**ABSTRACT**

The green synthesis of Titanium and Ti- Cerium nanoparticle (Ti-CeNP) is a convenient rapid and eco-friendly method compared to traditional synthesis methods. The green plant extract was synthesized from Cissusquadrangularis (CQ).The TiO2 and Ti-Ce nanoparticles were examined by UV, XRD, and FTIR.SEM. The SEM analysis shows the size and shape moropology of TiO2 and Ti-Ce nanoparticles. The synthesized TiO2 and Ti-Ce nanoparticles were confirmed by UV in the range occur at 350 and 500 nm The maximum zone of inhibition was observed in the synthesized TiO2NPs against [Bacillus subtilis](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/bacillus-subtilis) (60 mm).The green synthesized TiO2 and Ti-Ce using Cissusquadrangularis plant extract exhibited strong antibacterial activity, sensing Pb2+ ion and photo catalytic degradation of methylene blue dye. The Cytotoxicity of titanium nanoparticles was studied in MCF-7 cell lines using MTT assay. The results shows that the nanoparticles exhibits good results can satisfy the requirement of industrial production bearing the advantage of low cost, reproducible and eco-friendly. The green synthesized TiO2NPs has potential for use in the treatment for medical applications.