sunlight for 3.30 hours. By triplicating the experimental readings, it was determined, NPs synthesized using *Oxalis corniculata* stem extract at a concentration of 5 mg/mL exhibited the highest percentage degradation of 60% where mean absorbance of methylene blue was reduced from 1.430 to 0.5720. Synthesized zinc oxide NPs quenched the fluorescence of Rhodamine B dye at 591 nm with increasing concentration. Intensity of Rhodamine B dye of concentration $5 \times 10^{-4}$ mol/dm$^{-3}$ (4160 a.u), decreased with increasing NPs concentration from 50 μg/mL to 1000 μg/mL. The highest fluorescence quenching of 71% was shown by Zinc oxide NPs synthesized with extracts of Sauropus androgyus leaves where intensity of Rhodamine B dye was reduced from 4160 a.u. to 1194 a.u. Hence synthesis of zinc oxide nanoparticles using biological entities is a novel and potential alternative to chemically synthesized nanoparticles.

**Keywords:** ZnO NPs, fluorescence resonance energy transfer, photocatalytic, Green synthesis

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## Morphological and photocatalytic properties of zinc oxide nanoparticles synthesized from agricultural wastes of *Nephelium lappaceum* L. and *Garcinia mangostan* L.

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A facile, innovative and ecofriendly approach of biofabrication of zinc oxide nanoparticles (ZnO–NPs) using agricultural wastes (seed and peel) of N*ephelium lappaceum* L. and *Garcinia mangostana* L. have been demonstrated in this study. Characterizations of ZnO–NPs were carried out using Ultraviolet-Visible (UV–vis) spectrophotometry, Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), Energy Dispersive spectroscopy (EDX), and Fourier Transform Infrared spectroscopy (FTIR). The formation of ZnO-NPs was preliminary confirmed by the UV–vis spectroscopy, by the appearance of peaks between 362–368 nm. The SEM and TEM images show flower and rod-like arrangements of nanocrystals. As per the TEM images, all the synthesized ZnO-NPs showed the particle size ranging from 29-334 nm. FTIR spectral analysis demonstrated peaks at 3269–3500 cm$^{-1}$, 2308–2361 cm$^{-1}$, 2103–2110 cm$^{-1}$ and 1630–1640 cm$^{-1}$, 586–632 cm$^{-1}$ for the plant extracts, whereas an additional peak appeared within the range of 458–499 cm$^{-1}$ in synthesized ZnO–NPs. The degradation efficiency of ZnO–NPs was measured by the study of photo degradation of Methylene Blue and the results of ZnO–NPs synthesized via seed extract of *N. lappaceum* demonstrated the highest activity among all the synthesized NPs with a half-life of 78 min with 97% degradation efficiency at 150 min time frame.

**Keywords:** ZnO-NPs, biofabrication, degradation