Supplementary Information:

Extrusion-based additive manufacturing of complex three-dimensional ultra-lightweight materials using the basidiomycete *Fomes fomentarius*

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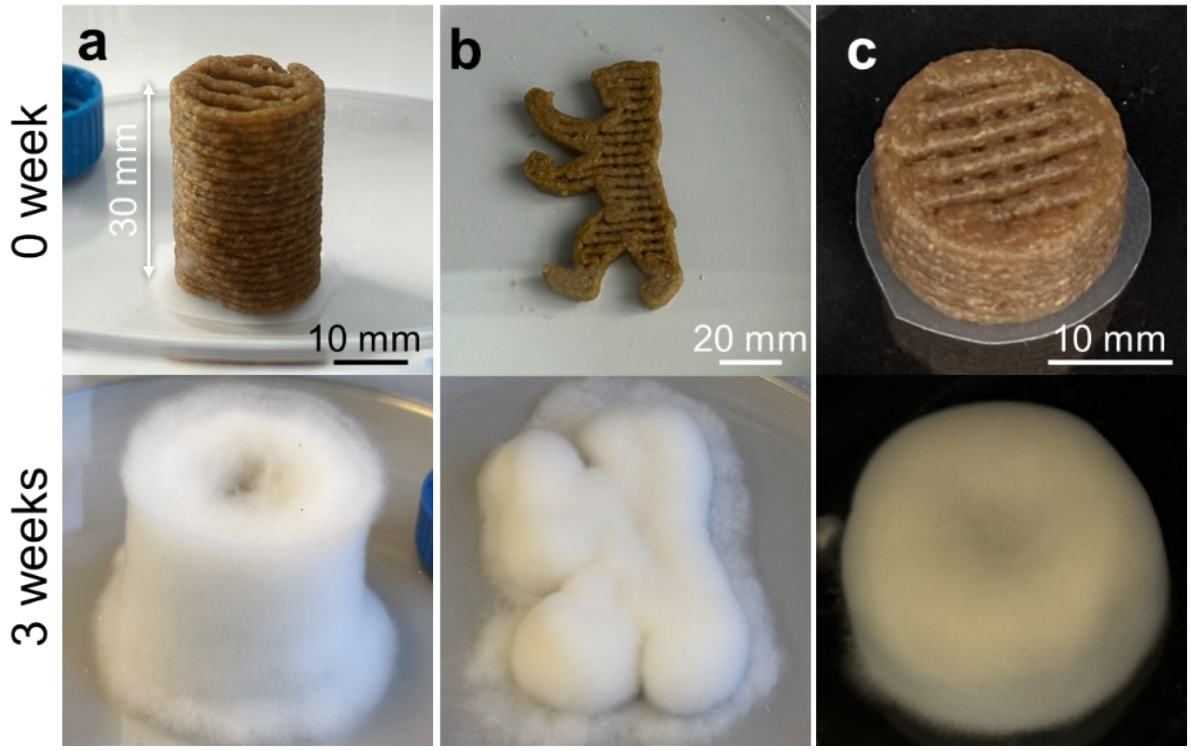

Fig. S1 Various shapes can be printed, and the fungal paste can be preserved at 4 °C without the loss of fungal viability for at least 4 weeks. *(**a**) A Ø 20 mm × 30 mm cylinder before and after three weeks of cultivation without compression. (**b**) An 83 mm × 50 mm × 10 mm Berlin bear before and after three weeks of cultivation without compression. (**c**) A Ø 20 mm × 10 mm cylinder was printed with the four weeks old paste which was preserved at 4 °C for four weeks.*

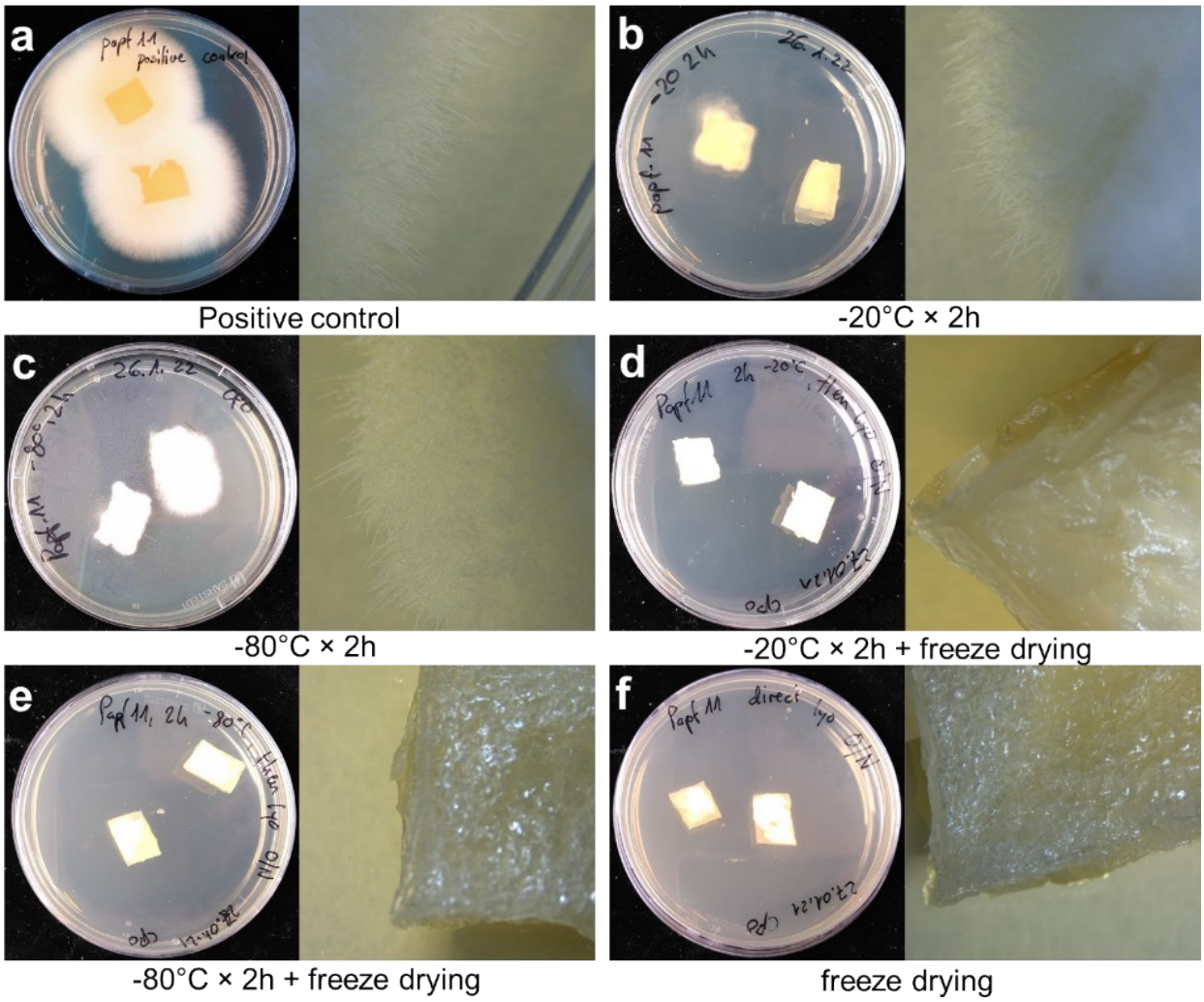

Fig. S2 Freeze-drying fully inactivates F. fomentarius mycelium, whereas short-term freezing reduces viability without complete inactivation. *Agar slices were excised from an overgrown F. fomentarius plate and subjected to one of six treatments prior to transplantation onto CM plates (with the mycelium side contacting the agar): (**a**) direct transplantation (positive control); (**b**) 2 h at -20 °C; (**c**) 2 h at -80 °C; (**d**) 2 h at -20 °C followed by 20 h lyophilization; (**e**) 2 h at -80 °C followed by 20 h freeze drying; and (**f**) direct freeze drying for 2 days. Plates were incubated at 25-26 °C for 5 days. While robust growth was observed in (**a**) and limited regrowth in (**b**) and (**c**), no growth occurred in treatments (**d–f**), demonstrating that freeze drying effectively inactivates the fungus. The magnification used was 2.5×.*

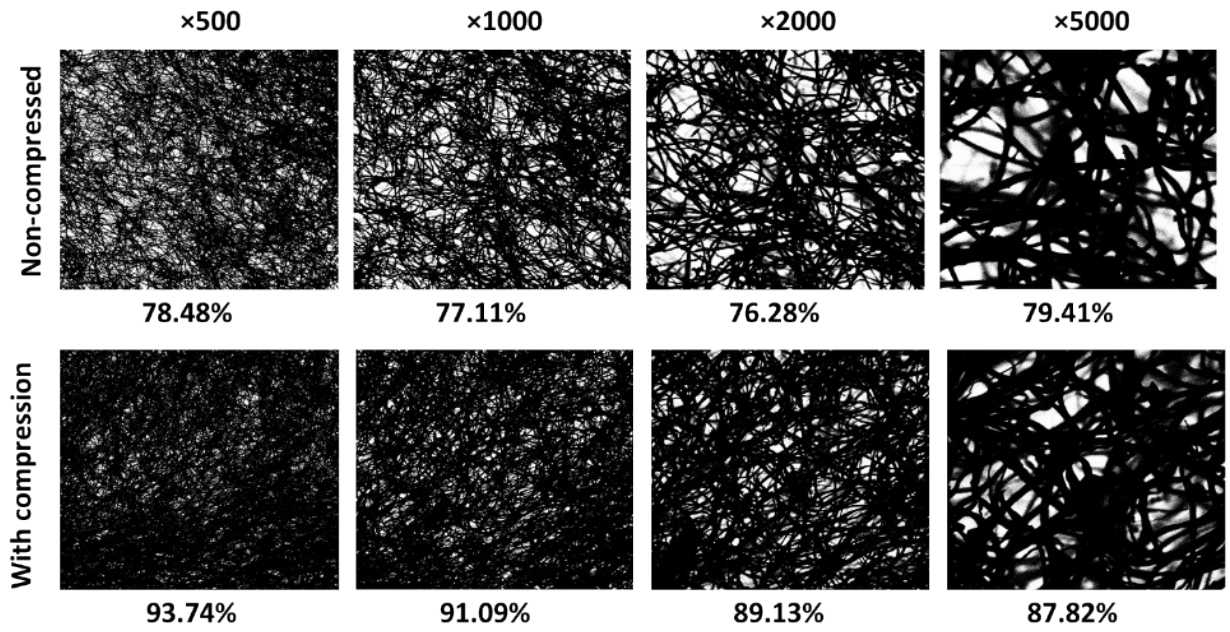

Fig. S3 A densification of hyphal network can be observed after compression. *Hyphal projected density calculated after adjusting the treshold of SEM images at ×500, ×1000, ×2000, and ×5000 magnifications.*

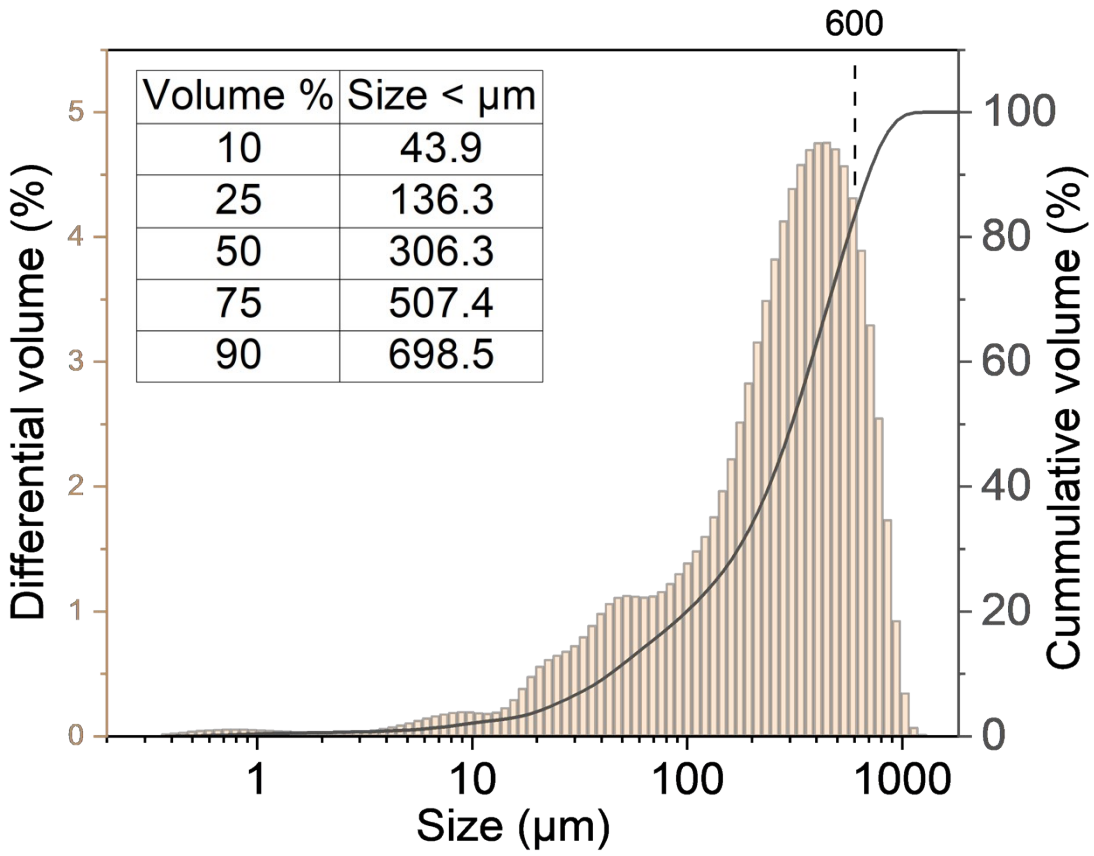

Fig. S4 Particle size distribution of the rapeseed straw powder. *The milled rapeseed has a mean size of 342.5 µm and a median size of 306.3 µm.*