

Gnotobiotic models for seabass (*Dicentrarchus labrax*) and Dover sole (*Solea solea*): the chain is only as strong as its weakest link...

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The larval phase of the mariculture production cycle still suffers from major losses due to pathogenic agents that are mainly bacterial in nature. Because of the emergence of acquired resistance, one should opt for alternative measures to combat disease. In this respect, the use of probiotics in aquaculture is popular but scientifically poorly documented. Indeed, there is a paucity of information on the mode of action of probiotics and their interaction with the larval aquatic organism. Only very few reports in this research domain adopted gnotobiotic host models. This is nevertheless crucial for drawing unequivocal conclusions taking advantage of the absence of interference by other microbial residents. For such a model, fully bacteria-free eggs are needed as a starting point. Preferably, the egg and larval medium should be devoid of antimicrobial agents not to restrict the probiotics to be screened in terms of sensitivity nor to influence egg and larval physiology.

This study describes the various steps that were taken in the pursuit of pinpointing such a model for seabass (*Dicentrarchus labrax*) building on previously carried out research. Additionally, the creation of this model for Dover sole (*Solea solea*) was initiated and is on-going. Various disinfectants with varying concentrations and contact times were tested for sea bass and are currently being evaluated for Dover sole aimed at obtaining fully sterile eggs with an acceptable hatching rate and no increase in larval malformations or mortality. Different larval housing and manipulation techniques were evaluated and culture dependent and independent techniques for checking their axenic status additionally are being examined. All eventually identified and tailor-made measures necessary for generating an axenic model, need to be carried out with great scrutiny. Indeed, it is truthful to state that for the creation of full axenity, the chain is only as strong as its weakest link.