

Research note :

BIOLOGICAL CONTROL : AN ENVIRONMENT FRIENDLY APPROACH IN CONTROLLING DISEASES IN AQUACULTURE

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Aquaculture of finfish and shellfish is one of the fastest growing sector which contributes significantly in world trade. More than 377 species are cultured in 178 countries around the globe. Intensification of aquaculture practices to achieve high production from limited natural resources resulted into outbreak of many diseases. These diseases now recognized as significant constraint to aquaculture production, trade that affected overall economic development of sector in many leading fish producing countries. For instance, disease is now considered to be limiting factor in shrimp farming industry. So far, conventional approach such as chemotherapeutics and antimicrobial drug have had limited success in preventing and cure of aquatic disease. There are growing concerns about the use of antimicrobial drugs not only in human medicine and agriculture but also in aquaculture sector. Several alternative environmental friendly strategies to use of antimicrobial agent, fish pharmaceuticals in disease control have been proposed and have been applied very successfully in aquaculture. The biological control of disease in aquaculture by to use of various biological control agents is upcoming concept. The author has critically summarized potential biological control agent and their possible application in controlling diseases in aquaculture.

Biological control concept :

The health of fish in aquaculture as well as in nature is depends primarily upon their resistance to microbial invasion and the biological equilibrium between competing beneficial and detrimental microorganisms at the fish

and water environment interface. The method of biological control use the antagonism of certain microorganisms to repress other pathogenic microbes bacteria and viruses in aquatic environment. The antagonisms among microbes is naturally occurring phenomenon through which pathogen can be killed or reduced in numbers in culture environment. The method called biological control has already been recognized in the field of agriculture for example, the famous bacterium *Bacillus thuringiensis* which infect pathogenic insects of agricultural crops orally and eventually kills them. Thus *Bacillus thuringiensis* bacterial preparation is now commercially available in Europe and North America. The positive results have led to further studies using viruses, fungi and protozoa as biocontrol agent to eliminate pathogenic organisms from aquatic environment. The efficient biological control agent must be depend upon following characteristics

- 1) Able to regulate host at low numbers.
- 2) Should have a high reproductive rate.
- 3) Life cycle of the natural enemy must be well synchronized with that of the host.
- 4) Should be able to persist in the environment in the absence of its primary host.
- 5) Should be specific to the host.
- 6) Easy to culture and colonize.

This approach of biological control is described in detail herein

Bacterial Disease:

Several bacterial pathogens known to cause disease outbreak in aquaculture