

Supporting Information for

Non-medicinal Parts of Safflower (Bud and Stem) Mediated Sustainable Green Synthesis of Silver Nanoparticles under Ultrasonic: Optimization, Characterization, Antioxidant, Antibacterial and Anticancer Potential

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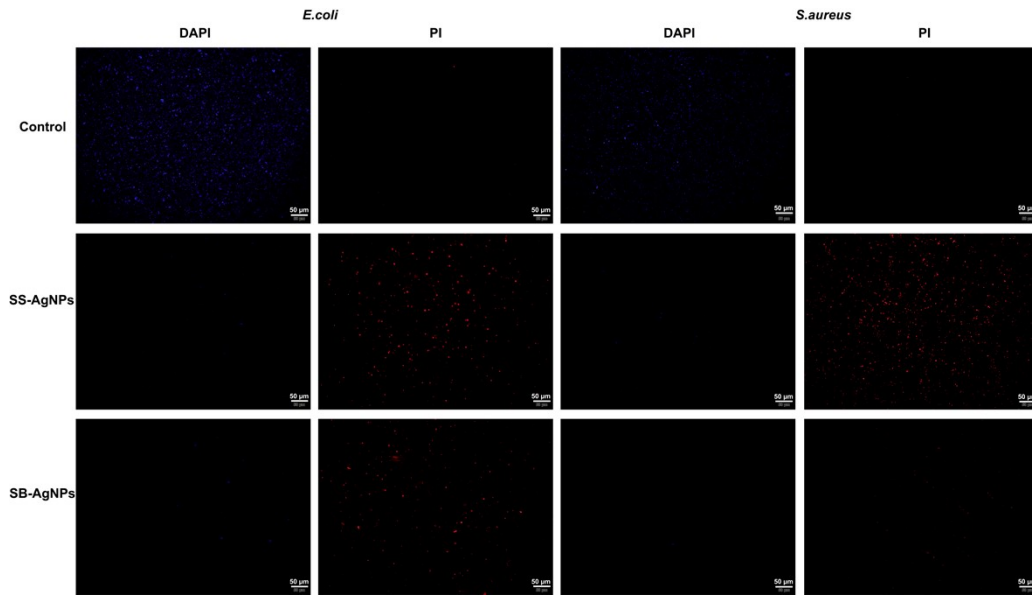


Figure S1 Fluorescence micrographs of *E. coli* and *S. aureus* after incubating with DAPI and PI.

Table S1 Average size of SS-AgNPs synthesized with different process parameters (5.0 mL SS extract and 5.0 mL 10 mM AgNO₃)

| Times (h) \ pH | Average size/nm | | | | | | |
|----------------|-----------------|----------|----------|----------|----------|----------|-----------|
| | 4.0 | 5.0 | 6.0 | 7.0 | 8.0 | 9.0 | 10.0 |
| 1.0 | - | - | - | 81.4±1.2 | 44.1±1.1 | 76.0±1.0 | 40.6±8.0 |
| 2.0 | - | - | - | 73.8±1.0 | 62.7±4.9 | 87.5±0.5 | 63.2±9.2 |
| 3.0 | 71.5±0.3 | 65.0±1.8 | 44.0±0.2 | 20.5±0.3 | 31.0±2.3 | 48.6±0.6 | 100.8±8.0 |
| 4.0 | 73.6±1.2 | 40.4±1.7 | 24.7±0.1 | 45.1±0.4 | 26.2±0.1 | 54.8±1.2 | 37.5±6.3 |
| 5.0 | 85.4±0.8 | 47.7±0.6 | 40.6±1.7 | 29.1±2.7 | 48.7±2.0 | 56.9±0.6 | 28.4±9.8 |
| 6.0 | 93.0±1.1 | 66.9±3.0 | 32.9±1.0 | 30.3±0.3 | 19.7±0.8 | 21.9±0.3 | 90.0±1.7 |

Table S2 Average size of SS-AgNPs synthesized with different material ratio (at pH 10.0 after incubation 4.0 h)

| Extract: AgNO ₃ | Average size/nm |
|----------------------------|-----------------|
| 1:1 | 48.2±1.2 |
| 1:2 | 34.3±1.3 |
| 1:3 | 90.3±0.6 |
| 1:4 | 93.3±0.1 |
| 1:5 | 92.4±1.0 |
| 1:10 | 106.8±1.3 |
| 1:20 | 125.2±0.9 |

Table S3 Average size of SB-AgNPs synthesized with different process parameters (5.0 mL SB extract and 5.0 mL 10 mM AgNO₃)

| Times (h) \ pH | Average size/nm | | | | | |
|----------------|-----------------|------------|------------|-----------|----------|----------|
| | 5.0 | 6.0 | 7.0 | 8.0 | 9.0 | 10.0 |
| 4.0 | - | - | - | - | 34.1±1.2 | 26.2±2.6 |
| 5.0 | - | - | - | - | 30.2±2.8 | 54.4±0.6 |
| 6.0 | - | - | - | - | 32.8±3.3 | 26.5±1.5 |
| 8.0 | 673.9±7.6 | 241.5±6.1 | 171.0±0.8 | 103.8±0.8 | 47.5±1.0 | 43.8±0.3 |
| 9.0 | 373.5±28.7 | 473.4±8.2 | 219.1±8.8 | 116.6±4.7 | 63.4±1.1 | 50.8±0.5 |
| 10.0 | 330.3±5.1 | 380.4±15.8 | 269.0±30.8 | 113.1±0.8 | 90.1±4.4 | 33.0±1.2 |
| 12.0 | 591.1±59.2 | 358.5±7.1 | 214.8±9.3 | 162.5±3.5 | 48.3±0.8 | 30.1±0.2 |

Table S4 Average size of SB-AgNPs synthesized with different material ratio (at pH 10.0 after incubation 6.0 h)

| Extract: AgNO ₃ | Average size/nm |
|----------------------------|-----------------|
| 1:1 | 23.5±0.3 |
| 1:2 | 165.4±2.2 |
| 1:3 | 153.3±2.7 |
| 1:4 | 132.3±3.7 |
| 1:5 | 140.7±0.7 |
| 1:10 | 98.7±0.1 |
| 1:20 | 83.0±0.6 |

Table S5 PDI of SS-AgNPs synthesized with different process parameters (5.0 mL SS extract and 5.0 mL 10 mM AgNO₃)

| Times (h) \ pH | Polydispersity index/PDI | | | | | | |
|----------------|--------------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| | 4.0 | 5.0 | 6.0 | 7.0 | 8.0 | 9.0 | 10.0 |
| 1.0 | - | - | - | 0.44±0.03 | 0.47±0.01 | 0.40±0.01 | 0.39±0.06 |
| 2.0 | - | - | - | 0.46±0.01 | 0.72±0.07 | 0.31±0.01 | 0.32±0.09 |
| 3.0 | 0.23±0.01 | 0.47±0.03 | 0.28±0.01 | 0.69±0.01 | 0.52±0.02 | 0.54±0.01 | 0.29±0.06 |
| 4.0 | 0.24±0.01 | 0.39±0.07 | 0.55±0.01 | 0.34±0.04 | 0.55±0.01 | 0.51±0.03 | 0.36±0.02 |
| 5.0 | 0.28±0.03 | 0.33±0.04 | 0.39±0.07 | 0.78±0.06 | 0.48±0.06 | 0.54±0.01 | 0.34±0.08 |
| 6.0 | 0.22±0.01 | 0.44±0.01 | 0.46±0.02 | 0.54±0.01 | 0.59±0.03 | 0.60±0.01 | 0.38±0.05 |

Table S6 PDI of SS-AgNPs synthesized with different material ratio (at pH 10.0 after incubation 4.0 h)

| Extract: AgNO ₃ | Polydispersity index/PDI |
|----------------------------|--------------------------|
| 1:1 | 0.39±0.05 |
| 1:2 | 0.39±0.06 |
| 1:3 | 0.26±0.01 |
| 1:4 | 0.29±0.04 |
| 1:5 | 0.27±0.01 |
| 1:10 | 0.24±0.01 |
| 1:20 | 0.20±0.02 |

Table S7 PDI of SB-AgNPs synthesized with different process parameters (5.0 mL SS extract and 5.0 mL 10 mM AgNO₃)

| pH \ Times (h) | Polydispersity index/PDI | | | | | |
|----------------|--------------------------|-----------|-----------|-----------|-----------|-----------|
| | 5.0 | 6.0 | 7.0 | 8.0 | 9.0 | 10.0 |
| 4.0 | - | - | - | - | 0.53±0.03 | 0.67±0.13 |
| 5.0 | - | - | - | - | 0.75±0.17 | 0.49±0.01 |
| 6.0 | - | - | - | - | 0.67±0.19 | 0.61±0.04 |
| 8.0 | 0.50±0.06 | 0.43±0.08 | 0.31±0.03 | 0.27±0.01 | 0.45±0.01 | 0.47±0.01 |
| 9.0 | 0.71±0.15 | 0.37±0.03 | 0.32±0.08 | 0.35±0.05 | 0.48±0.01 | 0.49±0.04 |
| 10.0 | 0.74±0.12 | 0.51±0.02 | 0.32±0.06 | 0.34±0.03 | 0.52±0.01 | 0.51±0.03 |
| 12.0 | 0.60±0.07 | 0.51±0.01 | 0.43±0.01 | 0.41±0.03 | 0.47±0.02 | 0.52±0.01 |

Table S8 PDI of SB-AgNPs synthesized with different material ratio (at pH 10.0 after incubation 6.0 h)

| Extract: AgNO ₃ | Polydispersity index/PDI |
|----------------------------|--------------------------|
| 1:1 | 0.82±0.01 |
| 1:2 | 0.29±0.02 |
| 1:3 | 0.21±0.01 |
| 1:4 | 0.21±0.02 |
| 1:5 | 0.25±0.01 |
| 1:10 | 0.18±0.01 |
| 1:20 | 0.34±0.06 |

Table S9 Zeta potential of SS-AgNPs and SB-AgNPs synthesized at different pH

| pH | Zeta potential/mV | |
|------|-------------------|------------------|
| | SS-AgNPs (5.0 h) | SB-AgNPs (8.0 h) |
| 4.0 | -19.7±0.3 | - |
| 5.0 | -17.6±1.3 | -23.6±1.3 |
| 6.0 | -17.6±1.3 | -26.9±0.7 |
| 7.0 | -17.8±0.9 | -31.4±3.5 |
| 8.0 | -18.5±1.5 | -35.2±3.3 |
| 9.0 | -18.6±0.9 | -34.9±4.1 |
| 10.0 | -29.7±1.2 | -34.2±2.0 |

Table S10 Zeta potential of SB-AgNPs synthesized with different material ratio (8.0 h)

| Extract: AgNO ₃ | Zeta potential/mV |
|----------------------------|-------------------|
| 1:1 | -22.3±1.2 |
| 1:2 | -20.7±0.4 |
| 1:3 | -23.0±1.0 |
| 1:4 | -22.0±1.0 |
| 1:5 | -24.0±0.2 |
| 1:10 | -22.0±0.3 |
| 1:20 | -19.0±0.8 |