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**Master Thesis Defense**

Entitled

*GREEN SYNTHESIS, CHARACTERIZATION, ANTIOXIDANT AND ANTICANCER ACTIVITIES OF  
SILVER NANOPARTICLE USING Moringa peregrina LEAF EXTRACT*

by

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Online through BlackBoard Collaborate Ultra

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ABSTRACT

The sustainable green synthesis process for the development of environment-friendly, toxic free and biocompatible nanoparticles establishes important aspects in nanotechnology research. Even though, nanoparticles can be produced by either conventional physical and chemical or green synthesis, synthesizing nanoparticles using plant extracts as reducing and capping agents is acceptable. The benefits of plant extract mediated synthesis of silver nanoparticle comprise economic viability, quick synthesis, toxicity free, cost effective and large scale synthesis. In that way, the aqueous extract of *Moringa peregrina* leaves was used to synthesis silver nanoparticle. The silver nanoparticles were characterized by various spectral studies such as FT-IR, SEM, HR-TEM and XRD. The silver nanoparticles were studied for antioxidant activity viz. DPPH, ABTS, Hydroxyl radical scavenging, Superoxide radicals scavenging, nitric oxide scavenging potential and reducing power with varied concentrations level. The silver nanoparticles showed good antioxidant activity compared with ascorbic acid. The anticancer potential of the nanoparticle was studied against MCF-7 (Breast cancer cells) and Caco2 (colorectal cancer cells). The results revealed that the nanoparticles showed good toxicity of the studied cancer cell lines with the IC<sub>50</sub> values of 41.59 (Caco2) 26.93 (MCF-7) µg/ml. The results were compared with the standard Doxorubicin. In conclusion, the biosynthesized nanoparticle using *M. peregrina* as a reducing agent showed good antioxidant and anticancer potential on human cancer cells and it can be used in biological applications. However, more studies on surface modification and of AgNPs during biosynthesis and signaling mechanism behind the action are warranted for better understanding of its bioactivity. Moreover the cytotoxicity against normal cells is also need to be analysed.

**Keywords:** Silver nanoparticles, *Moringa peregrina*, anticancer, antioxidant activity