



Official Journal of TESMA

Regenerative Research

www.regres.tesma.org.my
E-ISSN 2232-0822

Tissue Engineering
and Regenerative
Medicine Society of
Malaysia

Regenerative Research 7(1) 2018 55

NATURAL HYDROXYAPATITE FROM TILAPIA FISH SCALES AS POTENTIAL BIOMATERIAL FOR MEDICAL DEVICES

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ARTICLE INFO

Published: 26th August 2018

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KEYWORDS

Alkaline digestion;
natural nanohydroxyapatite;
fish scale;
calcium apatite

SUMMARY

Fish scales have been the best alternatives source of hydroxyapatite due to low manufacturing cost and safety issues. Low cost and fast extraction method has been explored including alkaline treatment. This study presents the extraction of natural hydroxyapatite from Tilapia fish scales using alkaline treatment and the potential use of this material for medical devices. Sodium hydroxide (NaOH) with concentration of 5M was chosen to extract HA from fish scales. Fourier transformed infrared spectroscopy (FTIR) and X-ray diffraction (XRD) analyses were used to confirm the structure of fish scales HAp (FsHAp) produced from the fish scale. The morphology of the FsHAp obtained was analysed using scanning electron microscopy (SEM) with transmission mode (STEM). Cytotoxicity study was conducted to confirm the biocompatibility properties of this materials. The STEM analysis reveals the ultrafine nanoparticles of HAp with diameter around 20-30 nm. Sintering of FsHAp at 1200 °C produced highly crystalline FsHA with Ca/P ratio was 1.83 as determined by energy dispersive X-ray (EDX) indicated the. The XRD results confirmed the structure of sintered FsHAp with the presence of secondary phase known as beta tricalcium phosphate (β -TCP). The FsHA is confirmed to be biocompatible and suitable materials for biomedical applications.