern Viet Nam and south-western China.

Black-lip pearl oyster, *Pinctada margaritifera*

Pinctada margaritifera has a wide geographical distribution from the Red Sea and east Africa to eastern Polynesia. Despite its vast range, this species is used for commercial cultured pearl production almost exclusively within the atoll lagoons of Polynesia, in French Polynesia and the Cook Islands. It is the second largest pearl oyster species and generally produces cultured pearls in the 9–20 mm size range.

Kokichi Mikimoto established a pearl farm at Ishigaki, Okinawa in 1914 and a second farm in Palau in 1923 from where he succeeded in producing round pearls from *P. margaritifera* (Hisada and Fukuhara, 1999). In 1951, there were nine companies