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Physical and Morphological Properties of Snail (*Achatina Fulica*) Shells for Beneficiation into Biocomposite Materials

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ABSTRACT:

In this study, microhardness and flow strength (tensile) of a shell of an African Giant snail (*Achatina Fulica*) were studied as a function of indentation load. The influence of loading direction on the hardness of the nacreous and prismatic structure of the shell material was analyzed. The results revealed that microhardness measured on the shell was dependent on the load on the nacreous and prismatic structures. Indentation loading between 50 and 500 kN induced tensile strengths that ranged between 675–1050 and 390–810 MPa on the prismatic and nacreous layers, respectively. In addition, the morphology of the shell surface exhibited an interlocking structure with a large surface for binding to the organic matrix. The observed reinforcement of the shell explained the hardness property of the shell. The improved hardness of the shell implies that it can be beneficiated into filler that may be used to improve the mechanical properties of polymeric composite materials.