

Biomimetism of brazil nut

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Abstract:

Bertholetia excelsa has a dry, woody fruit which stores up to 20 tegumented seeds, known as brazil nuts. Mesocarp is the main fruit layer responsible for protecting the seeds against predators and falls from trees as high as 50 m. Therefore, the mesocarp is an inspiring model for new impact and puncture resistant materials and structures. Here, we evaluated the mechanical behavior of this structure at different length scales to understand the mechanical function of each hierarchal level of organization of mesocarp. The final goal is to identify the principles responsible for mesocarp of brazil nut outstanding mechanical performance and apply them in the production of new bioinspired materials.