Filamentous algae in aquaculture ponds: Prevention and control measures

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Occurrence of filamentous algae in aquaculture ponds is noticed at many places in India. These algae are harmful if allowed to grow beyond a certain extent in these ponds as they limit the free movement of animals under culture in the system. Further, they lead to instability of dissolved oxygen, sometimes to the extent of its depletion at the pond bottom, resulting in mass mortality, if not immediately restored to normal level and stability.

Several factors individually or jointly influence the growth of a particular species of aquatic weed in a culture system. Besides geographical and climatic conditions, topography, depth of the water, access to sources of algal infestation, and occurrence of floods are some of these factors that are of importance. Aquaculture ponds which cannot be drained and dried regularly and with thick deposits of silt at bottom are more likely to have recurring algal problems. Persistent blooms of certain algae have been variously attributed to their ability to store nutrients or to produce and liberate certain metabolites that help in the exclusion of other algae.

In shallow ponds without adequate level of phytoplankton bloom to shield the bottom from sunlight, massive development of filamentous algae (*Chaetomorpha* sp and *Enteromorpha* sp), often takes place. These green weeds take up space in the system, consume oxygen at night and decompose after death creating an anaerobic bottom environment. They will also grow on the body of the cultured animals, thus leading to disease incidence. Filamentous algae often compete with phytoplankton, alive or dead, for nutrients. This would affect the secondary production level too.

Fertilization of ponds with inorganic nutrients will help prevention of filamentous algal growth, to a certain extent. This will produce phytoplankton blooms, which will shade and kill the submerged forms of algae. Accumulation of silt can be reduced by preventing drainage run-off from land areas and by regular desilting of ponds. Providing mesh filters to prevent entry of weeds and their spores can be of some help. Other methods for removal of filamentous algae are: i) Manual method ii) Chemical control and iii) Biological control.

Manual method is practiced for smaller ponds (<1 ha) using hand scythes, wire mesh, coir nets etc.

For chemical control, Copper sulphate and Simazine (2-Chloro 4,6 bis (ethylamine) - triazine) are effective. Copper sulphate Pentahydrate (CSP) is very effective for removal of several filamentous algae when used @ 3 ppm. These chemicals may however effect long term productivity of food organisms by their persistence in the water or by their accumulation at the pond bottom. Their non-selective toxicity may also be a drawback in using them regularly. Judicious use of these chemicals is therefore necessary.

Biological control is an effective measure to restrain growth of filamentous algae. In polyculture practices, stocking of milkfish (*Chanos chanos*) @ 200 to 300/ha helps control of filamentous algae. In *Macrobrachium* spp. culture in Taiwan, filamentous algae is maintained upto a certain limit to act as a shelter and to minimize cannibalism. Use of herbivorous fishes has been found to be useful in controlling growth of filamentous algae and other soft submerged vegetation. Also introduction of Tilapia (*Sarotherodon mossambica*) @ 2000 to 2500 nos/ha is found to eliminate algae and rooted submerged vegetation. Rabbit fish (Siganids) which consume filamentous algae could also be released in smaller numbers to control algae. These fishes do not harm the cultured organisms.

Sterile hybrids or monosex species are advised to be introduced for biological control and at the same time for preventing their multiplication in aquaculture ponds so as to minimise competition for food the fishes under culture have to face when Tilapia multiplies.

Genetic Manipulation of Penaeid Shrimps

According to a report in *FFI* Aug'99 issue, Australian researchers have found that manipulating genes responsible for penaeid shrimp's sex determination is a complex job. But they found that the differences in the genomic sequences of the DNA of the various species are slight. By using the molecular method of substractive hybridisation, they could locate 3 markers for males and one for females, in the case of *P.japonicus*. It is felt that finding fewer markers than expected should make eventual genetic manipulation less complex. The advantage of manipulating sex is that females grow faster and convert feed more efficiently, leading to the conclusion that culturing females would yield higher profits.