Microbial Interactions in Aquaculture – Introduction to the Symposium

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Aquaculture is the fastest growing agro-food industry in the world today. The increasing global demand for seafood can not be met fully by traditional wild fisheries. Aquaculture species must fill the gap. The Food and Agriculture Organization of the United Nations estimates that cultured species of finfish and shellfish will supply 50% of the wold's seafood requirements by 2020.

As with any agricultural operation, intensive aquaculture facilities carry certain risks. Stocking densities that are higher than naturally seen, manipulation of breeding cycles, husbandry practices and other operations all impose stressors on the animals and thus increase the risk of disease outbreaks due to infectious organisms. It is imperative that these risks are minimized and that potential pathogens are detected.

However, not all microbes within an aquaculture operation are pathogens. Indeed, the majority of microbial species are most likely benign or beneficial to the aquatic animals being cultured. As with most areas in microbial ecology, there is very little current knowledge of the microbial interactions within aquaculture operations. Much more information is needed on the nature of the microbial populations within a salmon farm, a freshwater hatchery, a shellfish nursery, or any other aquaculture site. It is clear that the microbial ecology of these environments will be dynamic and will change as the environment and the cultured animals change. Information is required on the dynamic nature of the microbial populations, the relative abundance of pathogens versus probionts. Also, information on epidemiology of diseases and transmission of disease organisms is required, as well as sensitive and specific methods to detect those organisms.

It was gratifying to be asked to organize the symposium on "Microbial Interactions in Aquaculture". With this session, researchers in aquaculture microbiology and other areas of microbial ecology will recognize common challenges, questions and solutions. At ISME-8 we were privileged to hear from five experts in this field. Four of these seminars are summarized here. Our invited speakers covered such disparate areas as bacterial populations associated with marine fish eggs; microbial pathogen-host interactions; the use of probiotic bacteria in shrimp aquaculture; the epidemiology of a viral pathogen of salmonids; and the art of detecting pathogens in an aquatic environment. All of these topics have the common theme of the need to understand the microbial ecology that is essential to the success of this fast-growing industry.

Microbial Biosystems: New Frontiers
Proceedings of the 8th International Symposium on Microbial Ecology
Bell CR, Brylinsky M, Johnson-Green P (ed)
Atlantic Canada Society for Microbial Ecology, Halifax, Canada, 1999.