

Supplementary Material

Article

Green Synthesis and Antibacterial Activity of Silver Nanoparticles obtained from *Moringa oleifera* Seed Cake

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Table S1 – Seed cake composition.

Parameters	Quantity (per 100 g)
Total protein content	47.9 g
L-Alanine	1.6 g
L-Arginine	6.13 g
L-Aspartic acid	1.78 g
L-Glutamic acid	8.36 g
Glycine	2.08 g
L-Histidine	0.904 g
L-Isoleucine	1.25 g
L-Leucine	2.25 g
L-Lysine	0.56 g
L-Methionine	0.821 g
L-Phenylalanine	1.64 g
L-Proline	2.21 g
L-Serine	1.23 g
L-Threonine	1.0 g
L-Tyrosine	0.646 g
Valine	1.54 g
Total lipid content	17.1 g
Saturated fatty acids	3.5 g
Monounsaturated fatty acids	12.3 g
Polyunsaturated fatty acids	0.2 g
Ascorbic acid	10 mg
Tiamin	657 µg

Data provided by Naturinga – Sociedade de Comercialização de Produtos da Natureza, Lda. The seed cake composition is representative of the seed cake batch used for silver nanoparticle synthesis, obtained as a subproduct in the proprietary process of oil extraction by cold pressing the seeds of the plant.

Table S2 – Particle size estimation using DLS spectroscopy.

Sample	Seed cake quantity (g)	Particle Size (nm)	SD (nm)	PDI
AgNPs	5	ND		
	10	174	35	0.8
	15	201	36	0.6
	25	267	39	0.4
Synthesis control	10	ND		
Seed cake extract	10	ND		
AgNO ₃ (aq.)	–	ND		

The hydrodynamic diameter of particles was assessed by DLS spectroscopy for different samples and synthesis products. Seed cake quantity refers to the amount of seed cake used in extracts preparation (as described in section 2.1). Synthesis control refers to the final product of the reaction done accordingly with section 2.3 replacing the aqueous AgNO₃ by Milli-Q grade water. ND – not detected; SD – standard deviation; PDI – polydispersity.

Table S3 – Secondary structure estimation using FTIR data.

Wavenumber (cm ⁻¹)	Structure assignment	Fractional Area (%)
Synthesis control		
1612	β-sheet	16
1630	β-sheet	14
1639	Random coil	6
1648	α-helix	20
1658	α-helix	10
1670	β-sheet	34
AgNPs		
1611	β-sheet	9
1625	β-sheet	7
1638	Random coil	12
1649	α-helix	40
1661	α-helix	19
1675	β-sheet	13

FTIR data were obtained for AgNPs and control samples. In the case of the “Synthesis control” data was collected for the final product of the reaction done accordingly with section 2.3 replacing the aqueous AgNO₃ by Milli-Q grade water. Values were obtained by deconvolution of each FTIR spectrum in the 1700–1550 cm⁻¹ energy region. Spectral deconvolution was obtained after normalization to the total area of the amide I band, using a gaussian band-fitting model with six different species. The percent of the area is listed for each secondary structure element assignment. For further details see Chapter 7 in “B. Stuart. Infrared Spectroscopy: Fundamentals and Applications. 2004 John Wiley & Sons, Ltd ISBNs: 0-470-85427-8 (HB); 0-470-85428-6 (PB)”.