Proceedings International
Platinum Open Access Journal (ISSN 2668-6384)

Proceedings, Abstract
Volume 2, Issue 1, 2020, 93
https://doi.org/10.33263/Proceedings21.093093

Green Synthesis of Reduced Graphene Nanosheets Using Leaf Extract of *Tridax procumbens* and its Potential *In-Vitro* Biological Activities †

Nathiya T. [1], Sivakumar A. [1,*], Aranganathan L. [2], Tamil Venthan M. [3]

[1] School of Bio-Sciences and Technology, Vellore Institute of Technology, Vellore 632 014, Tamil Nadu
[2] Research scholar, Sathyabama Institute of Science and Technology, Chennai 600 119, Tamil Nadu
[3] Research Associate, Adiuvo diagnostics Pvt. Ltd, Sipcot It park, Siruseri, Chennai 603 103, Tamil Nadu
* Correspondence: siva_kumar.a@vit.ac.in;
† Presented at International e-Conference on Bioengineering for Health and Environment (ICBHE 2020)
Received: 5.07.2020; Revised: 10.07.2020; Accepted: 12.07.2020; Published: 15.07.2020

Abstract: Graphene oxide nanoparticles has found immense application in bio therapeutics owing to its biocompatibility and enhanced effectiveness in drug delivery. The present study investigates the green synthesis of reduced graphene oxide using leaf extract using *Tridax procumbens* and testing its *in-vitro* biological activities. The biosynthesized reduced graphene oxide (rGO) was characterized by various spectroscopic and microscopic techniques. UV-vis spectroscopic analysis primarily detected the shift in the absorption peak from 232 to 287 nm confirming the reduction of TP-rGO. FTIR spectra of TP-rGO confirmed effective deoxygenation of GO assisted by bioactive molecules present in the leaf extract. Raman spectroscopic analysis identified successful reduction of GO through the presence of D band at 1329 cm^{-1} and G band at 1577 cm^{-1}. XRD spectra of TP-rGO showed diffraction peak 2θ at 25° confirming the presence of reduced GO. SEM analysis revealed the presence of graphene nanosheets appearing as large aggregated structure. The bioreduced rGO showed anti-oxidant effect against DPPH radical observed in concentration dependent manner. The TP-rGO nanosheets exhibited bactericidal effect against gram positive bacteria: *B.subitils* (18 mm) and *S. epidermis* (9 mm) and gram negative bacteria: *E.coli* (14 mm) and *P. aeruginosa* (6 mm) at 100 µg/ml confirming the enhanced anti-bacterial effects of TP-rGO against gram positive pathogens. Hence, it is highlighted that leaf extract of *Tridax procumbens* act as green reducing agent for the successful biosynthesis of rGO nanosheets demonstrating potential *in-vitro* biological activities and has great scope in the preparation of nano drugs for the treatment of various diseases.

Keywords: Green synthesis; *Tridax procumbens*; reduced graphene oxide; anti-oxidant effect; antibacterial activity.

Funding

This research received no external funding.

Acknowledgments

This research has no acknowledgment.

Conflicts of Interest

The authors declare no conflict of interest.