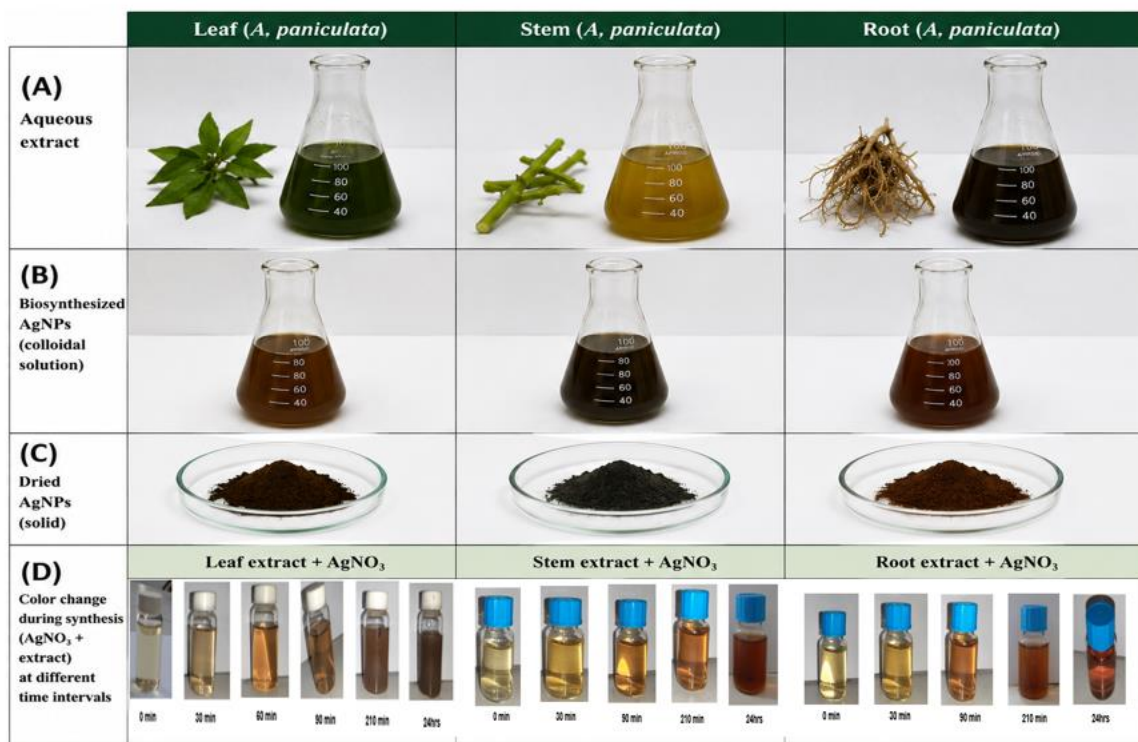


Supplementary Information

Comparative Study on Synthesis, Optimization and Physicochemical Characterization of Silver Nanoparticles Using Leaf, Stem and Root Extracts of *Andrographis paniculata*



Supplementary Figure S1. Visual observation of the green synthesis of silver nanoparticles using leaf, stem, and root extracts of *Andrographis paniculata*. (A) Fresh plant materials and their corresponding aqueous extracts; (B) colloidal AgNP suspensions after biosynthesis; (C) freeze-dried AgNP powders; and (D) time-dependent colour changes of the reaction mixtures following the addition of AgNO₃ solution, demonstrating the gradual formation of silver nanoparticles.

Supplementary Table S1: Qualitative phytochemical screening of aqueous leaf, stem and root extracts of *Andrographis paniculata*.

	Different parts of <i>A. paniculata</i>		
Tested Phytochemicals	leaf	Stem	Root
Terpenoids	+	+	+
Saponins	+	+	+
Tannins	-	-	-
Flavonoids	+	+	+
Alkaloids	+	+	+
Steroids	+	+	+
Carbohydrates	+	+	+

Supplementary Table S2. Major FTIR absorption bands and functional-group assignments for leaf-, stem- and root-mediated AgNPs.

Wavenumber (cm ⁻¹)	Functional group	Vibrational mode	Major phytochemicals	Proposed role in AgNP synthesis
3341–3352	O–H / N–H	Stretching	Flavonoids, phenolics, proteins	Reduction and capping
2916–2922	C–H	Stretching	Terpenoids, steroids	Surface stabilization
1625–1632	C=O / C=C	Stretching	Flavonoids, aromatic compounds	Reduction of Ag ⁺ ions
1379–1386	C–N / C–O	Stretching	Alkaloids, proteins	Surface stabilization
1106–1112	C–O	Stretching	Carbohydrates, saponins, glycosides	Capping and stabilization
815–822	C–H	Out-of-plane bending	Aromatic compounds	Structural stabilization