Biosecurity and health management in shrimp hatchery

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- **Good management practices (for prevention and control of disease and thus optimising productivity)**
- **A. Brood stock**
- 1. Care should be taken about vertical transmission of the disease through ovarian tissue.
- 2. Collection of spawners from wild with minimum stress by arranging shorter duration trawling. Transportation should be done in proper condition with oxygen and stocking density to minimise stress.
- 3. Prophylactic treatment with formalin at 50 ppm for 1 hour under strong aeration. Proper acclimatisation should be performed.
- 4. Test of brooders for WSSV using terminal portion of pleopod and for MBV using faecal matter using PCR techniques.

- **B. Induced maturation by eye stalk ablation**
- 1. Hard-shelled, inert-moult female shrimps free from disease or injury having spermatophore in the thelycum should be selected for eyestalk ablation.
- 2. Female should be above 100 gm in weight for ensuring good quality eggs (for *P monodon*).
- 3. Eyestalk ablation should be avoided for newly moulted and ready to moult female shrimps.
- 4. Electrocauterization is the best way of ablation as it causes minimum stress.
- 5. Proper stocking density, feeding with both natural and artificial feed, optimum water quality and low light intensity for captive maturation.

- quality and low light intensity for captive maturation.
- **C. Spawning and hatching**
- 1. Disinfection of spawners with formalin before placing in the spawning tank.
- 2. Feed should not be provided in spawning tank.
- 3. Spawned eggs should be collected, washed throughly and disinfected by formalin-dip treatment and resuspended in fresh sea-water for hatching. (dip treatment of eggs with 100 ppm formalin for 30 sec and 50 ppm povidone-iodine for one minute.
- 4. Active and positively phototactic nauplii should be collected for transfer to larval rearing tank.

- 5. Washing of naupli first with 200 ppm formalin for 30 sec and 50 ppm povidone-iodine for 1 min.
- 6. Tests for vibriosis, fungal parasites and viruses.

- **D. Larval rearing**
- 1. Nauplii from a single spawner should be reared separately to avoid cross contamination.
- 2. Proper water quality, stocking density and feeding as per the standard protocol should be followed.
- 3. Avoid use of antibiotics and prohibited drugs better to use probiotics.
- 4. At PL5, larvae should be collected, disinfected with formalin dip treatment and distributed outdoor nursery tanks.
- 5. Only PL20 should be sold to the farmers after testing for viruses. **(also see the tables given below for larval quality. They are important)**

- **E. Algal culture and artemia hatching**
- 1. Treatment of water with UV for making pure culture to avoid cross contamination.
- 2. Quality evaluation of mass culture.
- 3. Artemia cysts should be disinfected before keeping them for hatching.
- 4. Segregation of hatched and unhatched artemia and removal of cyst wall before use.

Biosecurity in shrimp hatchery

- Biosecurity involves maintaining disease-free environment in all production phases. It is a preventive measure against disease outbreak so performed as prior practice. Biosecurity has been defined as "...*sets of practices that will reduce the probability of a pathogen introduction and its subsequent spread from one place to another*..."

- **Some important preventive measures are as follows.**
- 1. Shrimp hatcheries should be designed properly so that biosecurity can be implemented. Shrimp hatcheries should consist of several units, each having appropriate infrastructure.
- 2. Good hatchery design should include the physical separation or isolation of the different production facilities and effective perimeter security.
- 3. To minimize the possibility of infecting existing broodstock via the introduction of new animals, there should be a quarantine unit for new broodstock.

- 4. Water treatment systems should be designed to provide high quality oceanic seawater The design of the water distribution system should take into account the level of biosecurity required by the individual areas to which the water is distributed.
- 5. All water discharged from the facility should be free of pathogens (should be treated with 50 ppm active chlorine for not less than 60 min.)
- 6. Use of specific pathogen free (SPF) or high healthy brooders should be used.
- 7. All incoming stock should be quarantined properly. Disease screening should be done.

- 8. Equipment and materials should be sterilised and maintained clean. Transfer of materials from one unit to another should be avoided.
- 9. Personal hygiene measures including washing of hands and feets and clothing needs to be taken care.
- 10. Knowledge of potential risks and their control measures to be implemented.
- 11. Optimum water quality and feeding is required. Stress should be minimised.
- 12. Immune enhancers and probiotics should be used in place of antibiotics.
- 13. Tests of PL before sell for various bacterial and vieal diseases.