

Supplementary material

Onion Peel as a Potential Source of Antioxidants and Antimicrobial Agents

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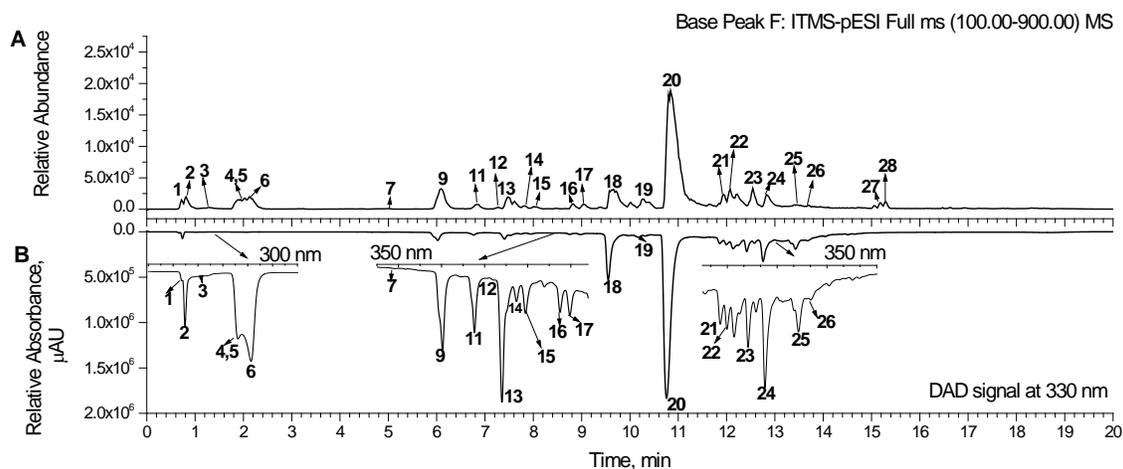


Fig. S1 Representative UHPLC chromatogram of ethanol extract, recorded from MS-signal ranged by base peak (A) and DAD-signal at 330 nm (B). Additionally, for better visibility of the peaks, three insets show enlarged parts of the chromatogram at 300 nm (0-3 min), 350 nm (4.5-9.4 min) and 350 nm (11.5-15 min) (B). The numbers marking the peaks are in accord with the numbering of the corresponding detected compounds in Table 1.

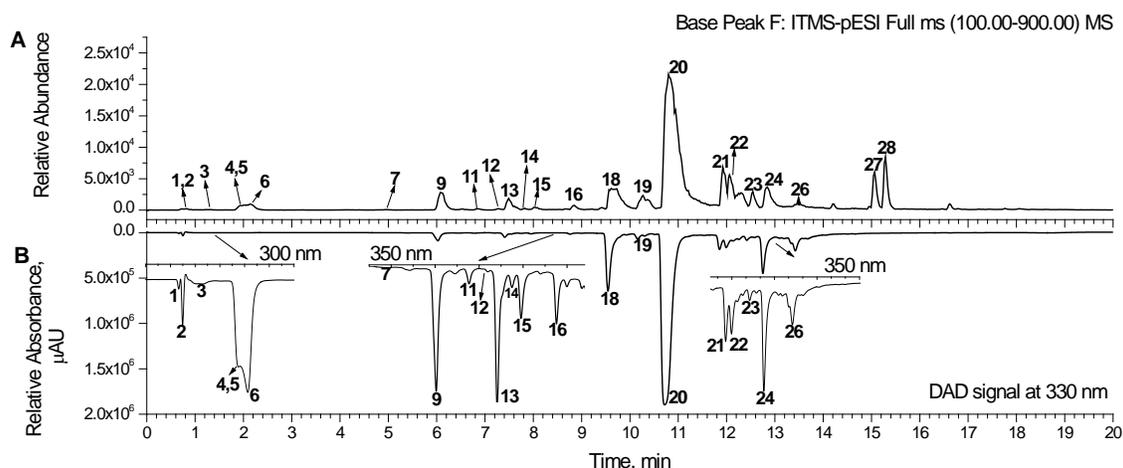


Fig. S2 Representative UHPLC chromatogram of acetone extract, recorded from MS-signal ranged by base peak (A) and DAD-signal at 330 nm (B). Additionally, for better visibility of the peaks, three insets show enlarged parts of the chromatogram at 300 nm (0-3 min), 350 nm (4.5-9.4 min) and 350 nm (11.5-15 min) (B). The numbers marking the peaks are in accord with the numbering of the corresponding detected compounds in Table 1.

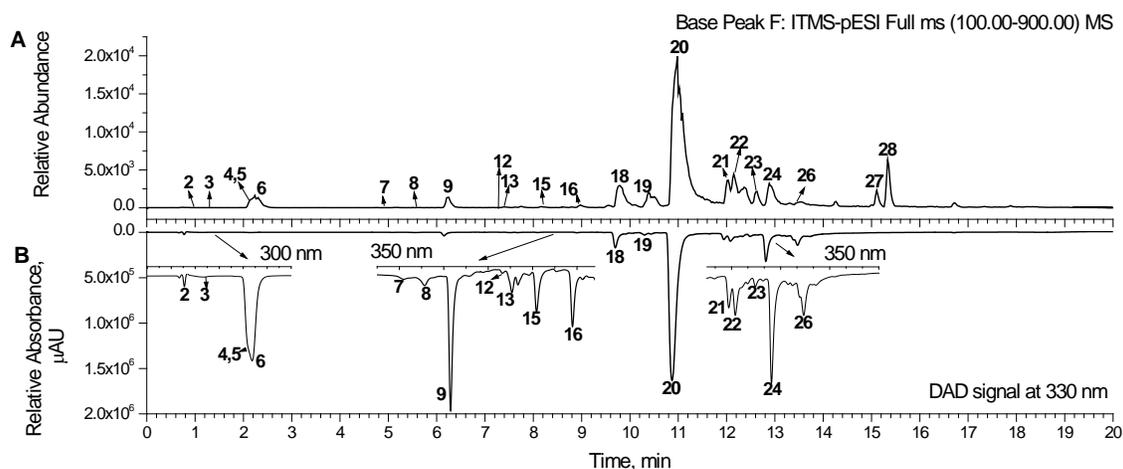


Fig. S3 Representative UHPLC chromatogram of ethyl acetate extract, recorded from MS-signal ranged by base peak (A) and DAD-signal at 330 nm (B). Additionally, for better visibility of the peaks, three insets show enlarged parts of the chromatogram at 300 nm (0-3 min), 350 nm (4.5-9.4 min) and 350 nm (11.5-15 min) (B). The numbers marking the peaks are in accord with the numbering of the corresponding detected compounds in Table 1.

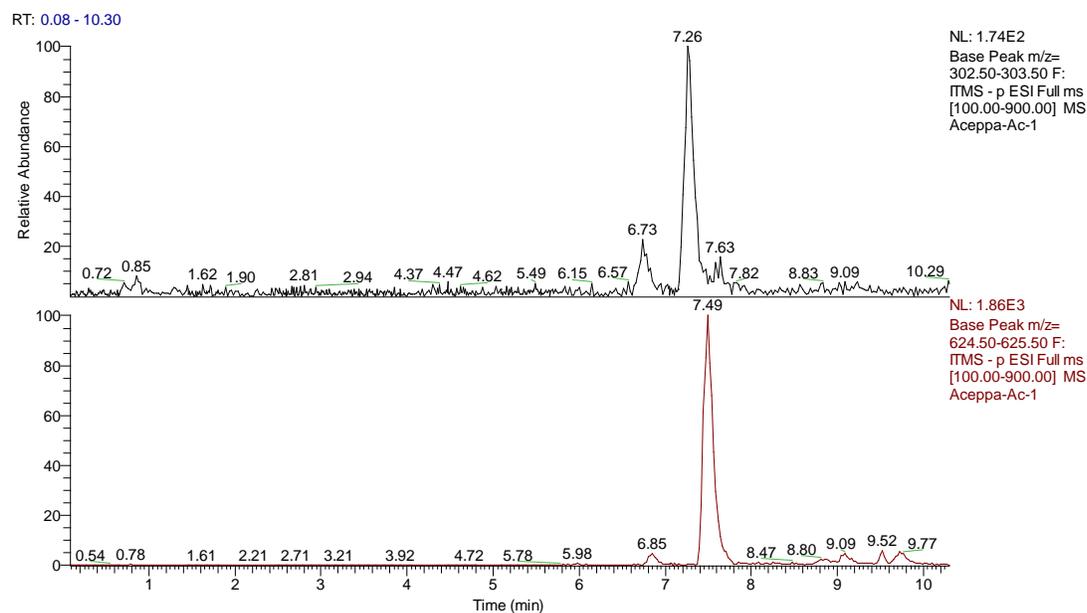


Fig. S4 UHPLC-MS chromatograms with extracted molecular ion peaks for compounds with similar retention times, No. 12 and No. 13 (taxifolin and quercetin dihexoside, at m/z 303 and m/z 625, up and down, respectively).

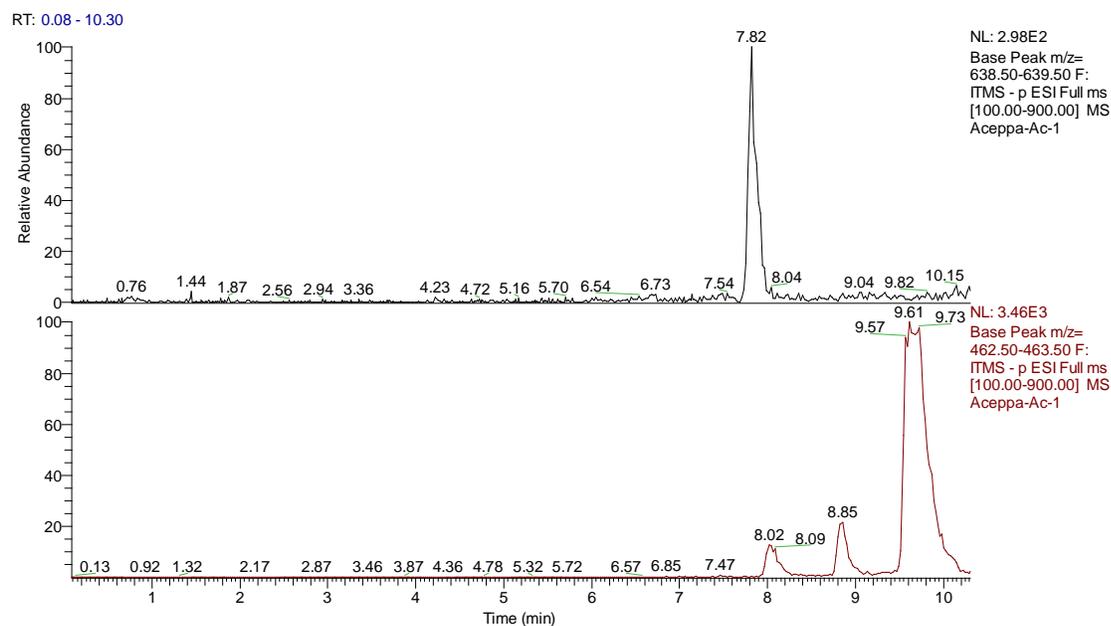


Fig. S5 UHPLC-MS chromatograms with extracted molecular ion peaks for compounds with similar retention times, No. 14 and No. 15 (Isorhamnetin-dihexoside and quercetin hexoside, at m/z 639 and m/z 463 up and down, respectively).

UHPLC - Quantification method of quercetin and quercetin-hexoside

Table S2 supplemental: Supplemental data for the calculation of quercetin and quercetin-hexoside concentrations in the extracts (in mg/gDW): The corresponding linear regression equations; the concentration range used for quercetin and its hexoside (most probable glucoside, comp. no. 20 and 18), LOD and LOQ values (in mg/g); and concentrations of quercetin and quercetin-hexoside in methanol, ethanol, acetone and ethyl acetate extracts.

	Quercetin	Quercetin-hexoside*
Linear regression equation (Correlation coefficient)	$y = 26905.3 \cdot x + 345366.4$ ($R^2 = 0.989$)	$y = 51230.4 \cdot x - 57718.3$ ($R^2 = 0.999$)
Concentration range (mg/g)	6.25-125	1.5-15
LOD (mg/g)	0.08	0.27
LOQ (mg/g)	0.24	0.83
Methanol	48.53 ± 7.95^a	6.22 ± 1.42^a
Ethanol	14.91 ± 0.73^b	3.67 ± 0.13^b
Acetone	38.47 ± 4.67^{ac}	3.94 ± 0.11^b
Ethyl acetate	29.01 ± 0.71^c	2.17 ± 0.1^b

* Concentration and content of quercetin-hexoside (which is tentatively assigned as quercetin-4-O-glucoside) was determined as quercetin-3-O-glucoside equivalent, by using the corresponding reference standard for the experiments.

Linearity, LOD (Limit of detection) and LOQ (Limit of quantification) were determined.

Quercetin and quercetin-3-O-glucoside were used as reference standards for the analyses.

Standard solutions were obtained by dissolving the corresponding compounds in methanol, and several concentrations were prepared for the chromatography analyses by using a DAD detector set at 350 nm.

The corresponding peaks areas were obtained from the chromatograms: at ≈ 8.89 min for quercetin-3-O-glucoside and ≈ 10.85 min for quercetin. Injection volume for all solutions, standards and extracts samples was 4 μ l. For quercetin, the concentrations used, recalculated to mg/gDW were 12.5-125 mg/gDW; for LOD and LOQ determination, the concentrations range of the reference standard quercetin was 1.25-12.5 mg/gDW. The concentrations range used for the calibration diagrams, and LOD and LOQ determination of quercetin-3-O-glucoside, was 1.5-15 mg/gDW.

Linearity was evaluated by the linear regression equation for the selected compounds (quercetin and quercetin-3-O-glucoside), with correlation coefficient values $R^2 \geq 0.98$.

Quercetin and quercetin-hexoside LOD and LOQ determination was conducted by using equations including "slope" means and standard deviation of the intercept at low concentration ranges:

$$\text{LOD} = (3.3 \times \sigma) / B$$

$$\text{LOQ} = (10 \times \sigma) / B$$

Results of the quantitative analysis for quercetin and quercetin-hexoside by using peak areas at t_{ret} 10.85 min and 9.77 min in the extracts, respectively, were calculated in units of mg/gDW, according to the linear regression equations for the reference standards calibration diagrams (the data is presented in Table 2S).