

An Historical Perspective

DEVELOPMENT OF PEARL OYSTER HATCHERIES IN AUSTRALIA

By Robert A. Rose

Although some of the earliest experiments on the artificial propagation of the goldlip or silverlip pearl oyster (*Pinctada maxima* Jameson) were originally conducted in Australia, today this technology is still comparatively new to the country's pearling industry.

Unlike that of Southeast Asia, hatchery technology in Australia has not been widely accepted as a method of obtaining a constant supply of high quality oysters, or as a strategy for sustainable, cost-effective expansion of production. The reason for this is simply that there has been no necessity: major Australian producers have always been able to collect sufficient numbers of pearl oysters from their annual, government-issued, wild stock quotas.

Only since the late 1980s-to-early 1990s have the Western Australian and Northern Territory Fisheries Departments begun to allocate an annual quota for hatchery-produced oysters to licensed farmers. With domestication of the South Sea Pearl oyster now officially sanctioned by the relevant governmental authorities in Western Australia and the Northern Territory, several companies will be seeding hatchery-produced pearl oysters for the first time this year. This is at least 12 years after Indonesian pearl farmers began using artificial propagation methods. And, ironically, much of the technology used today by hatcheries in Southeast Asia was developed by Japanese scientists working in Australia during the 1960s and 1970s.

Research on the biology, larval and pearl culture of *P. maxima* in Australia began during the mid-to-late 1950s at the Commonwealth Scientific and Industrial Research Organization's Thursday Island Field Station, located in Queensland. However, none of CSIRO's research relating to larval culture was successful, or published. The only non-Japanese research published during the 1960s and 1970s was that of J. Minaur from the Cape York Pearling Company at Thursday Island. Unfortunately, this research failed to successfully rear the post-larvae beyond settlement, and was discontinued.

Meanwhile, Japanese scientists were also developing the technology to propagate *P. maxima*. Beginning in the early 1960s- and by the late 1970s-to-mid 1980s- they had succeeded in settling *P. maxima* on a large scale at several private hatcheries located in Australia, Japan and Southeast Asia (e.g., Torres Strait, Queensland; Kuri Bay, Western Australia, Amami Oshima, Japan; Sabah, Malaysia; and Sumatra, Indonesia). Except for a Japanese publication during 1981 by Y. Tanaka and M. Kumeta on their work in the Torres Strait, these achievements have remained (to a large extent) confidential.

During the mid 1970s, the Western Australian Fisheries Department became concerned over high levels of mortality associated with wild stock being collected and transported to farm sites. It was considered that exclusive reliance upon wild populations placed the Western Australian pearling industry at a considerable economic risk. Not only was the wild stock subject to natural fluctuations in levels of recruitment, but also to sporadic outbreaks of disease (like those which are now being experienced in Indonesia). In 1982, the Department began a research project into the feasibility of artificially propagating *P. maxima* as an alternative source to wild stock. From 1987 to 1988, larvae and spat were successfully reared and distributed to local pearl farmers for grow-out. As a result of this research, a hatchery manual was published, but access to the information was restricted.

In 1987-1988, a private proposal to set up a hatchery/pearl farm cooperative between members of the Western Australian Pearling Association was rejected. However, by 1990, two private hatcheries in Western Australia had been established... and by 1991, four or five commercial hatcheries were operating in Australia and staffed by either Japanese or Australian technicians. Two of these were located in Western Australia, one in the Northern Territory, and one or two in Queensland.

Hatchery technology in Australia is now widely viewed as a natural, historical progression from a captive

fishery to an aquaculture industry. The role of hatcheries will be to improve both the quality and quantity of saleable pearls within a harvest. Besides being able to produce a reliable supply of oysters (as stated above), artificial propagation will allow for the selection of genetically similar individuals to be produced almost all year-round. By having more control over their growth periods, farmers should be able to target on varying market niches by altering the timing for seeding and the size of the nuclei used. This, in turn, would improve the uniformity and quality of the harvested pearls... in particular their weight, colour, lustre, shape and surface complexion.

To sum up: hatchery technology in Australia is still in its infancy, but will become sustainable when grow-out programs are consistently able to produce at least one oyster in four that is suitable for pearl cultivation. This may, however, take a number of years to achieve.

As for the eventual impact of this technology: hatchery-produced oysters may very well increase the annual supply of Australia's cultivated South Sea Pearls in the future. This does not necessarily mean that increasing the quantity of cultured SSPs available to worldwide buyers will adversely affect market conditions. Success may be patterned after that of the edible oyster and prawn industries. That is: although the price may decrease, the market could very well expand... as more consumers could afford to purchase the product.

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