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Skeletal anomalies in reared European fish larvae and juveniles. Part 2: main typologies, occurrences and causative factors

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Abstract

The presence of skeletal anomalies in farmed teleost fish is currently a major problem in aquaculture, entailing economical, biological and ethical issues. The common occurrence of skeletal abnormalities in farmed fish and the absence of effective solutions for avoiding their onset or definitely culling out the affected individuals as early as possible from the productive cycle, highlight the need to improve our knowledge on the basic processes regulating fish skeletogenesis and skeletal tissues differentiation, modelling and remodelling. Severe skeletal anomalies may actually occur throughout the entire life cycle of fish, but their development often begins with slight aberrations of the internal elements. Comprehensive investigation efforts conducted on reared larvae and juveniles could provide a great contribution in filling the gap in knowledge, as skeletogenesis and skeletal tissue differentiation occur during these early life stages. The aim of this review is to provide a synthetic but comprehensive picture of the actual knowledge on the ontogeny, typologies and occurrence of skeletal anomalies, and on the proposed causative factors for their onset in larvae and juveniles of European farmed fish. The state-of-art of knowledge of these issues is analysed critically intending to individualize the main gaps of knowledge that require to be filled, in order to optimize the morphological quality of farmed juveniles.

Keywords

Author Keywords: causative factor; environmental condition; genetics; juveniles; nutrition; rearing methodology; skeletal anomalies

KeyWords Plus: SALMON SALMO-SALAR; BASS DICENTRARCHUS-LABRAX; COD GADUS-MORHUA; HALIBUT HIPPOGLOSSUS-HIPPOGLOSSUS; SOLE SOLEA-SENEGALENSIS; GILTHEAD SEA BREAM; SEABREAM SPARUS-AURATA; FLOUNDER PARALICHTHYS-OLIVACEUS; POLYUNSATURATED FATTY-ACIDS; TROUT ONCORHYNCHUS-MYKISS

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