

Supporting Information

Effect of Yerba Mate and Silk Fibroin Nanoparticles on the Migration Properties in Ethanolic Food Simulants and Composting Disintegrability of Recycled PLA Nanocomposites

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Instrumental

The hydrodynamic size of either SFN or YMN was measured by means of dynamic light scattering (DLS). The obtained particles, in the powder form, were dispersed at 1 mg·mL⁻¹ in ultrapure deionized water by ultrasonication at 10% of amplitude for 1 minute with a Branson SFX550 (Emmerson Ultrasonic Corporation, Dansbury, USA) and further measured at 20 °C in a Zetasizer Nano series ZSP equipment (Malvern Instrument Ltd., Malvern, UK).

Transmission electron microscopy (TEM) measurements of SFN and YMN were carried out on a Zeiss EM902 (Zeiss, Oberkochen, Germany) and a JEOL JEM-1010 (JEOL Ltd., Tokyo, Japan) operating at 100kV, respectively. YMN suspension was prepared by dissolving 1 mg of YMN powder into 1 mL of water. One droplet of YMN suspension (1 mg mL⁻¹) was deposited on carbon-coated copper grids and dried at room temperature during 25 min before TEM observation.

The cryo-fractured surface microstructure of the cross section of films was observed by means of field emission scanning electron microscopy (FE-SEM). Films were previously sputtered with a palladium/gold layer. PLAV, PLAR and PLA-YMN were observed in a JEOL JSM 7600F microscope (JEOL Ltd., Tokyo, Japan) operating at 5 kV and nanocomposite of PLAR loaded with 2% SFN was observed in a FE-SEM S8000 (Hitachi, Tokyo, Japan) at 20kV

Results

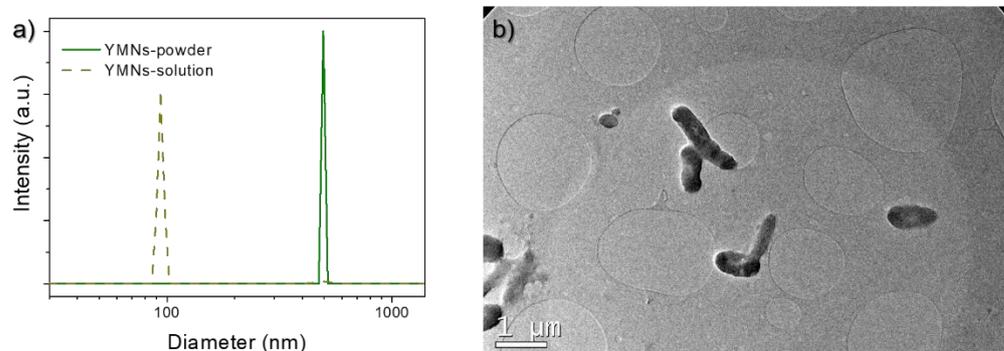


Figure S1. (a) DLS measurements of YMN solution and powder and (b) TEM image of YMN powder.

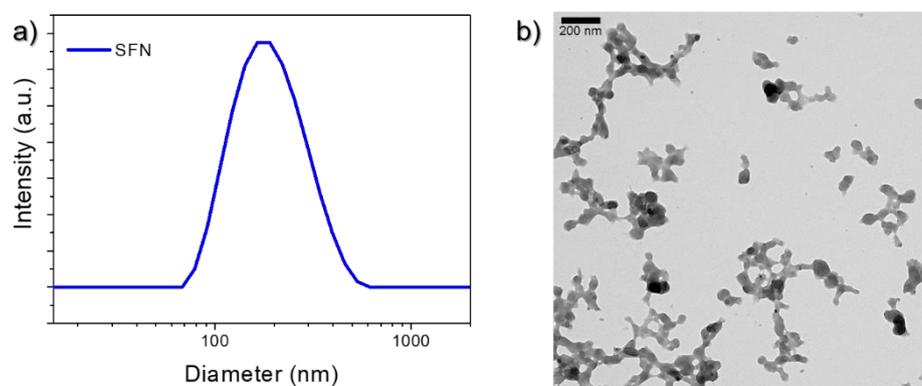


Figure S2. (a) DLS measurements of SFNs and (b) TEM image of SFNs powder.

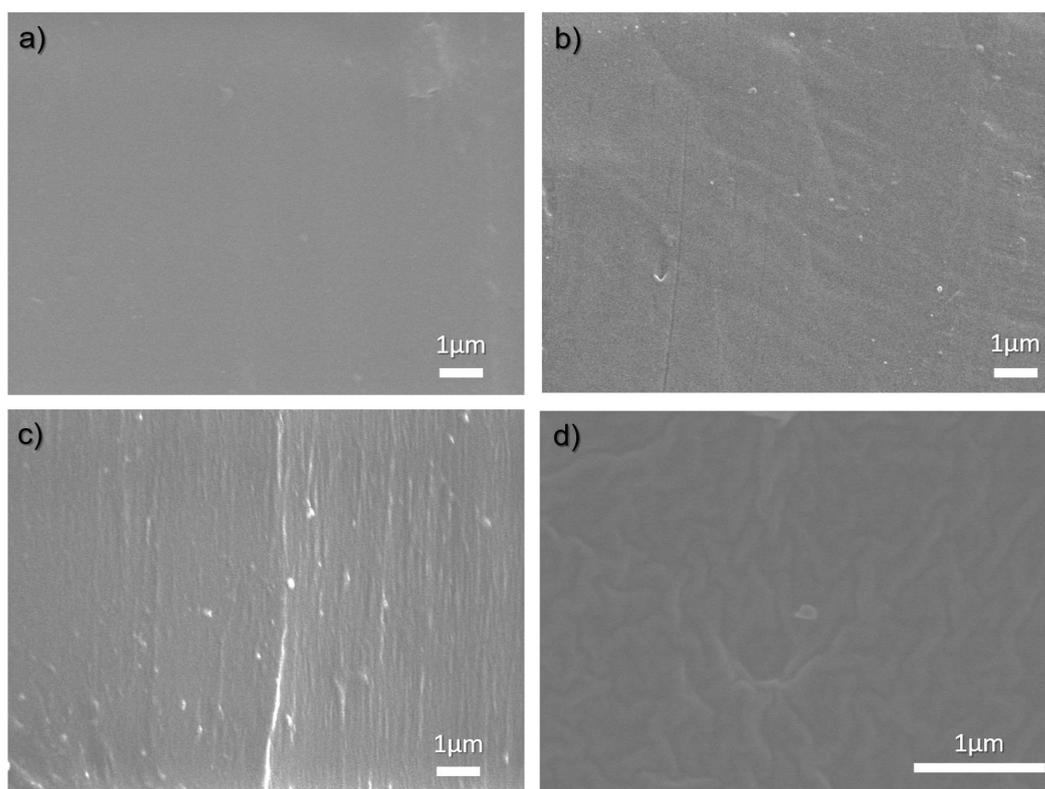


Figure S3. FE-SEM images of: PLAV (a), PLAR (b), and nanocomposites: PLAR loaded with 1% wt. of YMN (c) and PLAR loaded with 2% wt. of SFN (d).