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# 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 ($AgNO_3$) 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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