

Green Synthesis of Silver Nanoparticles with Aqueous Extract of *Moringa oleifera* Lam Leaves and Its Ameliorative Effect on Benign Prostatic Hyperplasia in Wistar Rat

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Abstract : The aim of this study was to perform green synthesis of silver nanoparticles (AgNPs) with the aqueous extract of *Moringa oleifera* Lam (M oleifera) leaves and determine its effects on benign prostatic hyperplasia in Wistar rats. Silver nitrate (AgNO₃) solution was reduced using the aqueous extract of *Moringa oleifera* Lam leaves, the resultant biogenic AgNPs were characterized by Fourier transformed infrared spectrophotometric, SEM, TEM and X-ray diffraction analysis. Animal experiments involved thirty (30) adult male Wistar rats randomly divided into five groups (A to E; n = 5). Group A received only subcutaneous injection of olive oil daily while the other groups got 3 mg/kg/daily of testosterone propionate (TP) subcutaneously plus 50 mg/kg/daily of AgNPs intraperitoneally (B), 3 mg/kg/daily of TP plus 25 mg/kg/daily of AgNPs (C), 3 mg/kg/daily of TP only (D) and 25 mg/kg/daily of AgNPs only (E). The animals were sacrificed after 14 days, and the prostate gland, liver, and kidney were processed for histological analysis. Phytochemical screening and GC-MS analysis were performed to determine the composition of the M oleifera extract used. Biogenic AgNPs with an average diameter of 23 nm were synthesized. Biogenic AgNPs ameliorated hormone-induced prostate enlargement, and the inhibition of prostatic hypertrophy could be due to the presence of a significant amount of plant fatty acids and phytosterols in the aqueous extract of M oleifera extract. However, the administration of biogenic AgNPs at higher doses impacted negatively on the cytoarchitecture of the liver. Green synthesis of AgNPs with the aqueous extract of *Moringa oleifera* might be beneficial for the treatment of BPH.

Keywords : benign prostatic hyperplasia, biogenic synthesis, *Moringa oleifera*, silver nanoparticles, testosterone

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