

GENOMICS OF LUMPFISH (CYCLOPTERUS LUMPUS): TOWARDS MARKER ASSISTED SELECTION

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Lumpfish *Cyclopterus lumpus* is a commercially important fish in several areas of its range in the North Atlantic Ocean. This species also plays a vital role in salmonid aquaculture where it serves as a biological agent of sea lice control. Recent investigations into the cleaning behaviour (sea lice grazing efficacy) and disease resistance in several families of lumpfish showed significant difference among families, of which, the genetic basis is yet to be investigated for selective breeding programmes. Despite the fishery and aquaculture importance of lumpfish, few genetic resources are currently available for the species. Here, a genomic approach with different next-generation sequencing platforms was used to gain insight into the patterns of genome-wide variation in a wild cohort (n=30) of lumpfish distributed along the Norwegian coastline. First, this study assembled a draft genome of lumpfish using two differently size-selected, from Illumina paired-end read libraries (MiSeq) and from a 400 bp single-end read library using the Ion Torrent sequencing platform. Second, single nucleotide polymorphisms (SNPs) and small structural variants (insert-deletions, INDELS; or complex variants) were isolated and characterized using a double digest restriction associate DNA sequencing (ddRAD) approach. Finally, the complete mitochondrial genome was assembled and annotated for lumpfish and its phylogenetic placement within the order Scorpaeniformes was determined. The extensive genomic information reported here will facilitate molecular ecology studies and many aspects of the selective breeding programme of lumpfish, especially for marker-assisted selection.

Biography

Albert K D Imsland finished his PhD degree in Aquaculture from University of Bergen, Norway in 1997 and has been an Adjunct Professor from this University since 2004. He is the Research Director in Aquaculture in the Tromsø based research company, Akvaplan-niva AS. Central in Imsland's research is the internal and external factors that control the growth and maturation process in fish, including how these are controlled by the genetic background of the fish and/or controlled by environmental factors. He has published more than 170 peer review papers in reputed journals.

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