

Comparative Fracture Parameters of *Khaya ivorensis* and *Magnolia obovata*: Outlooks for the Development of Sustainable Mobility Materials

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Abstract : Against a backdrop of heightened awareness of environmental impact and the reduction of space debris, the use of sustainable materials for mobility applications is emerging as a promising solution to minimize the environmental footprint of our technologies. Among recent innovative developments in the use of wood, the Japanese species *Magnolia obovata* attracted particular interest when it was used in the design of the first wooden satellite launched in November 2024. The aim of this project is to explore new species that could replace *M. obovata* in a mobile context. *Khaya ivorensis*, a tropical African species, was selected and compared to *M. obovata* in terms of resistance to cracking, a key criterion in the durability of mobility infrastructures. Prior to the cracking tests, *K. ivorensis* and *M. obovata* were characterized to determine their basic mechanical properties. The results presented here relate to this characterization phase, in particular the four-point bending, compression and BING tests, which provided us with strengths and moduli. These results were compared with those found in the literature, which allowed us to observe a number of differences. CHARPY resilience tests were also performed and compare to critical energy release rate in order to estimate the ability of the two species to absorb energy, particularly following impacts and various shocks.

Keywords : energy release rate, *Khaya ivorensis*, *magnolia obovata*, wood for mobility

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