***Eco-friendly synthesis of Zr nanoparticles by seed coat of E.officinalis their characterization and applications***

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**Abstract**

*E. officinalis* is also called *Phyllanthus emblica*, whose eatable organic products are broadly utilized in Indian Ayurvedic medication as well as non eatable also (Dharmananda *et al*., 2003). The ethanolic seed coat extract of plant were successfully synthesized by green synthesis. The primary characterization X- ray diffraction was confirmed the tetragonal crystal structure by JCPDS NO. **80-2155** and exists with 54.08 nm in size. There transition from the valence band to the conduction band from oxide species to zirconium cation (O-→Zr4+) was showed absorption at wavelength 325 nm in UV –Vis spectroscopy. The distinct peaks were observed at 3302, 2925.74, 2296.72, 2160, 2072, 2009, 1745.26, 1623.25, 1457.61, 1155.11, 504.09 cm-1. The stability of nanoparticles and average particle size were measured by zeta potential and DLS via the value of -12.96 and **286.5** nm respectively. These dispersed images were scaled by ImageJ software for the conformation of the average diameter of nanoparticles scaled of 1µm, was obtained 14.65 nm and their mean particle size by TEM was scaled of 0.2 µm, 5.1µm, and 100µm. The mean size (70 nm) was increased due to hydrodynamic overview of particles. The antimicrobial activity of nanoparticles was useful for various *in vitro* studies by many pathogenic strains.

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