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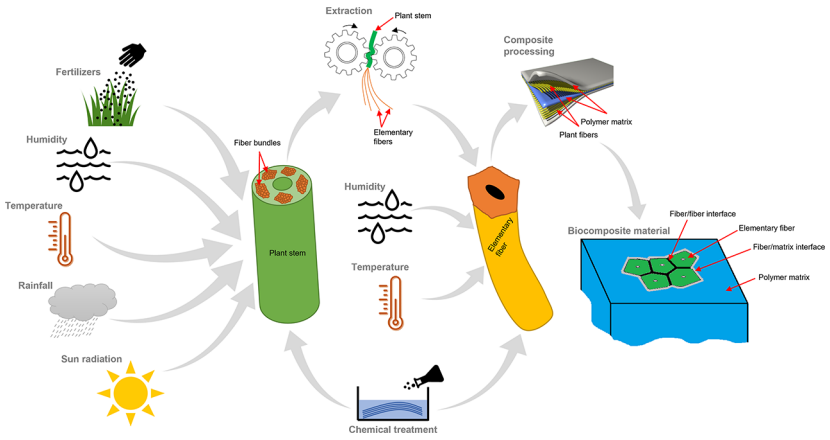
The variability of the mechanical properties of sustainable biocomposite materials limits their widespread application in industry.



Biocomposite materials, which are made of natural plant fibers, are becoming a viable alternative to synthetic composite materials. The economic, ecological, and technical benefits of these materials could aid in the development of sustainable industrial production. Several industries already employ biocomposites, including the automobile, aeronautics, and boating sectors.

However, the variability of biocomposites' mechanical properties limits their use. Chegdani and El Mansori examine the different factors that affect the mechanical properties of biocomposites to better understand the behavior of these eco-friendly materials.

The properties of biocomposites vary due to their multiscale complex cellulosic structure as well as their growth conditions, processing parameters, and chemical treatments. . These factors are vital when using biocomposite materials to design industrial parts, such as automotive or aircraft parts, which require strict tolerances for their performance.

Instead of seeing this variability as a weakness, the authors believe that understanding the impacts on biocomposites' mechanical behavior will help researchers figure out how to improve the performances of these materials, allowing their use to become more widespread in industry. They suggest that further investigation of the functional relationship between these factors and the resulting mechanical properties will help optimize control of these properties.

"This article should be used as a guideline for a better understanding of the different factors affecting the mechanical properties of biocomposites," said author Faissal Chegdani. "We hope that the possible perspectives suggested in this paper will be considered by the readers to develop and intensify the use of these eco-friendly materials in both industrial and daily-life applications."

Source: "Perspectives on the robustness of the mechanical properties assessment of biocomposites," by Faissal Chegdani and Mohamed El Mansori, *Journal of Applied Physics* (2024). The article can be accessed at https://doi.org/10.1063/5.0189109.