Supporting Information

Single-step fabrication of a large-scale broadband sunlight absorber based on multiple directional grating structures

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Keywords: Biomaterials; Broadband absorbers; Grating structure; Multidirectional grating structure; Photothermal materials; Nanostructures.

S1. Natural *Catharanthus roseus* and *mulberry* leaves

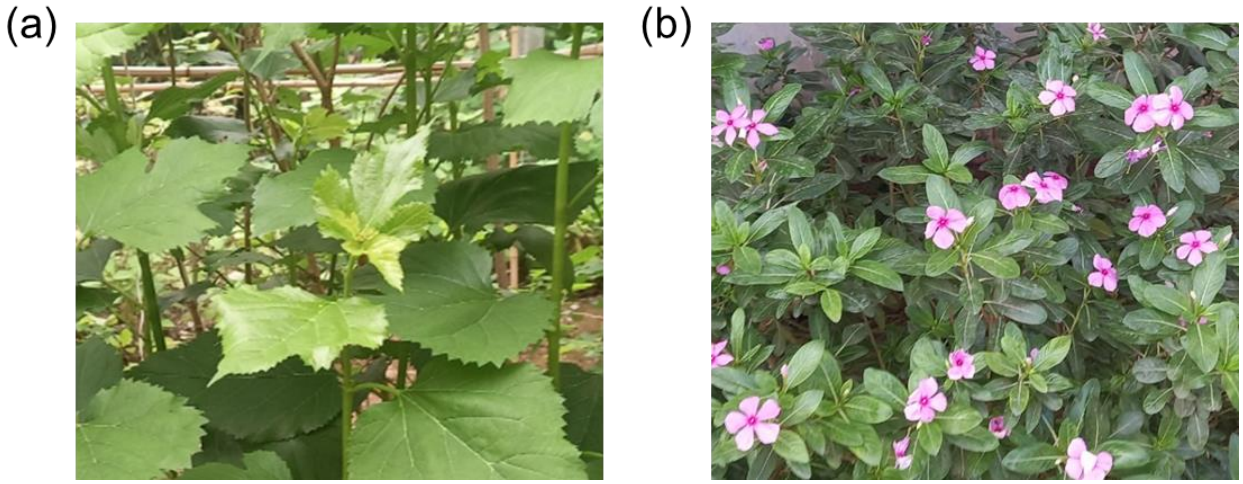

Figure S1. Photographs of (a) *mulberry* (CR) leaf and (b) *Catharanthus roseus* leaf.

S2. Contact angle of the surface leaves

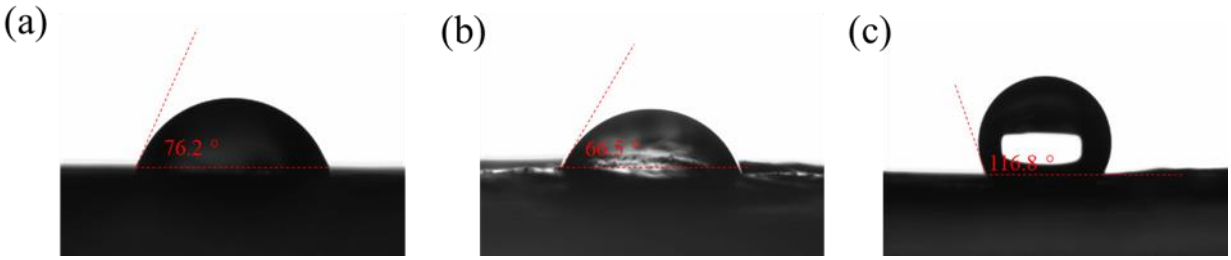

Figure S2. (a) The contact angle of the CR and *mulberry* leaf were 76.2º and 66.5º, respectively, which exhibited the hydrophilic property in the CR and *mulberry* leaf surface. (b) The contact angle of the 10-nm-Au-coated *mulberry* leaf with a 50 nm was 116.8º, exhibiting the hydrophobic property after coating the Au layer onto the surface.

S3. The condition of the Au-coated leaf at 1 day, 6 days, and 14 days after fabrication

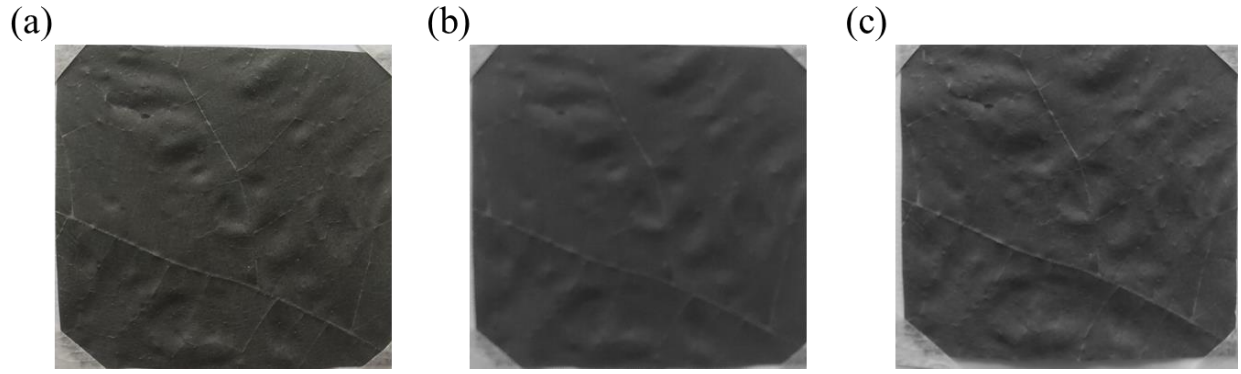

Figure S3. Photograph of the leaf sputtered by 18 nm-thick-Au layer (a) 1 day, (b) 6 days, and (c) 14 days after fabrication under room temperature condition.

S4. Reflection spectra of 23-nm-Au thin film and Au-coated *mulberry* leaf

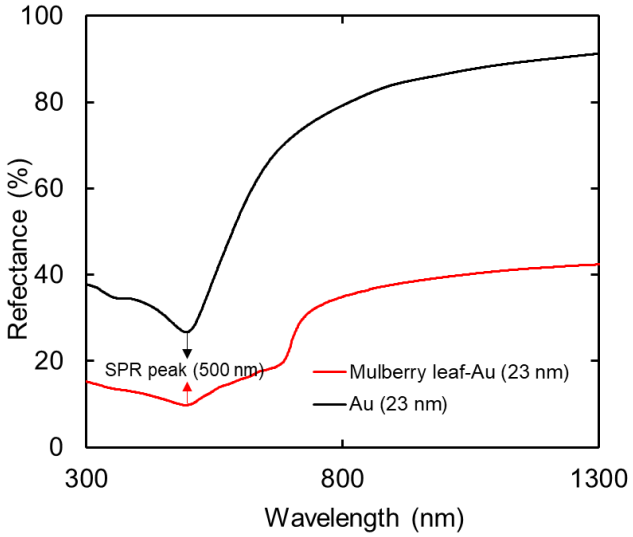

Figure S4. Reflection spectra of 23-nm-Au thin film and Au-coated *mulberry* leaf.

S5. Transmission and scattering reflection spectra of the CR leaf and Au-coated CR leaf

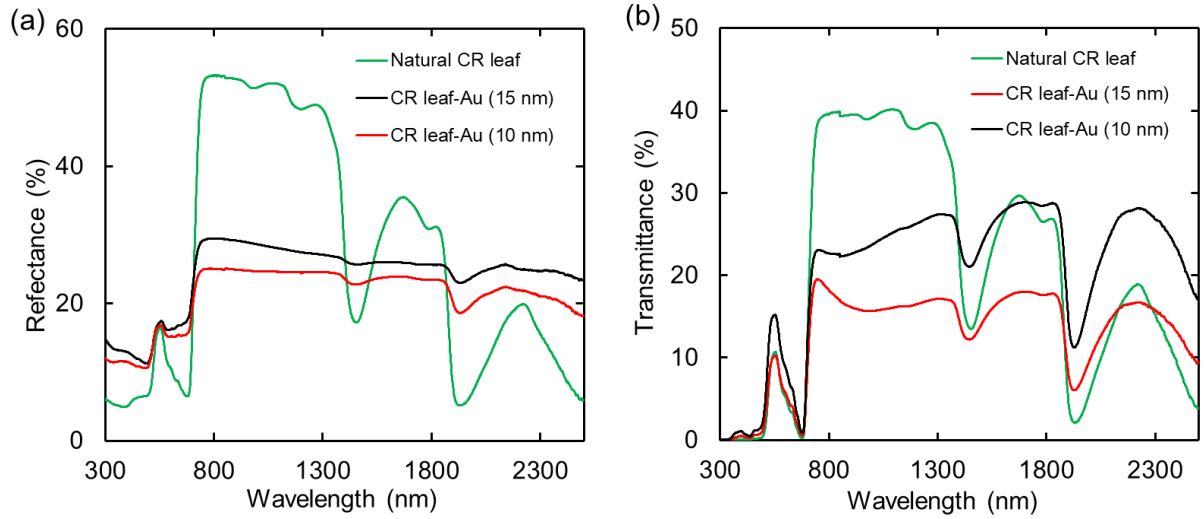

Figure S5. (a) Scattering reflection spectra of RC leaf, 10 and 15-nm-Au coated leaf, and (b) transmission of RC leaf, 10 and 15-nm-Au coated leaf.

S6. The light absorption spectra after 1 month fabrication

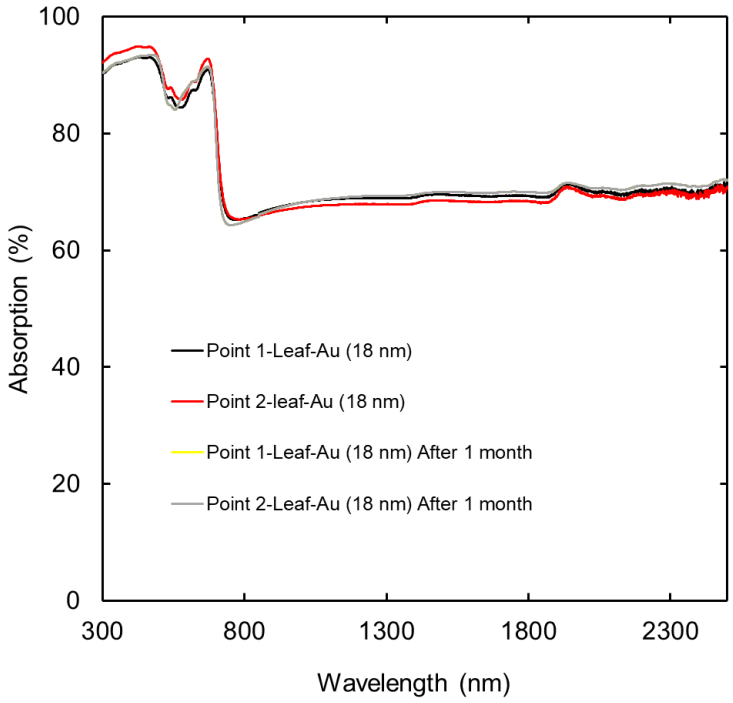

Figure S6: The light absorption spectra of 18 nm Au-coated *mulberry* leaves were measured at different locations on the sample immediately after fabrication and 1 month.

S7. Calculated absorption spectra

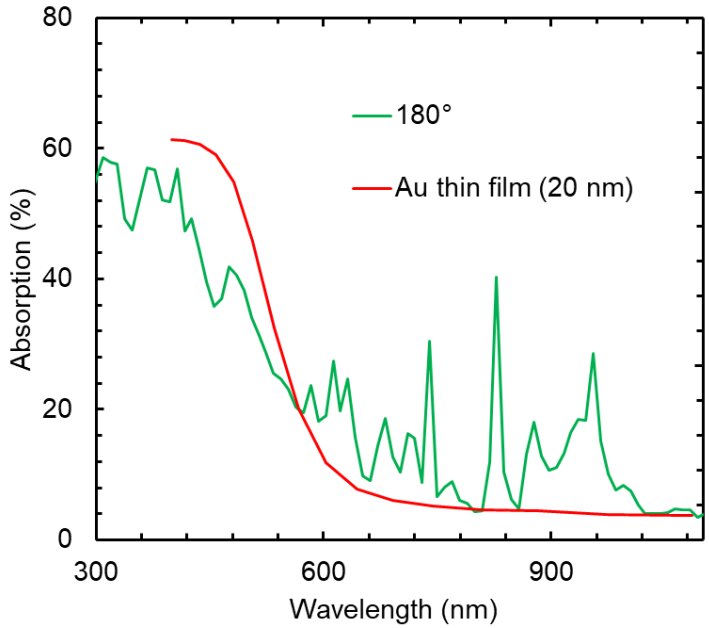

Figure S7. Calculated absorption spectra of the grating structure with uniaxial (α=180°) (blue line), 20 nm-Au thin film (red line).