

SUPPLEMENTARY MATERIAL TO
**Allelopathic effects and insecticidal activity of aqueous extracts
of *Satureja montana* L.**

JOVANA ŠUČUR^{1*}, ALEKSANDRA POPOVIĆ¹, MILOŠ PETROVIĆ¹, GORAN ANAČKOV², VOJISLAVA BURSIĆ¹, BILJANA KIPROVSKI¹ and DEJAN PRVULOVIĆ¹

¹Faculty of Agriculture, University of Novi Sad, Trg Dositeja Obradovića 8, 21000 Novi Sad, Serbia and ²Faculty of Science, University of Novi Sad, Trg Dositeja Obradovića 3, 21000 Novi Sad, Serbia

J. Serb. Chem. Soc. 80 (4) (2015) 475–484

RESULTS OF THE HPLC-DAD ANALYSIS OF THE INVESTIGATED PHENOLIC
COMPOUNDS

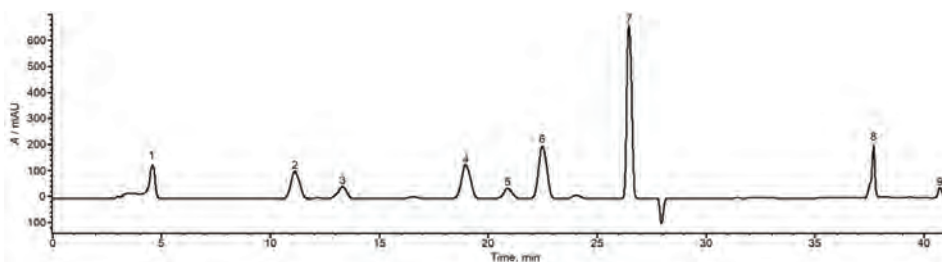


Fig. 1. HPLC-DAD chromatogram of phenolic compounds, 1 – gallic acid; 2 – chlorogenic acid; 3 – caffeic acid; 4 – *p*-coumaric acid; 5 – ferulic acid; 6 – 2-hydroxy cinnamic acid; 7 – *trans*-cinnamic acid; 8 – kaempferol; 9 – quercetin.

* Corresponding author. E-mail: jovanasucur@yahoo.com
doi: 10.2298/JSC020714106S

TABLE S-I. Retention time, linearity (R^2) and repeatability (RSD) for the investigated phenolic compounds

Phenolic acid	Retention time, min	R^2	RSD / %
Gallic acid	4.58	0.9998	6.76
Ferulic acid	22.48	0.9966	2.42
2-Hydroxy cinnamic acid	24.00	0.9967	9.61
<i>trans</i> -Cinnamic acid	26.43	0.9949	5.09
Caffeic acid	13.29	0.9984	9.48
<i>p</i> -Coumaric acid	18.94	0.9985	2.74
Chlorogenic acid	11.21	0.9996	4.18
Kaempferol	37.67	0.9996	11.93
Quercetin	40.75	0.9992	7.25

EFFECT OF THE AQUEOUS EXTRACTS OF *Satureja montana* ON THE ANTI-OXIDANT ENZYMES AND LIPID PEROXIDATION IN THE ROOTS AND LEAVES OF BLACK NIGHTSHADE AND PEPPER SEEDLINGS

TABLE S-II. Effect of two concentrations of *S. montana* aqueous extracts on the activities of CAT, SOD, GPX and PPX and on the MDA content in the roots of black nightshade seedlings; the data are mean values \pm SE; a–f values without the same superscripts within each column differ significantly ($P < 0.05$); CAT, catalase; SOD, superoxide dismutase; GPX, guaiacol peroxidase; PPX, pyrogallol peroxidase; LP, lipid peroxidation

Time, h	24	72	120
<i>CAT</i> / U g ⁻¹ protein			
Control	3.61 \pm 0.07 ^a	20.06 \pm 0.59 ^c	9.36 \pm 0.33 ^{a,b}
0.1 %	6.50 \pm 0.06 ^a	13.13 \pm 1.39 ^b	11.15 \pm 1.77 ^b
0.2 %	13.04 \pm 0.93 ^b	35.55 \pm 2.79 ^d	12.67 \pm 0.47 ^b
<i>SOD</i> / U mg ⁻¹ protein			
Control	33.82 \pm 0.08 ^a	25.90 \pm 1.91 ^b	11.37 \pm 0.68 ^f
0.1 %	75.65 \pm 0.44 ^d	26.04 \pm 0.15 ^b	27.09 \pm 1.53 ^b
0.2 %	59.80 \pm 0.48 ^c	25.60 \pm 3.06 ^b	19.36 \pm 0.25 ^e
<i>GPX</i> / U mg ⁻¹ protein			
Control	1478 \pm 60 ^{a,b}	1474 \pm 80 ^{a,b}	2077 \pm 76 ^d
0.1 %	1545 \pm 113 ^{a,b}	1363 \pm 77 ^{a,b}	1811 \pm 68 ^c
0.2 %	2742 \pm 122 ^e	1601 \pm 83 ^{a,c}	1218 \pm 71 ^a
<i>PPX</i> / U mg ⁻¹ protein			
Control	1305 \pm 24 ^{a,b}	1348 \pm 21 ^a	1273 \pm 54 ^{a,b}
0.1 %	1020 \pm 47 ^{b,c}	1143 \pm 60 ^b	1225 \pm 39 ^{a,b}
0.2 %	1729 \pm 99 ^d	1690 \pm 76 ^d	947 \pm 22 ^c
<i>LP</i> (MDA content / nmol mg ⁻¹ protein)			
Control	2.38 \pm 0.08 ^a	3.37 \pm 0.07 ^c	1.88 \pm 0.05 ^b
0.1 %	3.46 \pm 0.06 ^c	3.41 \pm 0.04 ^c	3.54 \pm 0.11 ^c
0.2 %	3.33 \pm 0.03 ^c	4.57 \pm 0.10 ^d	3.45 \pm 0.08 ^c

TABLE S-III. Effect of two concentrations of *S. montana* aqueous extracts on the activities of CAT; SOD, GPX and PPX and on the MDA content in the leaves of black nightshade seedlings; the data are mean values \pm standard error; a–g values without the same superscripts within each column differ significantly ($P < 0.05$); CAT, catalase; SOD, superoxide dismutase; GPX, guaiacol peroxidase; PPX, pyrogallol peroxidase; LP, lipid peroxidation

Time, h	24	72	120
<i>CAT</i> / U g ⁻¹ protein			
Control	10.34 \pm 0.11 ^a	25.83 \pm 1.76 ^d	15.28 \pm 0.15 ^b
0.1 %	46.29 \pm 0.21 ^f	32.13 \pm 1.42 ^e	20.67 \pm 0.55 ^c
0.2 %	31.41 \pm 0.97 ^e	26.15 \pm 2.49 ^d	11.81 \pm 0.77 ^a
<i>SOD</i> / U mg ⁻¹ protein			
Control	16.50 \pm 0.04 ^a	16.28 \pm 0.19 ^a	9.88 \pm 0.11 ^e
0.1 %	21.72 \pm 0.22 ^d	23.15 \pm 0.06 ^g	19.49 \pm 0.14 ^b
0.2 %	22.69 \pm 0.13 ^f	21.96 \pm 0.15 ^d	13.80 \pm 0.05 ^c
<i>GPX</i> / U mg ⁻¹ protein			
Control	99.26 \pm 6.03 ^a	94.99 \pm 7.02 ^a	85.71 \pm 5.18 ^a
0.1 %	127.18 \pm 7.73 ^b	98.31 \pm 6.16 ^a	104.41 \pm 5.47 ^{a,b}
0.2 %	99.10 \pm 5.14 ^a	134.73 \pm 15.72 ^b	136.44 \pm 10.84 ^b
<i>PPX</i> / U mg ⁻¹ protein			
Control	145.90 \pm 3.99 ^a	151.05 \pm 3.54 ^a	112.65 \pm 3.88 ^b
0.1 %	137.38 \pm 5.31 ^{a,b}	152.53 \pm 7.59 ^a	94.00 \pm 1.45 ^c
0.2 %	147.96 \pm 4.70 ^a	209.90 \pm 13.76 ^d	120.86 \pm 3.31 ^b
<i>LP</i> (MDA content / nmol mg ⁻¹ protein)			
Control	1.68 \pm 0.04 ^a	2.15 \pm 0.05 ^c	1.96 \pm 0.08 ^b
0.1 %	2.38 \pm 0.03 ^d	2.39 \pm 0.03 ^d	2.67 \pm 0.05 ^e
0.2 %	1.91 \pm 0.02 ^b	2.64 \pm 0.05 ^e	2.17 \pm 0.03 ^c

TABLE S-IV. Effect of two concentrations of *S. montana* aqueous extracts on the activities of CAT, SOD, GPX and PPX and on the MDA content in the roots of pepper seedlings; the data are mean values \pm standard error; a–g values without the same superscripts within each column differ significantly ($P < 0.05$); CAT, catalase; SOD, superoxide dismutase; GPX, guaiacol peroxidase; PPX, pyrogallol peroxidase; LP, lipid peroxidation

Time, h	24	72	120
<i>CAT</i> / U g ⁻¹ protein			
Control	22.93 \pm 0.67 ^a	20.40 \pm 0.73 ^b	10.56 \pm 0.22 ^f
0.1 %	12.41 \pm 0.40 ^{e,f}	11.55 \pm 0.39 ^{e,f}	33.37 \pm 1.03 ^c
0.2 %	14.87 \pm 0.80 ^d	13.01 \pm 0.35 ^e	11.05 \pm 0.54 ^f
<i>SOD</i> / U mg ⁻¹ protein			
Control	7.27 \pm 0.15 ^a	7.99 \pm 0.07 ^a	9.34 \pm 0.21 ^b
0.1 %	9.85 \pm 0.20 ^b	2.10 \pm 0.06 ^c	21.41 \pm 0.72 ^f
0.2 %	0.88 \pm 0.03 ^d	11.87 \pm 0.54 ^e	25.28 \pm 0.49 ^g
<i>GPX</i> / U mg ⁻¹ protein			
Control	2.66 \pm 0.22 ^a	3.59 \pm 0.15 ^{b,c}	3.32 \pm 0.17 ^b
0.1 %	2.26 \pm 0.05 ^a	3.44 \pm 0.08 ^{b,c}	2.68 \pm 0.13 ^a
0.2 %	2.30 \pm 0.20 ^a	5.03 \pm 0.10 ^d	3.84 \pm 0.17 ^c

TABLE S-IV. Continued

Time, h	24	72	120
<i>PPX</i> / U mg ⁻¹ protein			
Control	2.62 ± 0.03 ^a	2.41 ± 0.12 ^b	1.88 ± 0.07 ^d
0.1 %	1.48 ± 0.04 ^{e,f}	2.10 ± 0.06 ^c	1.59 ± 0.07 ^e
0.2 %	1.35 ± 0.02 ^f	2.24 ± 0.06 ^c	2.40 ± 0.09 ^b
<i>LP</i> (MDA content / nmol mg ⁻¹ protein)			
Control	2.23 ± 0.17 ^a	2.98 ± 0.06 ^b	2.85 ± 0.24 ^{b,c}
0.1 %	2.29 ± 0.15 ^{a,c}	2.92 ± 0.08 ^b	5.37 ± 0.44 ^d
0.2 %	2.61 ± 0.08 ^{a,b}	2.92 ± 0.06 ^b	2.55 ± 0.11 ^{a,b}

TABLE S-V. Effect of two concentrations of *S. montana* aqueous extracts on the activities of CAT; SOD, GPX and PPX and on the MDA content in the leaves of pepper seedlings; The data are mean values ± standard error; a–g values without the same superscripts within each column differ significantly ($P < 0.05$); CAT, catalase; SOD, superoxide dismutase; GPX, guaiacol peroxidase; PPX, pyrogallol peroxidase; LP, lipid peroxidation

Time, h	24	72	120
<i>CAT</i> / U g ⁻¹ protein			
Control	18.32 ± 0.48 ^a	16.84 ± 0.53 ^a	17.88 ± 0.77 ^a
0.1 %	34.27 ± 0.37 ^e	23.64 ± 0.78 ^b	31.43 ± 0.58 ^d
0.2 %	31.77 ± 1.48 ^d	35.76 ± 0.50 ^e	27.06 ± 0.33 ^c
<i>SOD</i> / U mg ⁻¹ protein			
Control	11.23 ± 0.06 ^a	7.42 ± 0.04 ^f	5.96 ± 0.28 ^g
0.1 %	8.70 ± 0.14 ^e	4.77 ± 0.12 ^h	14.41 ± 0.34 ^d
0.2 %	10.38 ± 0.08 ^b	6.36 ± 0.06 ^g	12.86 ± 0.11 ^c
<i>GPX</i> / U mg ⁻¹ protein			
Control	0.55 ± 0.01 ^a	0.48 ± 0.01 ^b	0.55 ± 0.02 ^a
0.1 %	0.30 ± 0.02 ^d	0.35 ± 0.02 ^{c,d}	0.60 ± 0.02 ^a
0.2 %	0.38 ± 0.04 ^c	0.46 ± 0.01 ^b	0.56 ± 0.02 ^a
<i>PPX</i> / U mg ⁻¹ protein			
Control	0.59 ± 0.01 ^a	0.71 ± 0.02 ^c	0.77 ± 0.01 ^d
0.1 %	0.53 ± 0.01 ^e	0.67 ± 0.02 ^{b,c}	0.74 ± 0.01 ^{c,d}
0.2 %	0.59 ± 0.01 ^a	0.66 ± 0.03 ^b	0.61 ± 0.02 ^{a,b}
<i>LP</i> (MDA content / nmol mg ⁻¹ protein)			
Control	2.76 ± 0.14 ^a	2.86 ± 0.06 ^a	3.29 ± 0.07 ^c
0.1 %	2.38 ± 0.05 ^b	2.81 ± 0.07 ^a	2.83 ± 0.05 ^a
0.2 %	2.48 ± 0.11 ^b	2.95 ± 0.04 ^a	2.72 ± 0.05 ^a