

Nano-remediation of Hormonal Endocrine Disrupting Chemicals from Water by *Acalypha Indica* Silver Nanoparticles

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Received date: September 06, 2021; Accepted date: September 20, 2021; Published date: September 27, 2021

Citation: Yakubu MA, Gonnabathula PK (2021) Nano-remediation of Hormonal Endocrine Disrupting Chemicals from Water by *Acalypha Indica* Silver Nanoparticles. J Bioremediat Biodegrad 12: 489.

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Abstract

Endocrine disrupting chemicals are natural or synthetic hormones and can be derived from plastics and pharmaceuticals. They have been found in trace amounts (ppt to ppb) in our water supplies and treated wastewater. They are therefore difficult to remove. We have synthesized silver nanoparticles (AgNP's) using *Acalypha indica* (A. indica) leaf extracts and used it to treat water samples spiked with hormones to determine efficiency of removal. AgNP's were synthesized and characterized by UV-Vis spectrophotometer, Zetasizer for particle size and zeta potential. To investigate the effects of the AgNP's on the removal of hormonal compounds from water, deionized

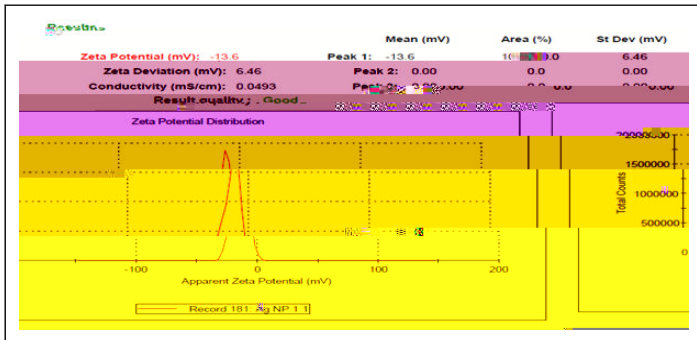


Figure 3: Zeta potential of AgNP's of *A. indica*.

UV-vis spectroscopy is commonly used to confirm metallic nanoparticle formation by studying the optical properties which depend particularly on size effect. Basically, the silver nanoparticles exhibit yellowish brown color in aqueous solution due to excitation of

Conclusion

In this study we have successfully synthesized AgNP's conjugate to *A. indica* using green synthesis method. Characterization confirms the synthesis and conjugation to *A. indica* shows a stable compound with potential for the use in possible remediation as our results shows that treatment of water samples spiked with hormones resulted in significant reduction in the peak area (The size of the peak is proportional to the concentration of the analyte). Our results suggest a potential for the use of AgNP's of *A. indica* in possible remediation to remove low concentration of hormones and other chemicals from the contaminant environment. However, this need further studies using samples from wastewater treatment plants for example.

Acknowledgment

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