

Supporting Information for

Gallic Acid Based Black Tea Extract as A Stabilizing Agent in ZnO Particles Green Synthesis

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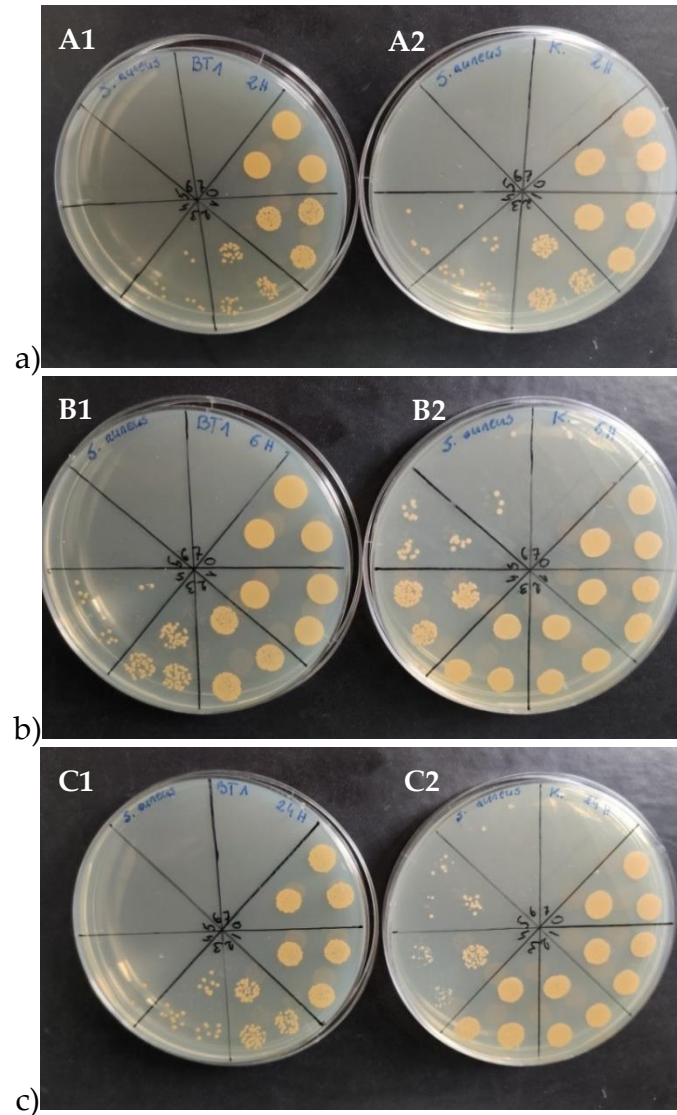


Figure S1. Images of TSA plates after culturing and incubation with *S. aureus* ATCC 6538 at 37°C for 24 hours: a) A1: plate after 2h of treatment BT1, A2: control plate, b) B1: plate after 6h of treatment BT1, B2: control plate, c) C1: plate after 24h of treatment BT1, C2: control plate.

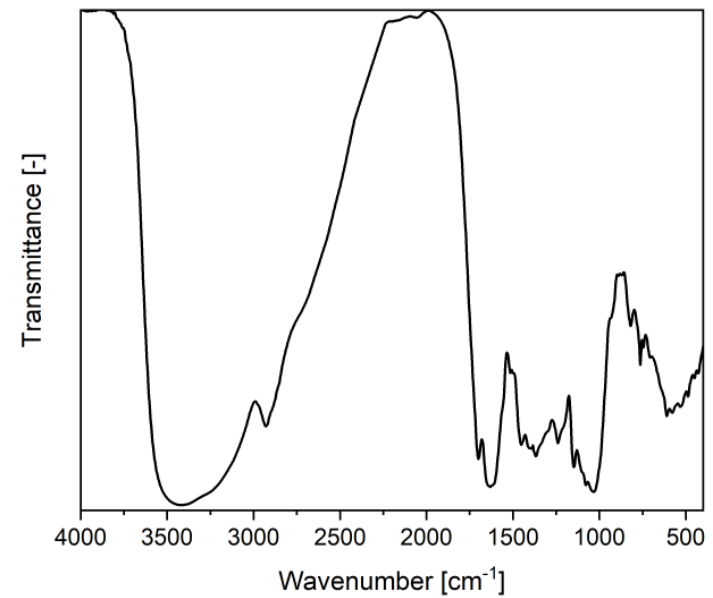


Figure S2. FTIR spectrum of black tea extract.

Table S1. Data obtained from LC-MS experiments.

Negative ion mode								
No .	m/z [measured]	Identification	Molecular formula of ion	m/z [theoretical]	Error [ppm]	Adduct (ion)	RT [min]	Molecular formula
1	191.0576	Quinic acid	C ₇ H ₁₁ O ₆	191.0561	8.0	[M-H] ⁻	1.0	C ₇ H ₁₂ O ₆
2	169.0146	Gallic acid	C ₇ H ₅ O ₅	169.0142	-2.2	[M-H] ⁻	1.4	C ₇ H ₆ O ₅
3	353.0875	Chlorogenic / Neochlorogenic acid	C ₁₆ H ₁₇ O ₉	353.0878	-0.9	[M-H] ⁻	7.0	C ₁₆ H ₁₈ O ₉
4	761.1361	Theasinesin B / Prodelphinidin- <i>O</i> -gallate	C ₃₇ H ₂₉ O ₁₈	761.1359	-0.2	[M-H] ⁻	7.2	C ₃₇ H ₃₀ O ₁₈
5	305.0668	Gallocatechin / Epigallocatechin	C ₁₅ H ₁₃ O ₇	305.0667	0.4	[M-H] ⁻	7.4	C ₁₅ H ₁₄ O ₇
6	337.0928	<i>p</i> -Coumaroylquinic acid (isomer I)	C ₁₆ H ₁₇ O ₈	337.0929	-0.3	[M-H] ⁻	7.6	C ₁₆ H ₁₈ O ₈
7	337.0926	<i>p</i> -Coumaroylquinic acid (isomer II)	C ₁₆ H ₁₇ O ₈	337.0929	0.9	[M-H] ⁻	8.2	C ₁₆ H ₁₈ O ₈
8	337.0928	<i>p</i> -Coumaroylquinic acid (isomer III)	C ₁₆ H ₁₇ O ₈	337.0929	-0.3	[M-H] ⁻	8.6	C ₁₆ H ₁₈ O ₈
9	289.0719	Catechin	C ₁₅ H ₁₃ O ₆	289.0718	0.3	[M-H] ⁻	7.7	C ₁₅ H ₁₄ O ₆
10	289.0717	Epicatechin	C ₁₅ H ₁₃ O ₆	289.0718	-0.3	[M-H] ⁻	8.2	C ₁₅ H ₁₄ O ₆
11	595.1665	Eriocitrin	C ₂₇ H ₃₁ O ₁₅	595.1668	-0.5	[M-H] ⁻	7.7	C ₂₇ H ₃₂ O ₁₅
12	353.0878	Chlorogenic / Neochlorogenic acid	C ₁₆ H ₁₇ O ₉	353.0878	-0.1	[M-H] ⁻	7.8	C ₁₆ H ₁₈ O ₉
13	593.1515	Epicatechin digallate / Kaempferol rutinoside / Kaempferol galactosyl rhamnoside / unknown conjugate	C ₂₇ H ₂₉ O ₁₅	593.1512	-0.4	[M-H] ⁻	8.0	C ₂₇ H ₃₀ O ₁₅
14	593.1512	Epicatechin digallate / Kaempferol rutinoside / Kaempferol galactosyl rhamnoside / unknown conjugate	C ₂₇ H ₂₉ O ₁₅	593.1512	0	[M-H] ⁻	8.6	C ₂₇ H ₃₀ O ₁₅
15	593.1514	Epicatechin digallate / Kaempferol rutinoside / Kaempferol galactosyl rhamnoside / unknown conjugate	C ₂₇ H ₂₉ O ₁₅	593.1512	0.3	[M-H] ⁻	9.2	C ₂₇ H ₃₀ O ₁₅
16	593.1511	Epicatechin digallate / Kaempferol rutinoside / Kaempferol galactosyl rhamnoside / unknown conjugate	C ₂₇ H ₂₉ O ₁₅	593.1512	-0.2	[M-H] ⁻	9.4	C ₂₇ H ₃₀ O ₁₅
17	563.1405	Catechin/Epicatechin glycoconjugate	C ₂₆ H ₂₇ O ₁₄	563.1406	-0.2	[M-H] ⁻	8.4	C ₂₆ H ₂₈ O ₁₄
18	479.0832	Myricetin-3- <i>O</i> -galactoside/glucoside	C ₂₁ H ₁₉ O ₁₃	479.0831	0.3	[M-H] ⁻	8.6	C ₂₁ H ₂₀ O ₁₃
19	771.1991	Quercetin based triglycoside	C ₃₃ H ₃₉ O ₂₁	771.1989	-0.3	[M-H] ⁻	8.6	C ₃₃ H ₄₀ O ₂₁
20	755.2040	Quercetin based triglycoside (deoxyhexose-hexose-deoxyhexose)	C ₃₃ H ₃₉ O ₂₀	755.2040	0	[M-H] ⁻	8.8	C ₃₃ H ₄₀ O ₂₀
21	755.2046	Kaempferol based triglycoside	C ₃₃ H ₃₉ O ₂₀	755.2040	0.8	[M-H] ⁻	9.0	C ₃₃ H ₄₀ O ₂₀
22	273.0767	Afzelechin / Epiafzelechin	C ₁₅ H ₁₃ O ₅	273.0768	-0.4	[M-H] ⁻	8.8	C ₁₅ H ₁₄ O ₅
23	609.1459	Quercetin diglycoside (hexose-deoxyhexose)	C ₂₇ H ₂₉ O ₁₆	609.1461	-0.3	[M-H] ⁻	8.9	C ₂₇ H ₃₀ O ₁₆
24	739.2090	Kaempferol triglycoside (deoxyhexose-hexose-deoxyhexose)	C ₃₃ H ₃₉ O ₁₉	739.2091	0.1	[M-H] ⁻	9.0	C ₃₃ H ₄₀ O ₁₉
25	431.0981	Vitexin / Isovitexin	C ₂₁ H ₁₉ O ₁₀	431.0984	-0.6	[M-H] ⁻	9.0	C ₂₁ H ₂₀ O ₁₀

26	441.0827	Epicatechin/Catechin gallate	C ₂₂ H ₁₇ O ₁₀	441.0827	0.1	[M-H] ⁻	9.2	C ₂₂ H ₁₈ O ₁₀
27	463.0878	Quercetin hexoside	C ₂₁ H ₁₉ O ₁₂	463.0882	0.8	[M-H] ⁻	9.2	C ₂₁ H ₂₀ O ₁₂
28	447.0931	Kaempferol hexoside	C ₂₁ H ₁₉ O ₁₁	447.0933	0.3	[M-H] ⁻	9.5	C ₂₁ H ₂₀ O ₁₁
29	447.0928	Kaempferol hexoside	C ₂₁ H ₁₉ O ₁₁	447.0933	-1.1	[M-H] ⁻	9.7	C ₂₁ H ₂₀ O ₁₁
30	516.1371	Quercetin based glycoconjugate	C ₄₇ H ₅₂ O ₂₆	516.1379	-1.6	[M-2H] ²⁻	10.5	C ₄₇ H ₅₄ O ₂₆
31	1033.2831	Quercetin based glycoconjugate	C ₄₇ H ₅₃ O ₂₆	1033.2831	-0.1	[M-H] ⁻	10.5	C ₄₇ H ₅₄ O ₂₆
32	450.1161	Quercetin based acylated triglycosiede	C ₄₂ H ₄₄ O ₂₂	450.1168	1.6	[M-2H] ²⁻	10.7	C ₄₂ H ₄₆ O ₂₂
33	901.2405	Quercetin based acylated triglycosiede	C ₄₂ H ₄₅ O ₂₂	901.2408	0.4	[M-H] ⁻	10.7	C ₄₂ H ₄₆ O ₂₂
34	442.1184	Catechin/Epicatechin based glycoconjugate	C ₄₂ H ₄₄ O ₂₁	442.1193	-2.1	[M-2H] ²⁻	11.0	C ₄₂ H ₄₆ O ₂₁
35	885.2453	Catechin/Epicatechin based glycoconjugate	C ₄₂ H ₄₅ O ₂₁	885.2459	-0.7	[M-H] ⁻	11.0	C ₄₂ H ₄₆ O ₂₁
36	715.1301	Theaflavin gallate	C ₃₆ H ₂₇ O ₁₆	715.1305	0.5	[M-H] ⁻	11.5	C ₃₆ H ₂₈ O ₁₆
37	715.1304	Theaflavin gallate	C ₃₆ H ₂₇ O ₁₆	715.1305	-0.1	[M-H] ⁻	11.7	C ₃₆ H ₂₈ O ₁₆
38	301.0351	Quercetin	C ₁₅ H ₉ O ₇	301.0354	1.0	[M-H] ⁻	11.9	C ₁₅ H ₁₀ O ₇
39	867.1432	Theaflavin digallate	C ₄₃ H ₃₁ O ₂₀	867.1414	-2.1	[M-H] ⁻	12.1	C ₄₃ H ₃₂ O ₂₀
40	285.0404	Kaempferol	C ₁₅ H ₉ O ₆	285.0405	0.3	[M-H] ⁻	13.4	C ₁₅ H ₁₀ O ₆
41	227.1286	dihydroxycarboxylic / dicarboxylic acid or esther	C ₁₂ H ₁₉ O ₄	227.1289	1.2	[M-H] ⁻	15.7	C ₁₂ H ₂₀ O ₄
42	227.1288	Acetylated hydroxycarboxylic acid	C ₁₂ H ₁₉ O ₄	227.1289	-0.2	[M-H] ⁻	16.0	C ₁₂ H ₂₀ O ₄
43	293.1759	Unknown carboxylic acid or esther	C ₁₇ H ₂₅ O ₄	293.1758	-0.4	[M-H] ⁻	16.4	C ₁₇ H ₂₆ O ₄
44	563.1192	Theaflavin	C ₂₉ H ₂₃ O ₁₂	563.1195	0.6	[M-H] ⁻	11.2	C ₂₉ H ₂₄ O ₁₂
Positive ion mode								
No	m/z [measured]	Identification	Molecular formula of ion	m/z [theoretical]	Error [ppm]	Adduct (ion)	RT [min]	Molecular formula
1	175.1083	Theanine	C ₇ H ₁₅ N ₂ O ₃	175.1077	3.4	[M+H] ⁺	1.0	C ₇ H ₁₄ N ₂ O ₃
2	195.0886	Caffeine	C ₈ H ₁₁ N ₄ O ₂	195.0877	4.8	[M+H] ⁺	7.7	C ₈ H ₁₀ N ₄ O ₂
3	130.0864	Cycloleucine	C ₆ H ₁₂ NO ₂	130.0863	1.0	[M+H] ⁺	1.3	C ₆ H ₁₁ NO ₂
4	166.0865	Phenylalanine	C ₉ H ₁₂ NO ₂	166.0863	-1.5	[M+H] ⁺	1.3	C ₉ H ₁₁ NO ₂