

Microtextured coatings from superhydrophobic bark-derived bioparticles for fog harvesting

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Betulin extraction from birch bark: The birch bark used to extract the betulin was collected in early autumn from the Robson Valley Region of British Columbia, Canada, which was air-dried and stored until the extraction. The betulin extraction from the bark involved a multi-step process. First, 10g dry birch bark and 200 ml ethyl acetate were mixed in a Soxhlet extractor fitted with a reflux. The mixture was boiled under reflux for 36 hr then filtered using a Buchner funnel. The filtrate was charged into a rotary evaporator to recover the solvent. The residue from the evaporator was filtered and washed with distilled water to a neutral pH. The filtrate was dried at room temperature, from which betulin crystals were obtained using isopropyl alcohol. The process can be described as follows. The dry solid from the previous step (1 g) was mixed with isopropyl alcohol (45 mL) in a round-bottom flask and dissolved by heating in a water bath. The hot solution was then filtered using a Buchner funnel. The cooling of the filtrate resulted in crystal betulin.

Table T1 Water contact angles

Betulin	Glass	Silanised glass	Stainless steel	Polyethylene
156°	41°	108°	61°	102°

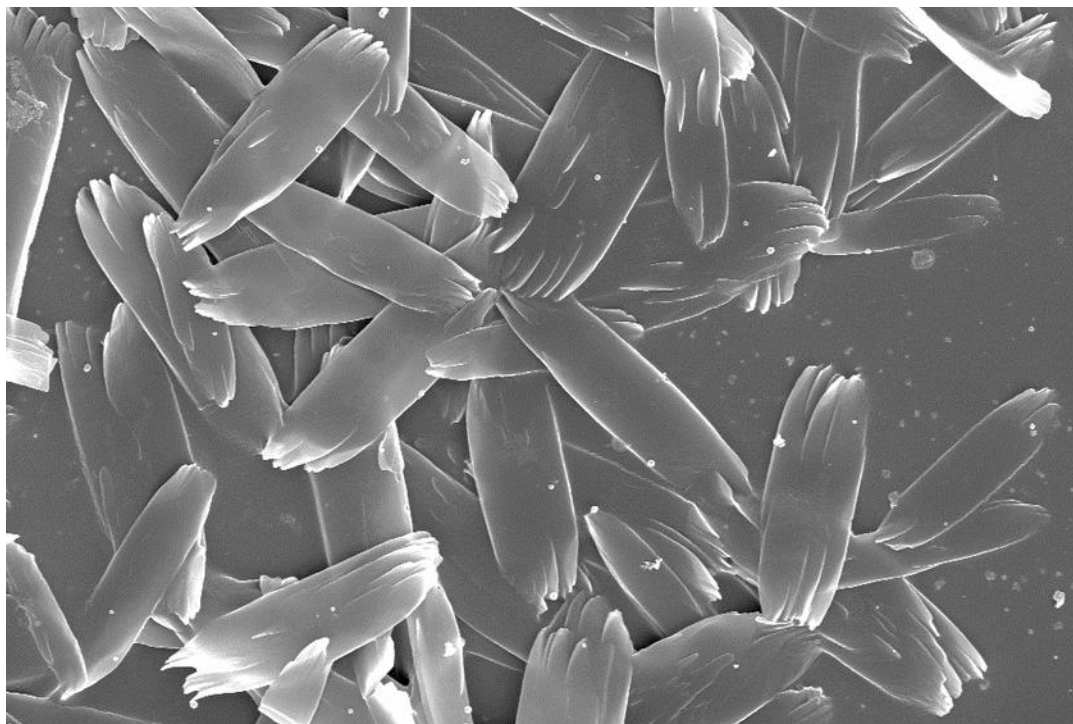


Fig. S1 SEM image of rice grain-shaped betulin particles.



Fig. S2 Water drop (5 μ l) pinning to the betulin-coated surfaces demonstrated through roll-off contact angles. Each column corresponds to a Bet-PLA-2 coating with betulin content displayed at the bottom. The red arrows on the right-hand side indicate the inclinations of the surface in the row.

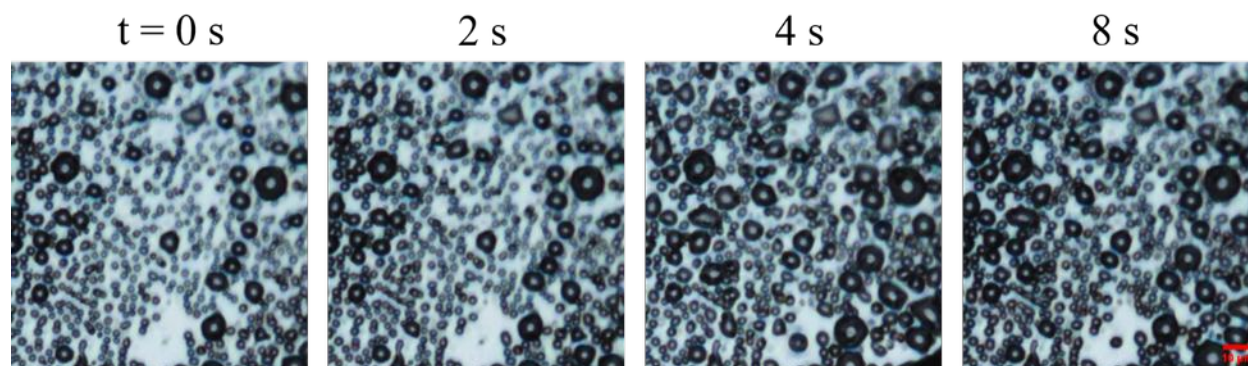


Fig. S3 Image sequence illustrating time-dependent drop growth on a Bet-Lo surface. The images were captured at room temperature while the surface was held horizontally. The scale bar is $10\ \mu\text{m}$ long.

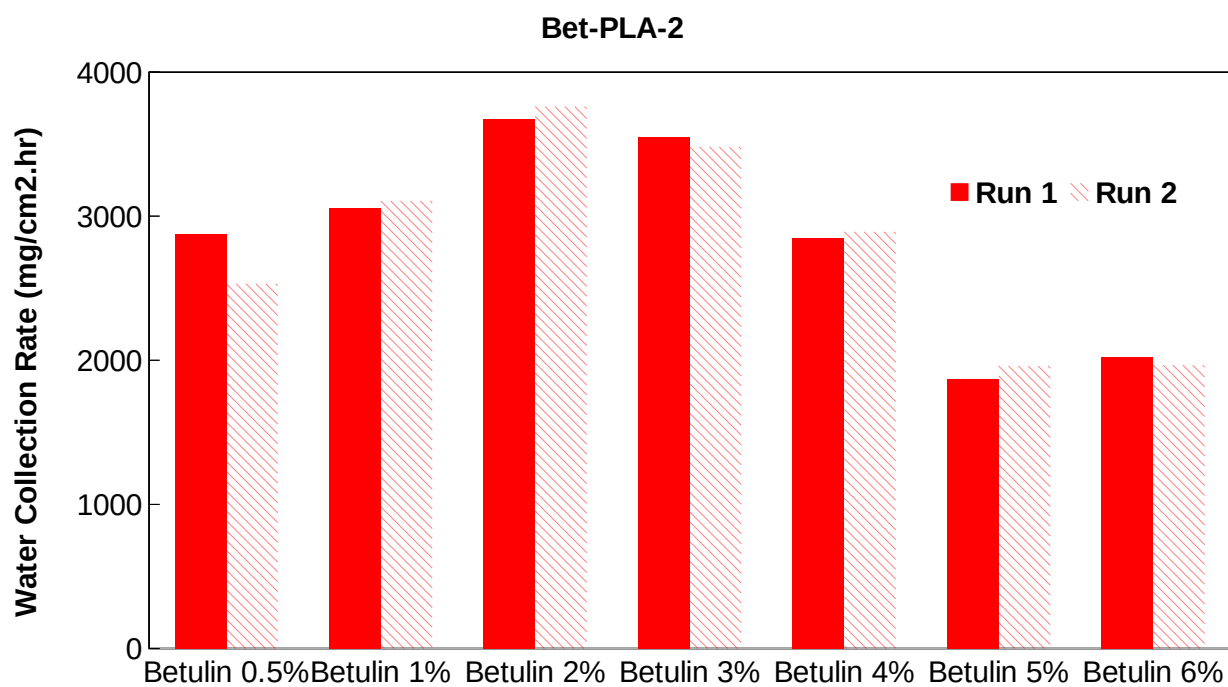


Fig. S4 Time-averaged water collection rates measured on a Bet-PLA-2 coating on two occasions, two months apart. The measurements were conducted at room temperature, without circulation of coolant through the collectors.