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O Presidente da República

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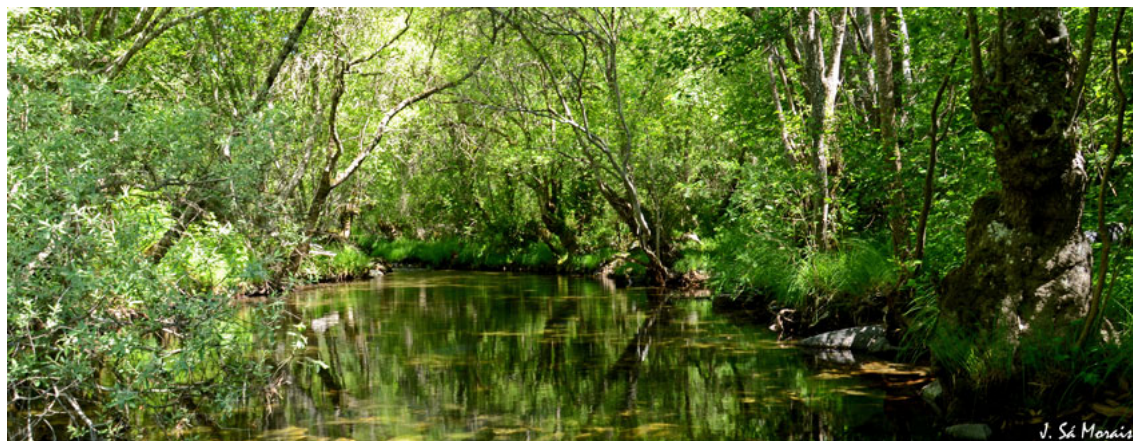
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Evaluation of fatty acids of salmon from different origins: comparison of extraction and derivatization methodologies

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Global demand for fish and fish products has increased significantly over the last decades, which led to a simultaneous increase of aquaculture production around the world, currently corresponding to almost 50% of the global fish market [1]. Among different concerns regarding the fish that consumers are eating, nowadays, there is a demand for correct information about the species, production method (farmed vs. wild) and the catch origin/provenience of fish. Salmon, one of the most popular fish in Europe, can have different geographical origins and generally command higher prices when caught in the wild. Moreover, the commercially important species of salmon belong to different genus, namely *Salmo* and *Oncorhynchus*. Therefore, this work intended to compare the fatty acid composition of salmon from diverse origins, testing different extraction and derivatization methodologies.

Farmed salmon specimens were obtaining from Chile, Canada and Norway. Two lipid extraction methods, namely conventional Soxhlet extraction using *n*-hexane added with butylated hydroxytoluene (BHT) and an adaptation of the Bligh and Dyer extraction using ultra-turrax homogenisation with 1% NaCl, followed by extraction with chloroform and methanol, were tested. Additionally, fatty acid methyl esters (FAME) were prepared by two methodologies, namely by alkaline transmethylation using KOH and by acid-catalysed transmethylation using boron trifluoride-methanol solution. FAME were analysed in a Shimadzu GC-2010 Plus gas chromatograph equipped with a Shimadzu AOC-20i auto-injector and a flame ionisation detector (Shimadzu, Japan). A CP-Sil 88 silica capillary column (50 x 0.25 mm i.d, 0.20 µm) from Varian (Middelburg, Netherlands) was used for FAME separation. Injector and detector temperatures were 250 and 270 °C, respectively. The compounds were identified by comparison with standards (FAME 37, Supelco, Bellefonte, PA, USA).

Based on the obtained results, the ultra-turrax method was chosen for lipid extraction since it allowed obtaining higher amounts of long chain unsaturated fatty acids, particularly of docosahexaenoic acid (DHA). Similar results were obtained for both tested derivatization methodologies. Nonadecanoic acid (C19:0) was submitted to BF₃/MeOH derivatization resulting in a high transmethylation yield (90.3%). In general, salmon samples showed high contents of polyunsaturated fatty acids, including ω-3 fatty acids, which supports its consumption as part of a healthy diet.

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