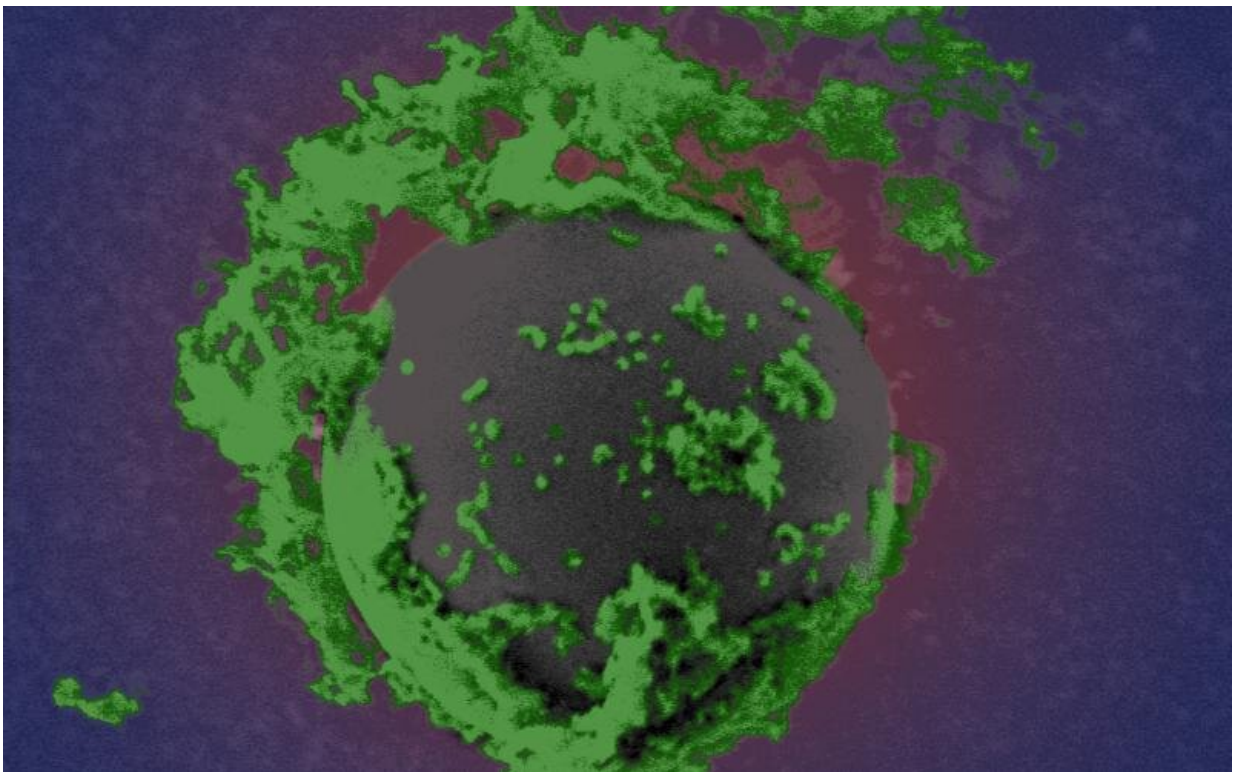


Naturally derived materials fit for 3D printing: Impact of biomass ash content on biocomposite properties

December 8 2022, by Stephanie Seay



Researchers found that moderate levels of ash—sometimes found as spheres in biomass—do not significantly affect the mechanical properties of biocomposites made up of corn stover, switchgrass and PLA thermoplastic. Credit: Andy Sproles/ORNL, U.S. Dept. of Energy

The presence of minerals called ash in plants makes little difference to the fitness of new naturally derived compound materials designed for additive manufacturing, an Oak Ridge National Laboratory-led team found.

When mixed with [polylactic acid](#), fibers sourced from corn stover and switchgrass yielded biocomposites with satisfactory properties for 3D printing. In fact, the presence of ash spheres appeared to improve the flow of material for extrusion printing, said ORNL's Xianhui Zhao.

"We went as high as 12% ash content on our [corn stover](#) biocomposite and found [mechanical properties](#) like stress and strain tolerance and tensile strength to be acceptable," Zhao said.

The research enables a use for high-ash biomass residue from biorefining that could lower the overall cost of producing sustainable fuels and materials.

The research is published in the journal *Composites Part C: Open Access*. Next steps include exploring more biomass materials and testing the composites in a large-volume printer at ORNL.

More information: Xianhui Zhao et al, Impact of biomass ash content on biocomposite properties, *Composites Part C: Open Access* (2022).
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