

Purification of Eicosapentaenoic Acid (EPA) and Docosahexaenoic Acid (DHA) from Fish Oil Using HPLC Method and Investigation of Their Antibacterial Effects on Some Pathogenic Bacteria

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Abstract : The aim of this study was to purified eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), that are essential oils from trout oil, using high-performance liquid chromatography (HPLC) method, bioconverted EPA and DHA into bioconverted EPA (bEPA), bioconverted DHA (bDHA) extracts by *P. aeruginosa* PR3. Moreover, in vitro antibacterial activity of bEPA and bDHA was investigated using disc diffusion methods and minimum inhibitory concentration (MIC). EPA and DHA concentration of 11.1% and 15.9% in trout oil increased in 58.64% and 40.33% after HPLC optimisation, respectively. In this study, EPA and DHA enriched products were obtained which are to be used as valuable supplements for food and pharmaceutical purposes. The bioconverted EPA and DHA exhibited antibacterial activities against two Gram-positive bacteria (*Listeria monocytogenes* ATCC 7677 and *Staphylococcus aureus* ATCC 29213) and six Gram-negative bacteria (*Pseudomonas aeruginosa* ATCC 27853, *Escherichia coli* ATCC 25922, *Klebsiella pneumoniae* ATCC700603, *Enterococcus faecalis* ATCC 29212, *Aeromonas hydrophila* NCIMB 1135, and *Salmonella Paratyphi A* NCTC 13). Inhibition zones and MIC value of bEPA and bDHA against bacterial strains ranged from 7 to 12 mm and from 350 to 2350 µg/mL, respectively. Our results suggested that the crude extracts of bioconversion of EPA and DHA by *P. aeruginosa* PR3 can be considered as promising antimicrobials in improving food safety by controlling foodborne pathogens.

Keywords : High-Performance Liquid Chromatography (HPLC), docosahexaenoic acid, DHA, eicosapentaenoic acid, EPA, minimum inhibitory concentration, MIC, *Pseudomonas aeruginosa* PR3

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