

C'Animation Scientifique



> JEUDI 20 JANVIER 2022, 13h45 \ 14h30

Ecophysiological performance and life cycle strategies of North Sea shrimps

The brown shrimp, *Crangon crangon*, is well adapted to the variable environmental conditions in the southern North Sea. It is very abundant, has high reproduction rates, and holds a key position in coastal ecosystems. This species has very low lipid deposits in the midgut gland, suggesting that the main function of the midgut gland is metabolic turnover rather than energy storage. Based on seasonal gene expression studies and established transcriptome data, key components of lipid metabolic pathways were investigated. Gene expression of triacylglycerol lipase, phospholipase, and fatty acid desaturase were analyzed and compared with that of other digestive enzymes involved in lipid, carbohydrate, and protein catabolism. The results suggest that gene expression of digestive enzymes involved in lipid metabolism is modulated by the lipid content in the midgut gland and is related to food availability. Brown shrimp seem to be capable of using cellular phospholipids during periods of food paucity but high energetic (lipid) requirements. Two of three isoforms of fatty acid binding proteins (FABPs) from the midgut gland involved in fatty acid transport showed specific mutations of the binding site. We hypothesize that the mutations in FABPs and deficiencies in anabolic pathways limit lipid storage capacities in the midgut gland of *C. crangon*. In turn, food utilization, including lipid catabolism, has to be efficient to fulfill the energetic requirements of brown shrimp.

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