

**POLYUNSATURATED FATTY ACIDS BIOSYNTHESIS IN THE COMMON OCTOPUS  
(*Octopus vulgaris*)**

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The common octopus is a prime candidate to diversify marine aquaculture in the Mediterranean. However, its culture is hindered by massive mortalities occurring during early life-cycle stages (paralarvae). Polyunsaturated fatty acids (PUFA) have been identified as essential compounds for the octopus paralarvae, but precise dietary requirements have not been yet determined. To identify the dietary essential fatty acids (EFA) for paralarval stages of the common octopus, a characterization of the enzymes of endogenous PUFA biosynthetic pathways has been undertaken. We report on the investigations carried out to characterise several genes encoding desaturase and elongase enzymes that mediate the production and metabolism of EFA in the common octopus. Briefly, we isolated a stearoyl-CoA desaturase with  $\Delta 9$ -desaturase activity, and a fatty acyl desaturase with  $\Delta 5$ -desaturase activity, the latter enabling the octopus to endogenously produce both arachidonic and eicosapentaenoic acids from adequate precursors. Additionally, we have confirmed the presence of at least two cDNAs encoding elongases of very long-chain fatty acids (Elovl), the so-called Elovl2/5 with elongation ability towards C18 and C20 PUFA, whereas the Elovl4 appears to participate in the biosynthesis of very long-chain ( $C \geq 24$ ) fatty acids.