

Enhanced antioxidant activity of gold and silver nanoparticles of Scopoletin isolated from *Sophora mollis*

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Abstract

This study aimed to increase the antioxidant potential of Scopoletin by utilizing green synthesis to create gold and silver nanoparticles. Pure Scopoletin was obtained from the aerial parts of *S. mollis* and identified using spectroscopic techniques. The synthesized AuNPs and AgNPs were characterized using UV-visible spectroscopy, FT-IR spectroscopy, and scanning electron microscopy (SEM). The results indicated that the gold nanoparticles had diameters ranging from 58 to 81 nm, while the silver nanoparticles were spherical in shape with diameters ranging from 75 to 89 nm. The radical scavenging capacity of Scopoletin, AuNPs, and AgNPs was evaluated using the DPPH method. The highest radical scavenging capacity was exhibited by AgNPs, with a percentage inhibition of $76.114 \pm 0.030\%$ at a concentration of 400 $\mu\text{g/ml}$. In comparison, the highest radical scavenging capacity of AuNPs was $65.924 \pm 0.018\%$, while the native compound showed weak activity at $16.641 \pm 0.0955\%$ at the same concentration. The results demonstrated an improved radical scavenging capacity of AgNPs and AuNPs, with ratios five and four times higher, respectively, compared to pure Scopoletin at the same concentration level. These findings suggest potential biomedical applications for the synthesized nanoparticles.

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