Development of therapeutic and cosmetic formulations based on sardine-based products

Artur Ribeiro\textsuperscript{1,2}, Cidália Borges\textsuperscript{1,2}, Filipa Sousa\textsuperscript{1,2}, Isabel Oliveira\textsuperscript{2}, Irineu Batista\textsuperscript{3}, Narcisa M. Bandarra\textsuperscript{3}, Andreia C. Gomes\textsuperscript{2}, Artur Cavaco-Paulo\textsuperscript{1}

\textsuperscript{1} CEB - Centre of Biological Engineering, Department of Biological Engineering, University of Minho, Campus of Gualtar, 4710-057, Braga, Portugal
\textsuperscript{2} Centre of Molecular and Environmental Biology (CBMA), Department of Biology, University of Minho, Campus of Gualtar, 4710-057, Braga, Portugal
\textsuperscript{3} Instituto Português do Mar e da Atmosfera (IPMA), Av. de Brasília, 1449-006 Lisboa, Portugal

Contact e-mail: cidaliarmborges@gmail.com

Abstract

Sardine is one of the most common fish of the Portuguese coast and has important nutritional features. Sardine oil is also a source of nutrients with proven benefits for human health, being rich in polyunsaturated fatty acids (PUFAs) [1]. Several studies show that there is a direct link between a diet enriched in omega-3 and the prevention of diseases such as cardiovascular disease, inflammatory conditions such as rheumatoid arthritis or asthma, mental disorders and prevention of various types of cancer [2].

The aim of this work was to characterize in a systematic way the potential protective role of sardine oil and derived PUFAs. To evaluate the antioxidant and anti-inflammatory effect of sardine oil and PUFAs, human fibroblasts (BJ-5ta), human melanocytes (A375) and human keratinocytes (NCTC2544) were used. Cell viability was affected for concentrations higher than 8mg/ml for sardine oil and higher than 0.1mg/ml for PUFAs. However and regarding PUFAs, melanocytes revealed a higher susceptibility. With the lowest tested concentrations, sardine-based compounds promoted cell proliferation and protected cells from induced oxidative stress, with higher protection conferred by PUFAs. These results open the opportunity to develop new therapeutic and cosmetic applications based on sardine-derived compounds. Their incorporation in topical creams may contribute to a better treatment of inflammation and in the prevention of skin aging.