

by mud or sand. Habitats are in form of immobile stationary ponds, tanks, lakes, rivers, and reservations. Harvested pearl mussels on the natural bed are not always reliable because of their irregular harvest and contaminated water. The mussels seed grown in the hatcheries are much superior regarding the right supply of the pearls mussels to keep up the yearlong production. The mussels are grafted after growing such seed, according to weight, age, the degree to which they have sexual maturation and health in general (Ali and Rawat, 2023).

### 7.2 Pre-operative conditioning

The native pearl mussel species which were collected as freshwater are then subjected to the two-day pre-operative conditioning. They are kept in 200-liter ferro-cement tanks where the stocking density of the mussel is one mussel per litre. The pre-operative conditioning takes proper care of the relaxation of adductor muscles before surgery. This is important considering the low application of narcotizing methods that are used in the marine pearl production activities (Misra et al., 2009).

### 7.3 Selection and conditioning for surgery

Oysters that are 20 grams and above, are used to perform operational surgery with a goal of producing good outcome. They should be healthy and non-infected from borers. Oysters with maturing or mature gonads would be inappropriate because the gametes leak out during surgery and obscure the implantation site. Gametes may flow rapidly along the channel and the resultant graft tissue and nucleus may remain in place. Consequently, the selection of the oysters ought to be made of just oysters that are either at the initial stages of gametogenesis or recovering after spawning. The soft areas should be free of shells of sponge borers, polychaete blisters and trematode infections. The oysters should be stripped off all foul organisms.

The oysters are chemically conditioned to operate. Menthol crystals are added into the seawater in troughs of the oysters that are carefully selected. The oysters narcotize within 45~60 minutes and at this stage the valves are open because of adductor muscle's loosening. Once each oyster is stripped, a wooden peg is placed between the valves and rinsed in sea water. The use of such narcotized oysters in the procedure should be as immediate as possible. When the oysters are put in pure seawater after surgery they will heal in 30~45 minutes (Victor et al., 1995).

### 7.4 Surgical implantation

Surgical implantations can take place in three sections of the mussel, which are of three different kinds depending on the kind of pearl being aimed at. A particular type of implantation is undertaken with each mussel. The mantle cavity insertion method is simple. The mussels of the weight and shell length required are collected prior to operation. They are appropriately opened with a 0.5 cm broad speculum that does not damage the soft tissues and adductor muscle of the mussels. An aperture the size and shape of a planned pearl, say 1 cm is cautiously inserted into the mantle cavity after a small section of the anterior side of the mantle has been detached, with care, at the top shell valve. Then it is driven in deep to avoid being rejected. One mussel may be implanted with the foreign organism that is desired in both of its valves.

Before surgery in the mantle tissue procedure, the mussels that are to be operated upon (the recipient mussels) and those sacrificed (the donor mussels) are separated into two categories. The pallial mantle ribbon of the living donor mussels is excised, clipped to grafts of the appropriate size and c alone or together with a small nucleus (2 mm in diameter). This kind of grafting is performed on both of the mantle lobes. There can be two to eight implantations depending on the size and thickness of the mantle of the recipient mussel.

In preparing the live graft parts to be implanted through the gonadal procedure, the recipient mussels are opened carefully to a depth of about 0.5 cm with a shell opener. Another end of the graft needle has a specialized knife that makes a tiny, precisely calibrated slit when he is making the incision beneath the outer membrane of the gonad. Caution should be observed that one does not make deep cuts into the gonadal tissue in order to avoid injuries to the intestinal coils. Only one implantation per oyster is to be done (Misra et al., 2009).