

Microencapsulated PUFA: A New Functional Food Ingredient against Cardiovascular Diseases

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Fish oil considered as a perfect diet because of its high digestibility and bioactivity. It contains high amount of polyunsaturated n-3 fatty acids such as EPA and DHA. However, it can undergo oxidation easily resulting in the formation of toxic off flavor compounds such as peroxides and hydro peroxides. These compounds adversely affect the nutritional quality and reverse any cardiovascular benefits. By using microencapsulation with various biopolymers we can solve this problem. This encapsulated PUFA rich oil will possess numerous health benefits. The current study aimed to investigate the possible protective effect of encapsulated PUFA against doxorubicin-induced cardiotoxicity and the underlying mechanisms. In vitro cytotoxicity evaluation was conducted using H9c2 cardiomyocytes. MTT assay revealed that effective cytoprotective effect was induced by a sample concentration of 12.5µg/mL. Results of apoptosis by double fluorescent staining with acridine orange/ethidium bromide and Caspase-3 evaluation by ELISA substantiated the above findings. Further, flowcytometric determination of membrane potential, relative expression of NF-κB by PCR, and ROS determination using DCFH-DA also confirmed the protective effect of encapsulated sardine oil against doxorubicin induced cardiotoxicity. NF-κB expression was down-regulated nearly by 50% on cells treated with encapsulated fish oil. Altogether the results revealed that these microparticles demonstrated cell protection against doxorubicin-induced oxidative stress.

Keywords: PUFA; Cardio toxicity; Doxorubicin. Microencapsulated fish oil.

Biography:

Vishnu K. V. Expertise in Microencapsulation of marine lipids and its health benefits. He has multiple years of experience in research in the field of Biochemistry and Molecular biology. He is currently working on stabilization of nutritionally important marine lipids by microencapsulation with polysaccharide-protein complex.