

OPE1) The physicochemical, Photocatalytic, and Biological Properties of Silver Nanoparticles conjugated *Cudrania Tricuspidata*

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1. 서론

Silver nanoparticles (SNPs) have been shown to possess potential biological properties, such as antibacterial, antioxidant, antitumor, and anti-inflammatory activities. Over the past decade, rapid-green synthesis approaches and methods for producing SNPs have been an interesting area in “green” nanotechnologies. Currently, SNP-mediated biogenic sources that are chosen to substitute toxic chemical methods have shown great potential in reducing polluting reaction by-products. The “green” nanotechnologies are advantageous over physical and chemical methods and exploit economical and ecofriendly methods by using an available and non-toxic medium such as medicinal plants that leads to the green synthesis of SNPs. The application of medicinal plants in the formation of SNPs has prompted numerous investigations in the field of “green” nanotechnologies. Compared to other biogenic sources including bacteria and fungi, medicinal plants appear to be more facilitative and faster, which significantly increases the productivity of this green-synthetic approach.

2. 재료 및 방법

We quantified the total phenol and flavonoid contents, reducing capacity, and antioxidant activity of all four extracts. The facile and optimum synthesis of CT-SNPs was visualized using UV-vis spectra. Surface morphology and crystallinity of CT-SNPs were assessed using UV-Vis spectra analysis, DLS, HR-TEM, EDS, XRD, and FT-IR. The photocatalytic capabilities of MT-GNPs were evaluated by measuring the reduction of methylene blue and rhodamine B.

3. 결과 및 고찰

In this study comprehensively applied, compared, and analyzed the composite extracts of CT on SNPs and performed multiplex assessment of their physicochemical, photocatalytic, and biological properties. To study the powerful antioxidant and reducing capacity of CT extracts, we investigated the total phenol and flavonoid content and reducing power and performed free radical ABTS and DPPH scavenging assays. The physicochemical examination of CT-SNPs was performed by UV-Vis spectra analysis, DLS, HR-TEM, EDS, XRD, and FT-IR. UV-Vis spectra analysis was performed to evaluate the photocatalytic degradation of methylene blue, methyl orange, rhodamine B, and Reactive Black 5. The biological properties were evaluated to prove antibacterial activity against gram-positive and gram-negative bacteria, as well as antiapoptosis against human hepatocellular carcinoma cells.

4. 참고문헌

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