Precautions: 1) Wash the instruments properly, before and after use. 2) Avoid the use of mature oysters for nucleus implantation. 3) Avoid harming the stomach, heart, or intestine. 4) Make the incision or cut according to nucleus size.

7.5 Post-operative care and culture

Oysters are maintained in a flow-through system after operation until they are narcotized, or frequent water changes are done where flow-through system is not accessible. They spend three to four days in the lab in order to reduce stress by being observed in filtered clean water. Once they have been stabilized, they are taken to the farm and kept in fitting cages. Oysters are kept to low densities, suspended at lower levels and are treated sparingly to avoid stress during the post-operative stage. The period of culture on the nuclei with size in the range 2-5 mm takes 3-12 months in Indian conditions. The last harvest period is based on the harvests that are experimental and monthly observed (Victor et al., 1995).

7.6 Pearl formation

7.6.1 Natural pearl formation

Pearl formation in pearl oysters begins with organic or inorganic nucleus (e.g. sand grains, parasites, molluscan eggs, plant debris, epithelium cells of same animal etc.). These particles invade the oyster during feeding or breathing and sink in between shell and mantle. As an answer, mantle epithelium invaginate the foreign body and create a pearl-sac surrounding it.

Pearls only form after a pearl-sac has been formed, which is formed out of the interior or exterior epithelium of the mantle or gill plate. The secreted nacre of the epithelial cells of the pearl-sac increasingly coats the foreign object to form a pearl. There are seldom natural pearls between the mantle and shell, in the mantle, or in other soft tissues; these pearls tend to be small and irregular-shaped. Large pearls of round shape are very rare. When the irritant is stuck on the shell, forming a blister pearl is possible that only reflects the irritant on the exposed surface (Victor et al., 1995).

7.6.2 Cultured pearl formation

Their creation is anthropogenic. In any form of pearl development two things are indispensable, the outer epithelium of mantle lobe and a nucleus. The human made nucleus is gently inserted into the oyster tissue through appropriate surgery procedure. Grafted oysters are returned to the water in order to keep growing. As the inner epithelium and connective tissue of the mantle is absorbed, the outer cells of the graft tissues divide and form a pearl-sac around the nucleus. The pearl-sac cells produce a nacre (mother-of-pearl) in concentric micro-layers over the nucleus and get nourished by the adjacent tissues. Nacre is made up of aragonite (0.29 0.60 mm thick) and conchiolin, an organic mucopolysaccharide binding layer that is alternately and interchangeably composed of these components. Farmed pearls recreate the same process as nacre deposition and creation of pearls. A covering a few of the nuclei upon the inner of the shell gives half-pearls, the mantle epithelium forming a pearl-sac upon the top of the bare nucleus (Victor et al., 1995).

7.7 Harvest of pearls

The pearl culture period is short in tropical India in comparison with temperate locations. It may take up to 12 months in pond culture, each pond varying in the duration of time according to the size and number of nuclei, the well-being of the mussels and the conditions of the pond. The pearls that are formed as a result of gonadal implantation or grafting of mantle tissue are affected by the mother mussel and the donor mantle graft, and have a colour of silvery white to golden yellow and deep pink. The harvesting involves either killing of the mussel or extracting of the pearls in live mussels at the end of the culture period (12~14 months). Even though the freshwater mussels can produce pearls of gem quality, the size, shape, and colour may change because of natural variation. Pearls that are harvested are often washed, whitened, or dyed to ensure uniformity and value addition (Victor et al., 1995).