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A Review on Pearl Farming: the Rising Trend in India

Tanisha ¹, Asma Fayaz ² ✉

¹ Chandigarh University, Punjab, India

² Faculty of Agriculture, Chandigarh University, Punjab, India

✉ Corresponding email: asma.e9423@cumail.in

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Abstract Pearl farming, the ideal blend of production of gems and water. It is being considered as a practice that has sustainability and innovation that is not only economically but ecologically helpful too. China is the most prominent producer by fresh water pearl cultures in large scale. Behind Japan, there are Akoya pearls- high quality pearls and the exotic black pearls of French Polynesia. These two countries have jointly established a multibillion-dollar pearl industry in the world. Pearl farming continues to be in its nascent stage in India with the initiatives that were taken by the CMFRI (Central Marine Fisheries Research Institute) in starting of 1970. Despite demonstrations that have shown that it is practical through successful experiences with *Pinctada fucata* and freshwater mussels such as *Lamellidens marginalis*, the uptake is low. Nevertheless, the prospects are in satisfying the increasing demand of the global and domestic market of ornamental pearl, diversification of aquaculture and the creation of jobs in the rural areas. The pearl farming business in India is facing major challenges such as the technical expertise in surgical nucleation, inadequate infrastructure and high start-up capital despite the potential of the industry being enormous. India can transform this sector by concentrating on research, skill building and by coming up with favourable government policies. This would not only tie in sustainable aquaculture with economic growth but also make the country one of the key international markets in terms of pearl.

Keywords Pearls; Aquaculture; *Lamellidens* spp.; Oysters; Sustainable marine farming

1 Introduction

A Pearl is naturally produced gem, or gemstone that is produced within the soft tissues of some mollusc species such as oysters in the sea waters and mussels in the freshwater environments. This gem is highly lustrous, or has an assortment of colours, and is often a perfect round. It consists of 85% calcium carbonate, 12 percent organic matrix and water. The primary constituent is calcium carbonate that may have the form of aragonite or calcite. It surrounds all foreign particles or irritants that might have entered and lodged within the interior of the shell of the mollusc. The pearl has hardness value between 3.5 and 4.5 and specific gravity 2.7. Any mollusc may produce any form of pearl; but the finest pearls are those produced by those which have nacre on the outer shell. Pearls are grouped into three categories of natural pearls, cultured pearls and artificial pearls (Alagaraswami, 1974).

Pearl farming/pearl culture is a subdivision of aquaculture which denotes the cultivation of pearls in a controlled or semi-controlled environment through the rearing of pearl oysters or freshwater mussels. To make a pearl, a nucleus and mantle tissue transplantation is surgically inserted into the mollusc that then secretes shells of nacre (calcium carbonate and organic matrix) around the implant. There are several processes involved in pearl farming which requires 12~24 months to produce the first pearls.

2 Global History of Pearl Farming

The earliest, free and round man-made/cultured pearl of India was produced at Pearl Culture Laboratory, a division of the Central Marine Fisheries Research Institute, at Veppalodai, near Tuticorin in July 1973. It was prepared by using Indian pearl oyster *Pinctada fucata*. Cultural technology has now produced pearls of different sizes and colour. Pearls began to be cultivated first in Japan in 1893 when half-pearls on shells were produced, and then in 1907 with the successful breeding of spherical ones. It has since been dominated in the production, marketing and technology of cultured pearls, in the world. In 1956, Australia began to farm pearls with Japan, and