

Mineral composition of the cockle (*Anadara granosa*) shells of West Coast of Peninsular Malaysia and it's potential as biomaterial for use in bone repair

ABSTRACT

The study was conducted to determine the mineral composition of cockle (*Anadara granosa*) shells from 3 major cockle cultivation sites in the West Coast of Malaysia. Three samples of cockle shells from three different sources were evaluated to determine the content of 12 macro- and micro-elements: Calcium (Ca), Carbon (C), Magnesium (Mg), Sodium (Na), Phosphorus (P), Potassium (K), Iron (Fe), Copper (Cu), Nickel (Ni), Zinc (Zn), Boron (B) and Silicon (Si). For convenience and ease of reference, Ca and C were combined into one unit (Calcium carbonate, CaC) while Mg, Na, P and K were evaluated individually and Fe, Cu, Ni, Zn, B and Si were evaluated as one group (others). Analysis of mineral content was done using coupled plasma, auto analyser, atomic absorption spectrophotometer and carbon analyser. Results showed that the mineral composition of cockle shells from 3 different sources in the West Coast of Peninsular Malaysia were similar for all the samples. CaC comprised more than 98.7% of the total mineral content. Mg, Na, P, K and others (Fe, Cu, Ni, B, Zn and Si) comprised about 1.3%. The mineral composition of cockle shells from the West Coast of Peninsular Malaysia was 98.7% CaC, 0.05% Mg, 0.9% Na, 0.02% P and 0.2% others.

Keyword: Cockle (*Anadara granosa*) shells; Mineral compositions; Biomaterial; Coral