Multifaceted Properties of TiO_2 Nanoparticles Synthesized via *Mangifera indica* and *Azadirachta indica* Plant Extracts: Antimicrobial, Antioxidant, and Non-linear Optical Investigations for Sustainable Agriculture Applications

Archana Rana[1,2], Saurabh Pathak[3], Kapil Kumar[1,2], Anjali Kumari[4,5], Samridhi Chopra[1,2], Mahesh Kumar[1,2], Deeba Kamil[5], Ritu Srivastava[1,2], Sang-Koog Kim[3], Rajni Verma[3,*], and Shailesh N. Sharma[1,2*]

[1] *CSIR-National Physical Laboratory, Dr. K.S. Krishnan Marg, New Delhi 110012, India*
[2] *Academy of Scientific and Innovative Research (AcSIR), Ghaziabad, 201002, India*
[3] *National Creative Research Initiative Center for Spin Dynamics and SW Devices, Nanospinics Laboratory, Research Institute of Advanced Materials, Department of Materials Science and Engineering, Seoul National University, Seoul 151-744, South Korea*
[4] *SHUATS- Sam Higginbottom University of Agriculture, Technology, and Sciences, Allahabad, Uttar Pradesh*
[5] *IARI-Indian Agricultural Research Institute, Pusa, New Delhi-110012*
Corresponding author's e-mail: rajni.verma@snu.ac.kr; shailesh@nplindia.org;

Supporting Information

Section S1: Brief description of chemical test to test the presence of following metabolites in both plant extracts such as *A. indica* and *M. indica*.

Test for flavonoids: In order to confirm the presence of flavonoids, 5 ml of NaOH (10%) solution was mixed with 2 ml of each plant extract individually (*A. indica* and *M. indica*), the mixture turns yellow colour, signifying the presence of flavonoids.

Test for steroids: 3 ml of plant extract and 3 ml of concentrated sulphuric acid with 3 ml of chloroform was mixed together, producing red colour in the bottom chloroform layer.

Test for terpenoids: Terpenoids are present, as evidenced by the reddish-brown color that results from mixing 5 ml of plant extract with 3 ml of chloroform and sulfuric acid.

Test for phenol: The presence of the phenol group is shown by adding a few drops of alcoholic $FeCl_3$ solution applied to 3 ml of leaf extract, which resulted in a bluish-black appearance.

Test for saponin: The formation of foam when the leaf extract and distilled water are rapidly agitated suggests the existence of saponins.

Test for protein: Nitric acid solution was added dropwise in 2 ml of leaf extract to generate dark yellow color indicating the presence of proteins.

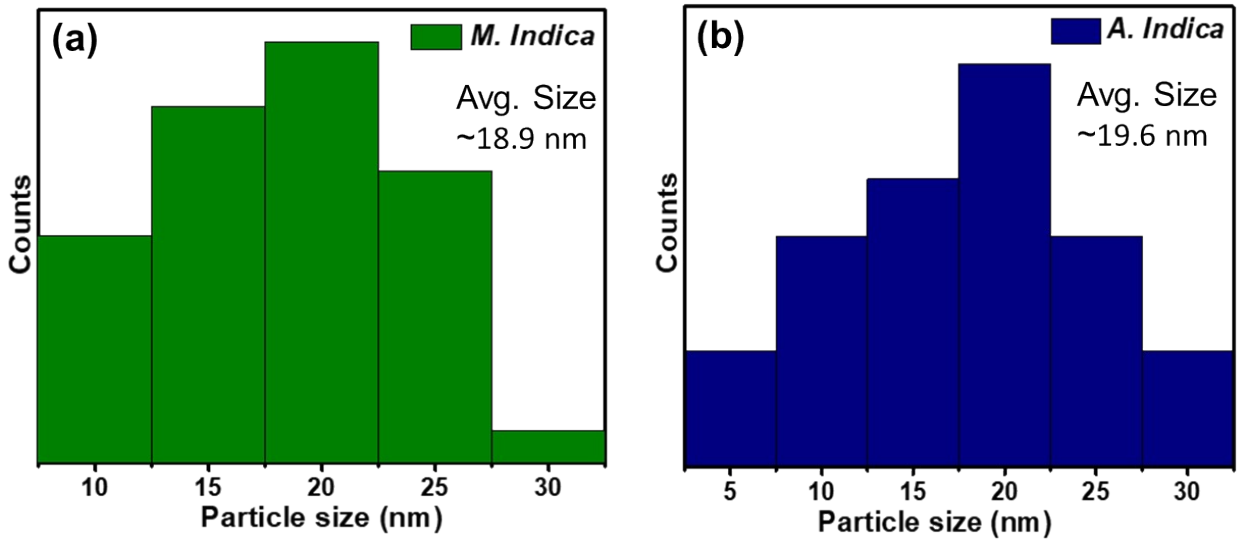

Figure S1: Particle size distribution of the TiO_2 NPs prepared using *M. indica* and *A. indica* plant extracts, respectively.

Table S1: EDX of TiO_2 NPs synthesized using *A. indica* and *M. indica.*

Element	***A. Indica* (Ti)**	***A. Indica* (O)**	***M. Indica* (Ti)**	***M. Indica* (O)**
Weight (%)	48.97	51.03	51.92	48.08
Atomic (%)	24.27	75.73	26.50	73.50