

Effects of elderflower extract enriched with polyphenols on antioxidant defense of salmon leukocytes

Santana, P.A.
Jara-Gutiérrez, C.
Mellado, M.
Forero, J.C.
Guzmán, F.
Barriga, A.
Albericio, F.
Álvarez, C.A.

Abstract

Background: In fish farming, the plant extracts containing antioxidant compounds have been added to the diet for enhancing pathogen resistance. In vitro studies evaluating the antioxidant effect of herbal extracts on fish cell models have focused on ROS production and the respiratory burst mechanism. However, the effects on enzymatic antioxidant defense on salmon leukocytes have not been evaluated. This study aims to evaluate the enzymatic antioxidant defense and ROS-induced cell damage in Salmon Head Kidney-1 (SHK-1) cell line exposed to polyphenol-enriched extract from *Sambucus nigra* flowers. **Results:** Firstly, the Total Reactive Antioxidant Power (TRAP) assay of elderflower polyphenol (EP) was evaluated, showing 459 and 489 times more active than gallic acid and butyl hydroxy toluene (BHT), respectively. The toxic effect of EP on salmon cells was not significant at concentrations below 120 µg/mL and no hemolysis activity was observed between 20 and 400 µg/mL. The treatment of SHK-1 cell line with EP decreased both the lipid peroxidation and protein oxidation induced by H₂O₂, which could be associated with decreasing oxidative stress in the SHK-1 cells since the GSH/GSSG ratio increased when only EP was added. **Conclusions:** These results suggest that plant extracts enriched with polyphenols could improve the enzymatic antioxidant defense of salmon leukocytes and protect the cells against ROS-induced cell damage. **How to cite:** Santana PA, Jara-Gutiérrez C, Mellado M, et al. Effects of elderflower extract enriched with polyphenols on antioxidant defense of salmon leukocytes. *Electron J Biotechnol* 2021;51. <https://doi.org/10.1016/j.ejbt.2021.04.004>

Author keywords

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Fish farming
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Plant extracts

Rainbow trout (*Oncorhynchus mykiss*)
ROS-induced cell damage
Salmon leukocyte