

Modelling, instrumentation and control in marine larviculture

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Abstract:

The larval phase in production of marine fish is a critical phase, partly due to the need for live feed organisms that need to be produced reliably in sufficient amounts with adequate nutritional value. To produce marine larvae with lower mortality and better stability and efficiency, there is a need for integrated automation systems that go beyond the basic mechanization of tasks. Both in live feed production and in the start feeding of fish, this means combining automated measurements with our knowledge of the biological processes, to compute control inputs that promote efficient production without compromising stability. In this context, stability can mean avoiding crashes of live feed cultures or problems caused by excessive bacterial growth.

Many components of such a system have already been developed, including equipment for automatic measurement of density and development of live feed organisms, mathematical models, and feedback control systems to automate rotifer production and feeding of fish in the rotifer phase. However, these have failed to gain significant traction both in research and in the industry. In this talk, some of the earlier efforts are highlighted, and possible reasons for this lack of success are discussed.