

Prof. Dr. R. Dinakaran Michael

Research Interest

The main areas of our research interest include developing environment-friendly prophylactic and therapeutic immunostimulants from terrestrial and marine plants for culture fish. Another area is heavy metal-induced immunosuppression in fish and this aspect has relevance to extensive cultures in large water bodies which are more often receive polluted waters from rivers and canals which are polluted by industrial effluents. Stress-induced immunomodulation due to social stressors (e.g crowding, monosex cultures) is another priority area of research in this centre.

Plant-derived immunostimulants

Aquaculture faces substantial annual loss of production due to diseases. Antibiotics and chemotherapeutic agents are being used to control microbial diseases in aquaculture systems. These agents are not only expensive, they are also environmental pollutants. Further, they often result in the development of antibiotic resistant strains of microbes. In this context, terrestrial and marine plant-derived, immunostimulating compounds offer promising results due to its broad spectral activity and cost-effectiveness. India has been bestowed with enormous wealth of traditional terrestrial medicinal plants and marine plants. Hence the centre aims at studying the immunostimulatory and antibacterial properties of these plants' extracts in fish for developing the processes and the products for wider application of them as immunoprophylactics and therapeutics in aquaculture in this country

Heavy metal induced immunomodulation

Aquatic environment of fish is in close contact with numerous pollutants. Aquatic pollutants such as heavy metals modulate (most of them suppress) the immune system of fish, thus increasing the host susceptibility to infectious pathogens. So, one of the aims of the centre is to investigate the effect of heavy metals such as chromium, cadmium, mercury and other common pollutants on the immune status of fish. This assessment of the immune status of fish is not only helpful as the source of basic immunotoxicological information but also as immuno-indicators for monitoring fish health in extensive fish cultures in large lakes and ponds.

Stress-induced immunomodulation

Intensive aquaculture practices where culture fish is usually over crowded often result in stress-mediated immunosuppression in fish, leading to sudden outbreak of fish diseases. This laboratory aims at finding the mechanism behind stress-mediated immunosuppression in fish. Another related area of interest is the effect of complex social interactions among the culture fish communities (all male, all female or mixed population) on the immune system of fish. This approach can help fish farmers to devise species-friendly management practices thereby preventing heavy loss due to outbreak of diseases.