THE EFFECT OF DIFFERENT PROCESSING CONDITIONS ON COCOA BEAN (*Theobroma cacao*) NIBS AND SHELLS: DETERMINATION OF THEIR ANTIOXIDANT AND ANTIMICROBIAL ACTIVITIES

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Interest in polyphenols has increased recently due to the array of possible benefits they offer in regard to human health in relation to cancer treatment and prevention, cardiovascular diseases and other pathologies. This study was carried out to determine the total flavonoid content (TFC), total phenolic content (TPC), total antioxidant content (TAC), scavenging activity (ABTS), Ferric reducing ability (FRAP) and the antimicrobial activity of cocoa bean nibs in comparison to cocoa bean shells in two different processing stages (Roasted and Unroasted) with regards to the solvents (water and Methanol) which were used for extraction. In general, 80% methanol extracts showed higher antioxidant capacity compared to water extracts. It was also concluded that cocoa nibs contain a greater amount of total phenolic and flavonoid content when compared to cocoa shells. Antimicrobial activity was determined by measuring the diameter of the zone of inhibition. It was measured for both water and 80% methanol extracts of the samples on the test organisms *Escherichia coli* and *Staphylococcus aureus.* The 80% methanol extract samples showed higher inhibition than the water extract samples except for the water extracts of unroasted shell compared to the *Staphylococcus aureus*, which showed a higher inhibition zone than the unroasted shell. Results revealed that the inhibition of *Escherichia coli* is higher compared to the inhibition of *Staphylococcus aureus*. Hence it can be concluded that both the cocoa nibs and shells are able to reduce free radicals in our body and thereby demonstrate an impact on human health.

Keywords: Free radical, Antioxidant, Antimicrobial, Cocoa shell, Cocoa nib, Roasted, Unroasted

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