

Probiotics as biological control agent in sea bass larviculture

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To hamper the emergence of acquired resistance, the use of antimicrobial agents should be curbed in both human and (aquatic) veterinary medicine. However, simultaneously, disease outbreaks are increasingly being recognized as a significant constraint on aquaculture production and trade, affecting the economic development of the sector. The use of probiotics as a biological control agent in aquaculture is popular as an alternative for the use of antimicrobial agents in disease prevention and production enhancement. Nowadays, new and fascinating research questions arise regarding the mechanisms through which the probiotics may act. Understanding probiont action may permit to utilize the right strain to protect from, treat or prevent specific disorders.

The aim of this study is to isolate and select probiotics for use in sea bass (*Dicentrarchus labrax*) larviculture and to unravel their modes of beneficial activity. Two hundred and six isolates were primarily isolated from gut of larval and adult sea bass from varying origin and evaluated *in vitro* using various mechanisms of selection including antagonistic activity against eight sea bass pathogens, adhesion to sea bass gut mucus and a lack of hemolytic activity. Following, twenty isolates exhibiting positive *in vitro* results were withheld and are currently being assessed *in vivo* for a lack of harm towards the larval host. The isolates that are harmless will be identified using 16S rRNA gene partial sequencing and further evaluated in terms of their protective capacities during an experimental challenge and stress test. The isolates exerting a positive effect on larval survival and development, will consequently be used to unravel their mechanism of action in the near future, with a focus on disease resistance in the host organism. This will be realized by applying innovative techniques e.g. gnotobiotic larval model systems, immune priming and tissue/cell-specific gene analysis using laser capture microdissection.