

## **Phyto-Fabricated Selenium Nanoparticles from *Corchorus Olitorius* Leaf Extract: Antioxidant and Antibacterial Properties**

**Ogunleye Gbemisola Elizabeth<sup>1\*</sup>, Oyinlola Kubrat Abiola<sup>2</sup>, Akintade Oluwarotimi Olutosin<sup>3</sup>, Olatoye Motunrayo Janet<sup>1</sup>, Oyelere Ayanfeoluwa<sup>1</sup> Fashogbon Racheal Oluwayemisi<sup>4</sup>**

<sup>1</sup>Department of Biological Sciences, KolaDaisi University, Ibadan, Nigeria

<sup>2</sup>Department of Microbiology, University of Ibadan, Nigeria

<sup>3</sup>Department of Chemical Sciences, KolaDaisi University, Ibadan, Nigeria

<sup>4</sup>Department of Microbiology, Ajayi Crowther University, Nigeria

\*Corresponding author: [geegbemz@gmail.com](mailto:geegbemz@gmail.com)

### **Abstract**

*Corchorus olitorius* is a vegetable that is highly medicinal, rich in antioxidant properties and can be used for the synthesis of nanoparticles. Selenium is essential in the diet of humans, mammals and every other forms of life. This study is aimed at investigating the potential of *C. olitorius* for the synthesis of selenium nanoparticles (SeNPs) and their antioxidant and antibacterial activities. Selenium nanoparticles was phytosynthesized using *C. olitorius* leaf extract and characterized using UV-Visible spectroscopy, Scanning Electron Microscope, Transmission Electron Microscope, X-ray diffraction (XRD), Energy dispersive X-ray (EDX) and Fourier Transform Infra-red spectroscopy. Antioxidant activity of synthesized Selenium nanoparticles was done using (DPPH). Agar well diffusion method was used for the antimicrobial assay. Synthesis of SeNPs using *C. olitorius* (CO-SeNPs) was characterized by a strong plasmon resonance peak at 350 nm and had a broad band between 250 - 450 nm. The CO-SeNPs were spherical in shape with uniform sizes ranging from 50 – 100 nm. EDX analysis shows that selenium has the strongest signal and potassium was the weakest. Sharp peaks were observed in the XRD analysis indicating the formation of crystalline SeNPs. Hydroxyl, amine, thiol, and alkene were present which may be responsible for the efficient stabilization and bioreduction of SeNPs. The CO-SeNPs exhibited potent antioxidant activity ranging from 20.28% at 50ug/ml to 66.53% at 250ug/ml. Antimicrobial activity of CO-SeNPs ranged from 14±0.45 - 23±0.56 mm. Pyhto- synthesis of selenium nanoparticles from *C. olitorius* is a promising method in the biomedical field, due to its high bioactive components.

**Key Words:** Medicinal plant, Selenium nanoparticles, *Corchorus olitorius*, Antioxidant activities, Phytosynthesis