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Effects of Fouling Organism in Aquaculture

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Abstract

Plants or animals that live adhering to the surface of the materials in the water are known as fouling organisms. Aquaculture fouling, also known as biofouling, is a major issue that results in damage, disease, and other challenges for the aquaculture farm. The impact of fouling organisms on shellfish culture is physical damage to the culture system, biological competition, and environmental modification, whereas in finfish culture, water conditions are affected and water exchange is restricted, increasing disease risk and causing deformation of cages and structures. Different forms of fouling organisms exist. Barnacles, hydroid, bivalves, polychaetes, and sponges are all frequent creatures. There are numerous controls in place to mitigate the effects of fouling organisms. Physical removal, biological control, the use of protected equipment, net change and frequent cleaning, and the use of antifoulant are all common steps.

Introduction

Plants and animals that dwell in water are known as fouling organisms. Within a few hours, bacteria, algae, protozoa, and fungi proliferate. These colonisers will create a biofilm on a hard surface, and the collection of these organisms is known as microfouling or slime. Barnacles, mussels, ascidians, and hydroids are among the macrofouling creatures that use these microfouling organisms as a foundation for their growth. The aquaculture infrastructure, such as submerged components with aerators, pipes, cages, nets, floats, and ropes, provides the surface for biofouling. The habitats of these animals are harmful to culture systems and have a negative impact on economic progress. Many preventive measures are performed to lessen or prevent the organism's impact on the aquaculture system. There are numerous antifoulants on the market, and new ones are being developed all the time. Chemical, biological, electrical, ultrasonic irradiation, surface microtexture, and hazardous compounds are among them. Due to the proliferation of the fouling organism, water exchange is restricted. The pond's entrance and outflow pipes become clogged, and there is no water flow. Pathogens or microorganisms that cause diseases by raising stress levels, lowering oxygen levels, and lowering immunity. Apart from illnesses and farm damage, cleaning organisms for the next step in the process is more difficult (Bannister *et al*., 2019).

Impact on Aquaculture

Biofouling is a serious concern in aquaculture or aquafarms, where it primarily damages infrastructures and has major key implications, such as limiting water exchange, disease risk, and so on. The influence of biofouling in farm machinery such as aerators results in high maintenance and repair costs. It also lowers the oxygen transport efficiency

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in the ponds. Cage netting is severely harmed due to the collection of fouling organisms, which causes the net to deteriorate and become heavier. As the number of fouling organisms in the environment grows, there is a biological rivalry between fish species, as well as a shortfall in food consumption, resulting in low fish or shrimp yields.

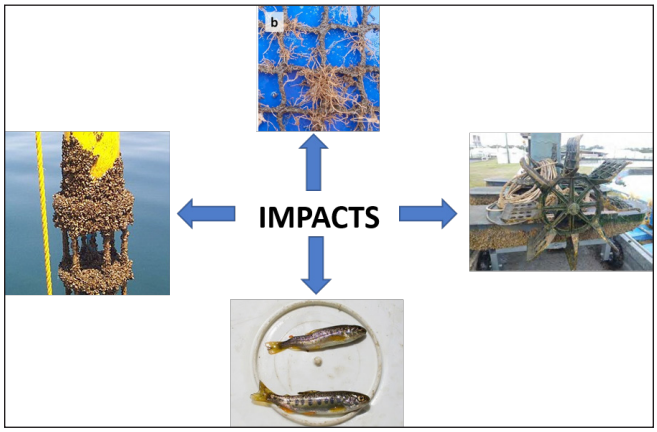

Figure 1: Impacts fouling organism in aquaculture

Control of Fouling Organism

Mechanical cleaning or the use of antifoulants are the two most popular strategies for controlling the organism. Chlorothalonil, dichlofluanid, diuron, irgaol1051, zinc pyrithione, and zineb are some of the most regularly used antifoulants in antifouling paints. The antifouling paints are where most of the equipment, such as rope, floats, nets, and trays, are housed. This technique is also hazardous to cultural species, as poisonous compounds are harmful to them. Mechanical cleaning entails manually removing, brushing, or scraping the undesired organism, followed by air or sun drying after or before the culture (Fitridge *et al*., 2012).

Conclusion

To summarize, fouling organisms are the species that cause the most problems in the aquaculture system, and prompt action should be done to eliminate them. The use of a variety of natural and artificial approaches lends a hand in agricultural protection. Because prevention is better than cure, farmers should take precautions to avoid fouliers from attacking the farm by using antifoulants, resulting in a healthy farm.

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