



The physical characteristics and chemical composition of coral claimed to be from Philippines



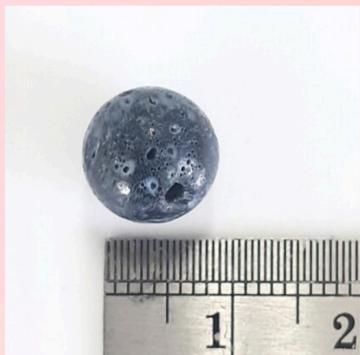
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INTRODUCTION

Coral is an organic gemstone composed of calcium carbonate (CaCO_3), with some varieties having an aragonite structure. The coral bead samples in this study were divided into two groups: (1) ten blue coral bead samples and (2) ten red coral bead samples, totaling 20 samples, each with a diameter of 8 mm. Basic instrumental analysis revealed that the specific gravity ranged from 1.80 to 2.20, and testing under ultraviolet Lamp (UV-LAMP). Advanced instrumental analysis identification showed that blue coral consists of aragonite, while red coral consists of aragonite along with calcite and magnesium, which are the main components of corals found in marine saltwater environments.



(Figure 1) Blue coral sample.



(Figure 2) Red coral sample.

MATERIAL AND METHODS

This study examined a total of 20 coral samples, divided into 10 red coral samples and 10 blue coral samples, to investigate the physical and chemical characteristics of corals claimed to be Philippines. Additionally, the study aimed to identify and classify both coral types using basic and advanced analytical instruments.

The basic instruments used included a single-pan hydrostatic balance and an ultraviolet (UV) lamp, while the advanced instruments included Fourier-transform infrared spectroscopy (FTIR) to analyze color enhancement through dyeing and to study internal bonding within the coral structure, Scanning Electron Microscopy and Energy-Dispersive X-ray Spectroscopy (SEM-EDS) to examine surface morphology and chemical composition, and X-ray Diffraction (XRD) to determine the mineral composition of the corals.

REFERECNE

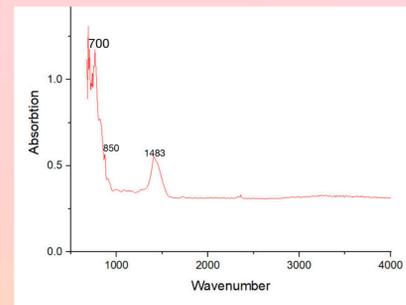
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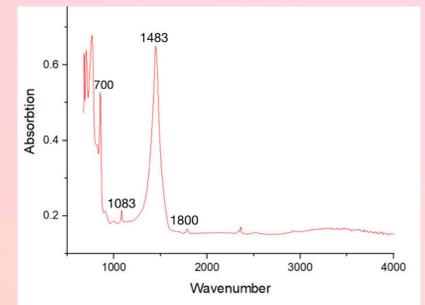
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RESULT AND DISSCUSSION

FTIR



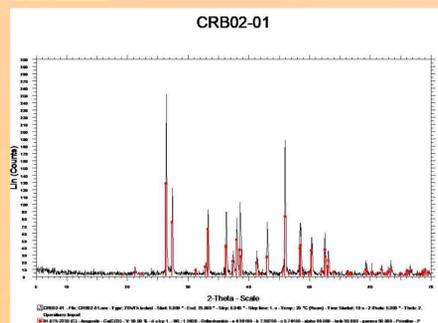
(Figure 3) Blue coral FTIR absorption.



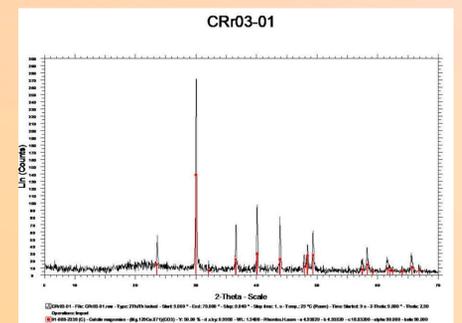
(Figure 4) Red coral FTIR absorption.

the powder of red coral exhibited absorption as follows the range from 800 to 850 cm^{-1} corresponds to the C-O out-of-plane bend, the peak at 1483 cm^{-1} corresponds to CO_3^{2-} asymmetric stretching, and the range from 3200 to 3600 cm^{-1} corresponds to water OH stretching. For blue coral, absorption was observed at 800 cm^{-1} , which corresponds to the C-O out-of-plane bend, indicating the presence of aragonite. The peak at 1080 cm^{-1} corresponds to CO_3^{2-} symmetric stretching, and the peak at 1480 cm^{-1} corresponds to CO_3^{2-} asymmetric stretching. The range from 3200 to 3600 cm^{-1} corresponds to water OH stretching.

XRD



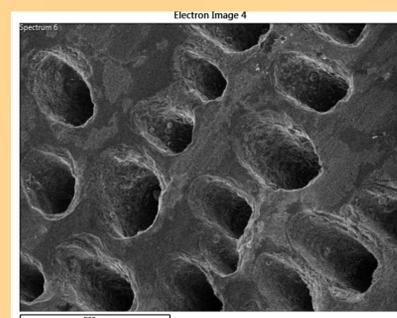
(Figure 5) Blue coral XRD absorption.



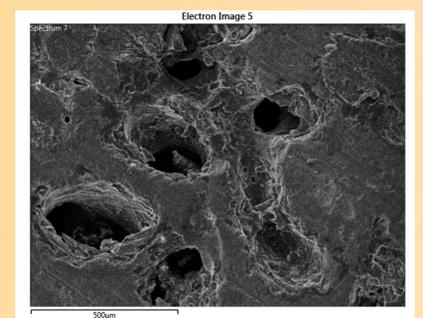
(Figure 6) Red coral XRD absorption.

XRD revealed that the mineral compositions of samples contained of red coral is calcite magnesium and blue coral has only aragonite mineral.

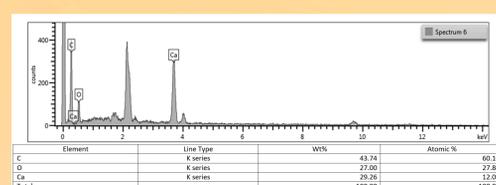
SEM-EDS



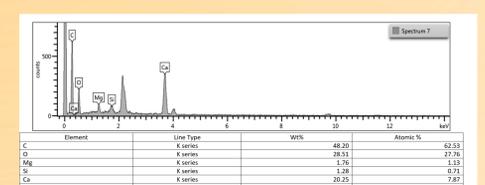
(Figure 7) SEM image blue coral structure.



(Figure 8) SEM image red coral structure.



(Figure 9) EDS blue coral composition



(Figure 10) EDS red coral composition

EDS show The Chemical composition with the composed of blue coral has a calcium, carbon, oxygen and red coral has a calcium, carbon, oxygen, magnesium and silicon.