

The reproductive biology and related lipid dynamics of albacore tuna (*Thunnus alalunga*) in the western Indian Ocean

Z. Dhurmeea, H. Pethybridge, I. Zudaire, M. Cedras, W. West, N. Nikolic, J. Bourjea, C. Appadoo & N. Bodin
dzahirah@hotmail.com

Information on the biology of albacore tuna, *Thunnus alalunga*, in the Indian Ocean is scarce and little new information on the population is available. Here, we examined the reproductive biology of albacore through analysis of sex ratio, spawning area and season, length-at-maturity (L50) and spawning frequency and fecundity. Lipid composition through analysis of lipid class and fatty acid profiles of reproductive and somatic tissues was also examined in mature females. A total of 923 female and 867 male albacore were caught from 2013 to 2015 and considered for the reproductive study, from which 47 females were further sampled by taking ~2g of fresh muscle, liver and gonads to investigate lipid dynamics. A bias in sex ratio was found in favour of females with fork length (LF) <100 cm. Spawning occurs within 10-30 °S, mainly to the east of Madagascar from October to January. L50 was estimated at 85.3 ±0.7 cm LF at the vitellogenic 3 stage maturity threshold. Batch fecundity and relative batch fecundity were estimated at 0.26-2.09 million eggs and 53.4 ±23.2 oocytes g⁻¹ of somatic-gutted weight, respectively. Highest total lipid (TL) contents were recorded in spawning gonads (mainly phospholipids, PL, triacylglycerol, TAG and wax esters, WE) and in the liver of post-spawning females (TAG and PL). Muscle TL was low with high inter-individual variability. Correlations between organo-somatic indices and Fulton's condition factor with TL, WE and TAG in albacore tissues suggest that albacore are primarily capital breeders relying mostly on stored lipids before the onset of reproduction. Overall, the three tissues had similar general fatty acid profiles with the dominance of 22:6ω3 (DHA), 16:0, 18:0 and 18:1ω9. The proportions of those fatty acids in addition to 20:5ω3 (EPA) and 20:4ω6 (AA) varied with maturity stage and ovary pair, revealing that the smaller gonad could contribute potentially more into the reproductive potential.