

Supporting Information

Title: Inducing plant defence reactions in tobacco plants with phenolic-rich extracts from red maple leaves: a characterization of main active ingredients

Authors: Elodie Peghaire ^{1,‡}, Samar Hamdache ^{2,‡}, Antonin Galien ¹, Mohamad Sleiman ^{2,3}, Alexandra ter Halle⁴, Hicham El Alaoui⁵, Ayhan Kocer⁶, Claire Richard ^{2*}, Pascale Goupil ^{1*}

¹UMR INRA 547 PIAF, Université Clermont Auvergne, 63178 Aubière, France

²UMR CNRS 6296 ICCF, Université Clermont Auvergne, 63178 Aubière, France

³ UMR CNRS 6296 SIGMA, Université Clermont Auvergne, 63178 Aubière, France

⁴UMR CNRS 5623 IMRCP, Université Paul Sabatier, 31062 Toulouse, France

⁵UMR CNRS 6023 LMGE, Université Clermont Auvergne, 63178 Aubière, France

⁶UMR CNRS/INSERM 6293 GReD, Université Clermont Auvergne, 63000 Clermont-Ferrand, France

[‡]First authors

*Corresponding authors

Tel: +33 04 73 40 79 40. Fax: +33 04 73 40 79 42. E-mail: pascale.goupil@uca.fr (P.G.)

Tel: +33 04 73 40 71 42. Fax: +33 04 73 40 71 42 E-mail: claire.richard@uca.fr (C.R)

Keywords: alkaline hydrolysis, defence reactions, gallotanins, red maple leaf extract, tobacco

Figure SI-1: HPLC-UV chromatograms of aqueous extracts RME1 and RME2 prepared at 0.19% in polyphenols. Top figures relate to 2D spectra while bottom figures relate to chromatograms extracted at 278 nm.

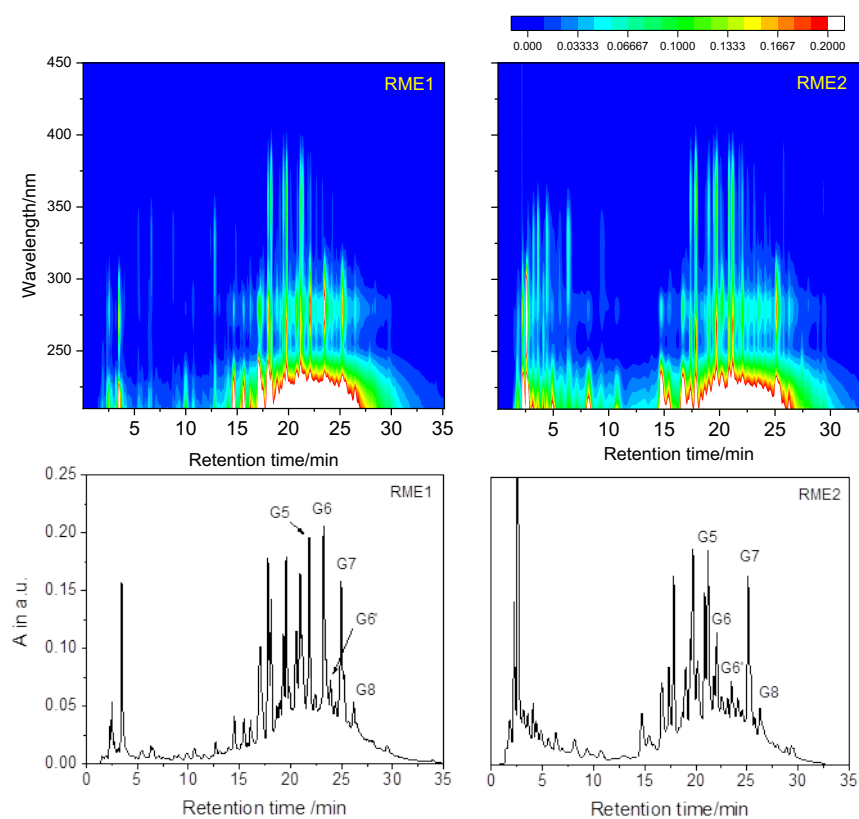


Figure SI-2 : UPLC-HR-MS chromatogram of RME1 extract. Upper view for UV detection and bottom view for TIC detection

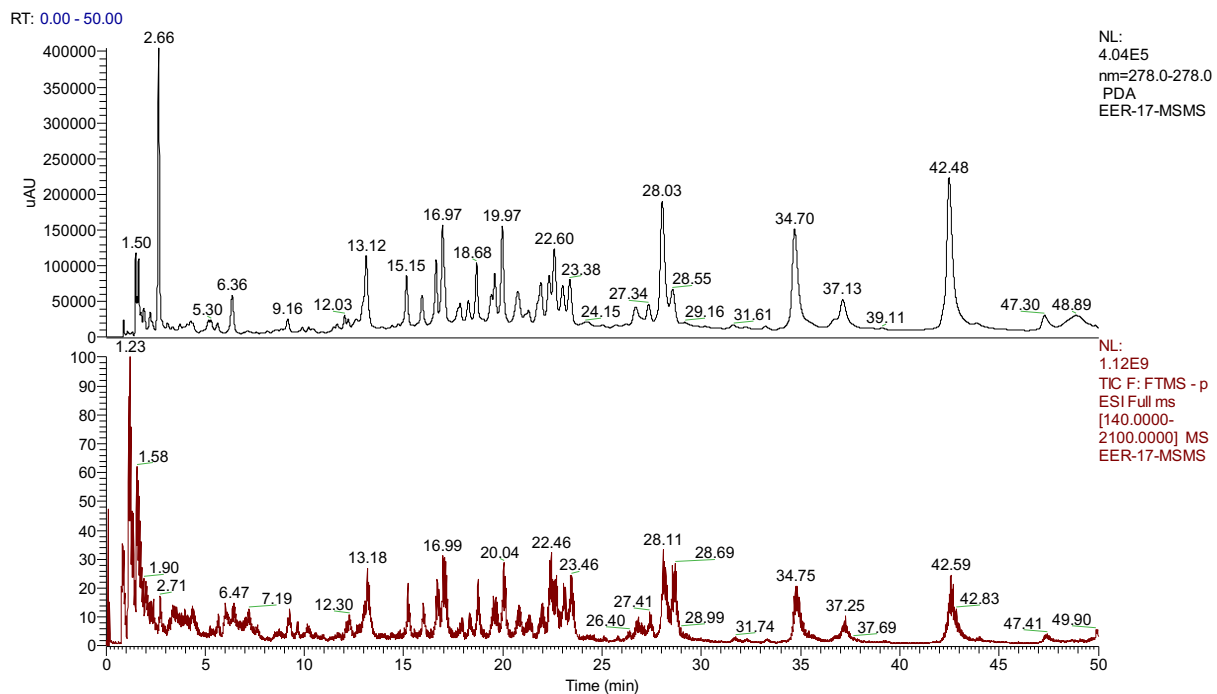
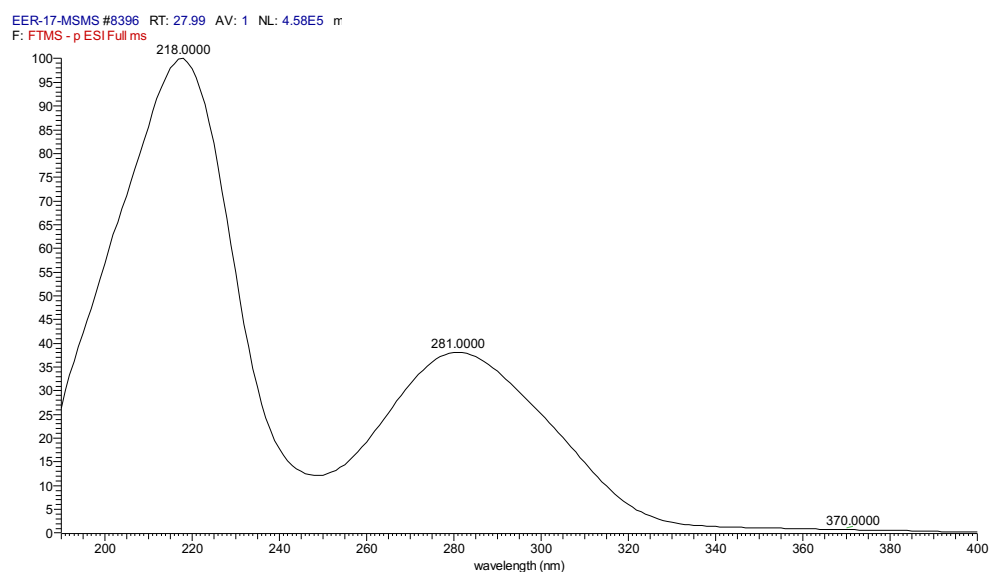
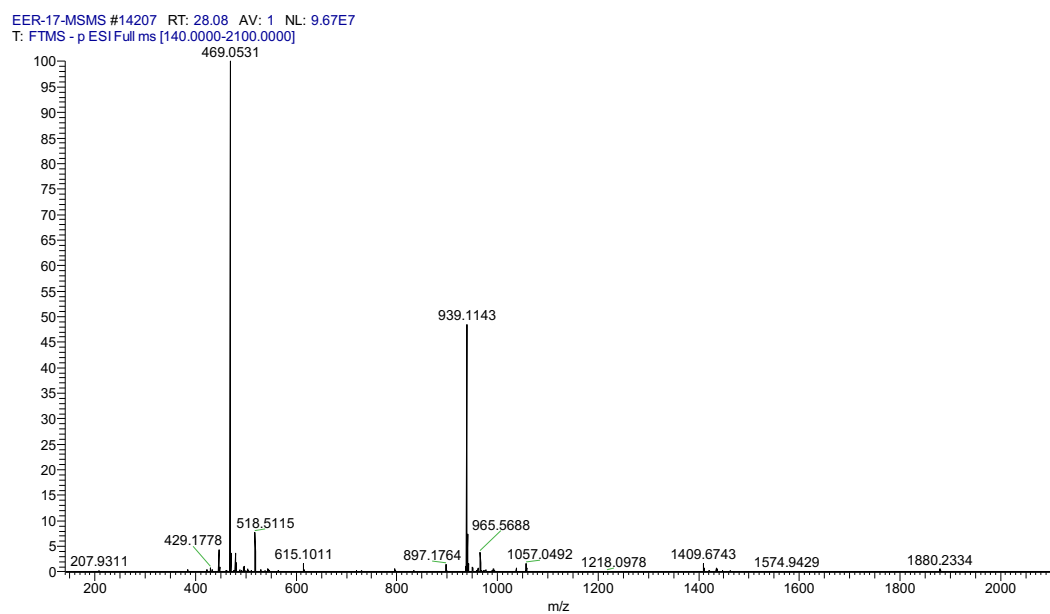


Figure SI-3 : UPLC-HR-MS data for pentagallate glucose (G5)

A : UV spectrum



B : HR-MS spectrum



C : MS-MS on ion m/z= 469

EER-17-MSMS #14242 RT: 28.15 AV: 1 NL: 1.74E7

F: FTMS - p ESI Full ms2 469.0000@hcd35.00 [65.3333-980.0000]

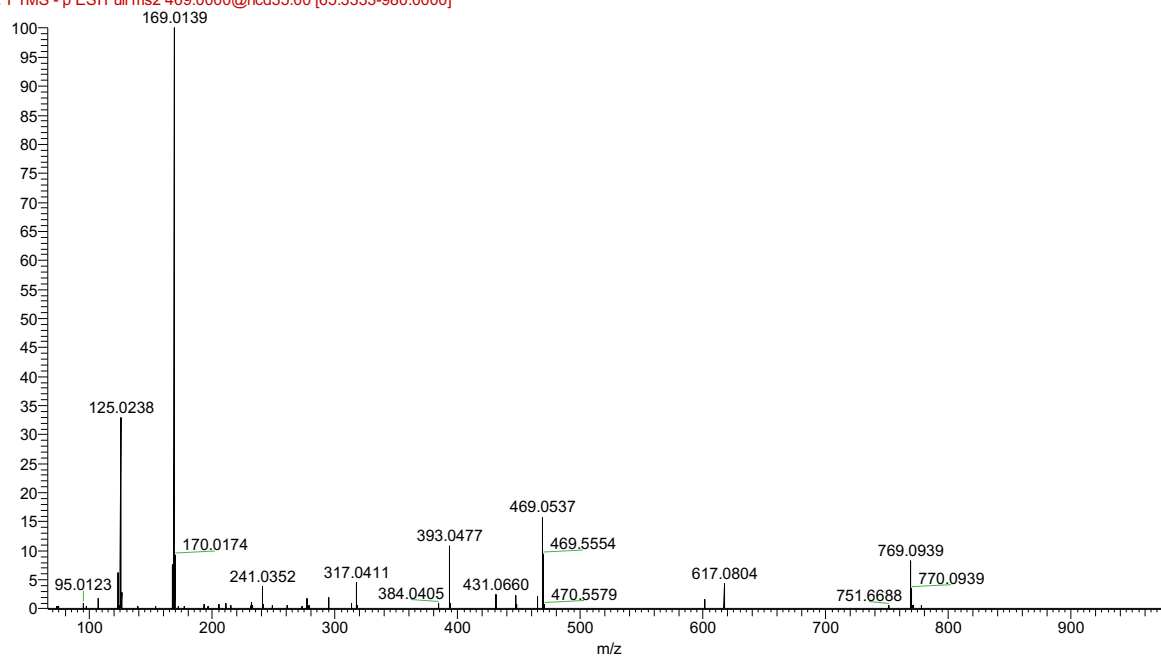
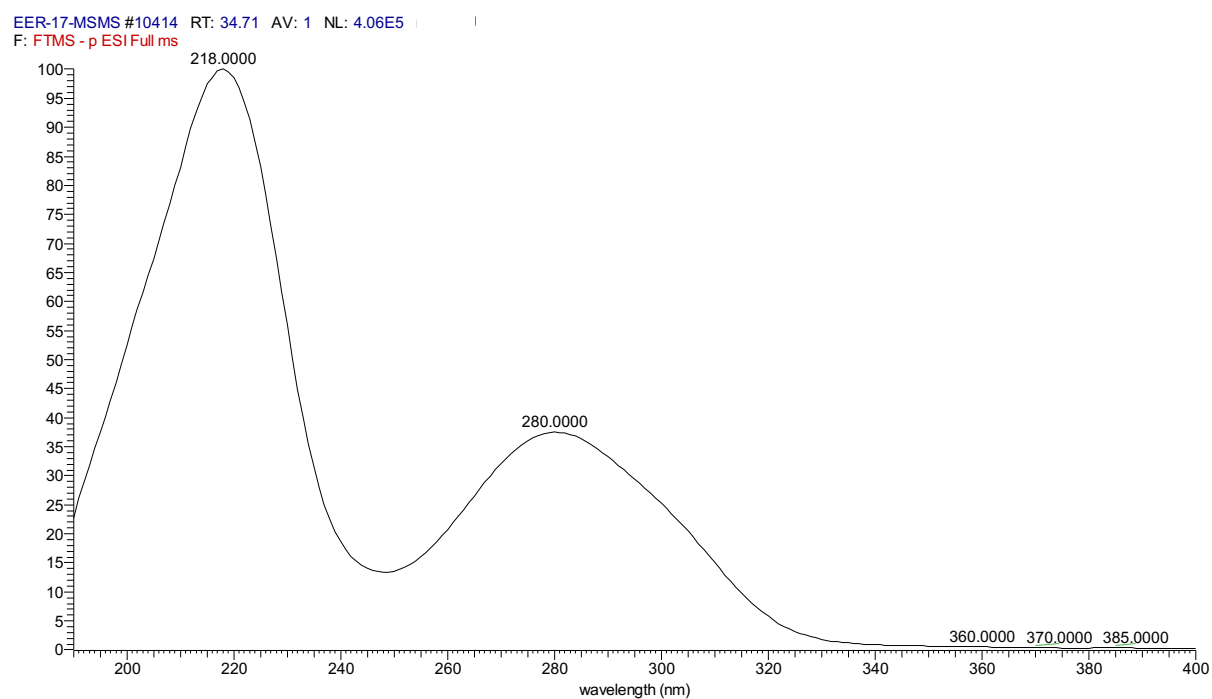
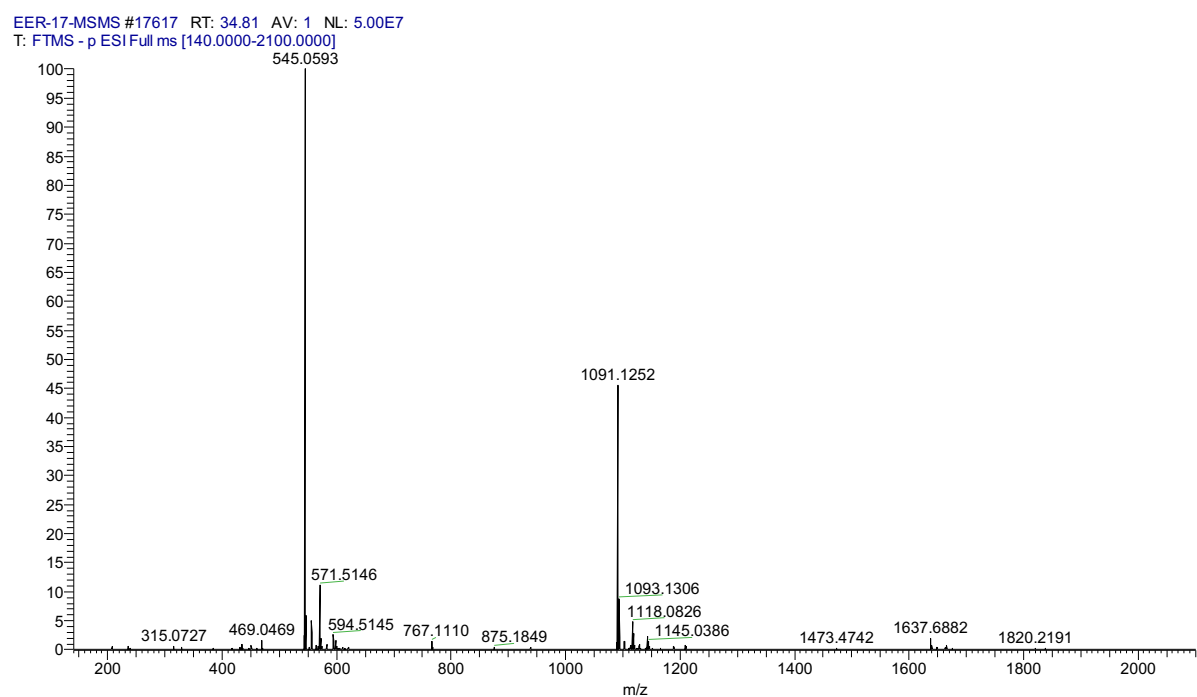


Figure SI-4 : UPLC-HR-MS data for hexagallate glucose (G6 and G6')

A : UV spectrum



B : HR-MS spectrum



C : MS-MS on ion m/z= 545

EER-17-MSMS #17594 RT: 34.77 AV: 1 NL: 1.61E7

F: FTMS - p ESI Full ms2 545.0000@hcd35.00 [75.6700-1135.0000]

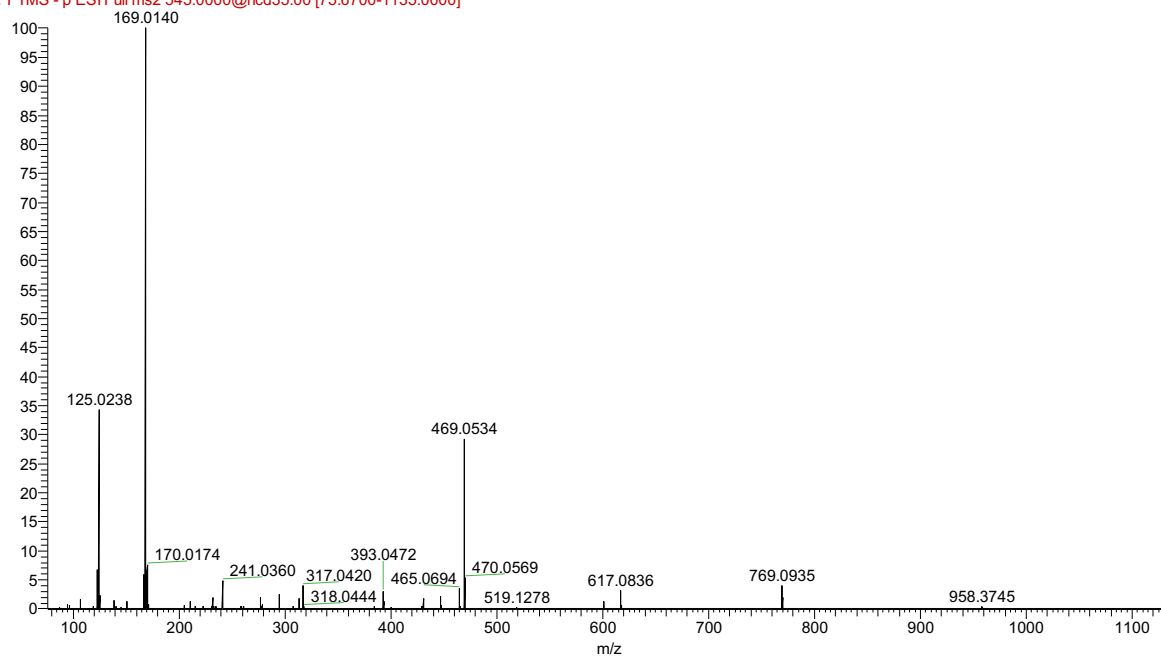
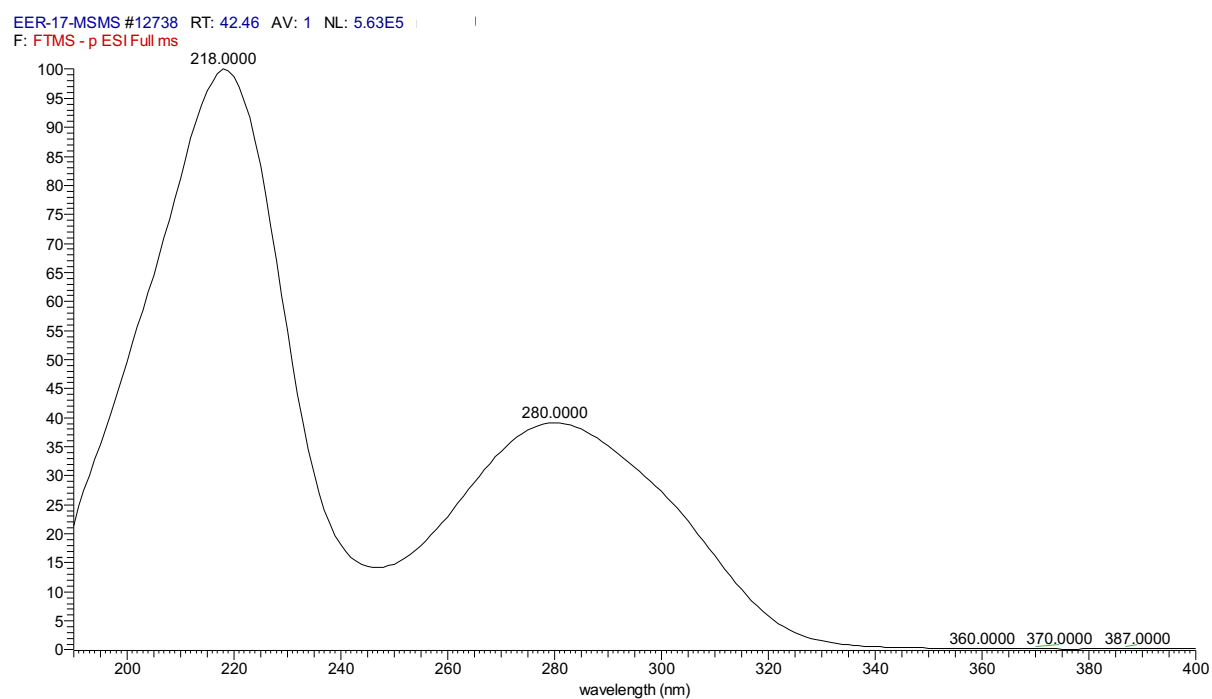
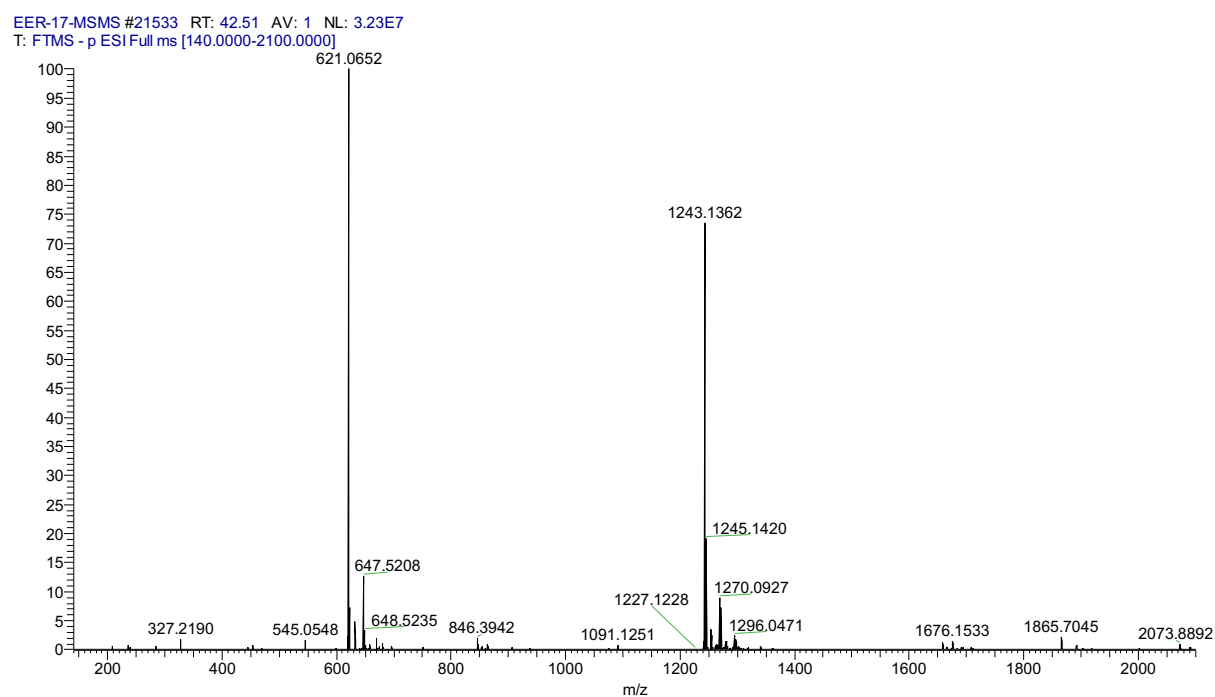


Figure SI-5 : UPLC-HR-MS data for heptagallate glucose (G7)

A : UV spectrum



B : HR-MS spectrum



C : MS-MS on ion m/z= 621

EER-17-MSMS #21536 RT: 42.52 AV: 1 NL: 1.14E7

F: FTMS - p ESI Full ms2 621.0000@hcd35.00 [86.0000-1290.0000]

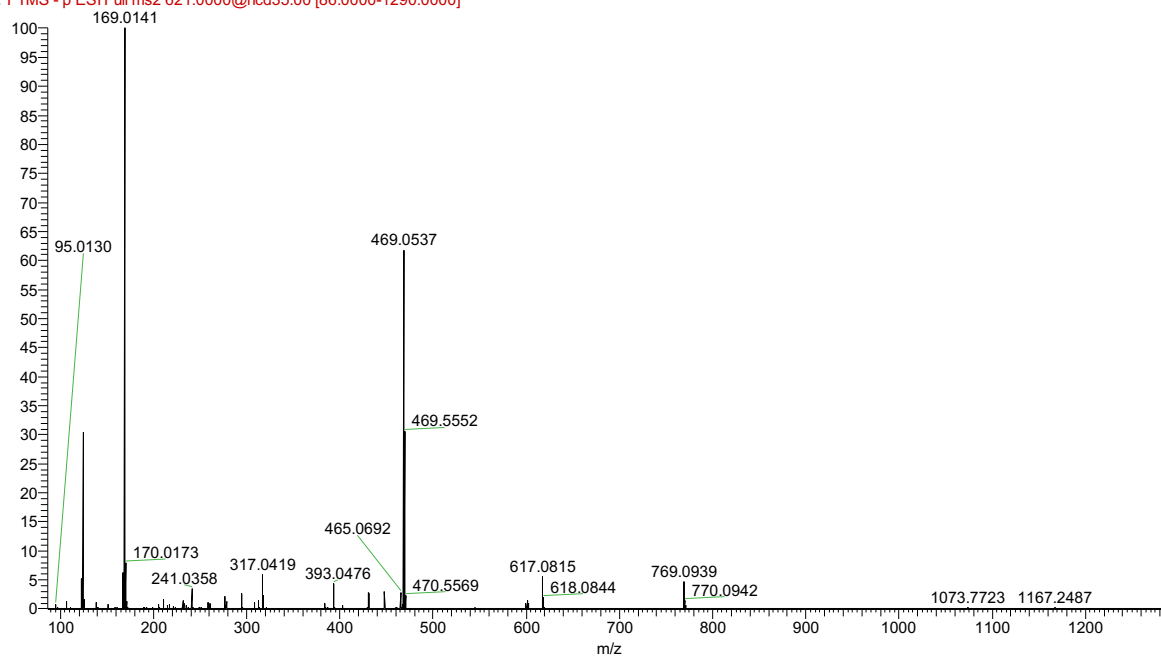
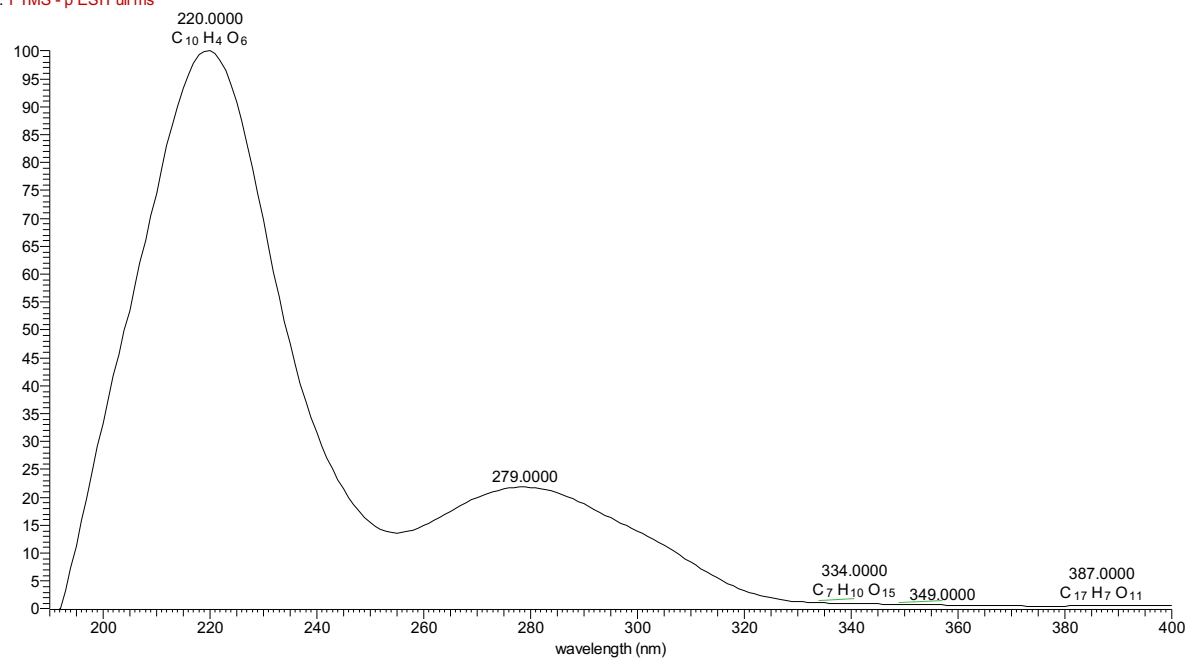


Figure SI-6 : UPLC-HR-MS data for octagallate glucose (G8)

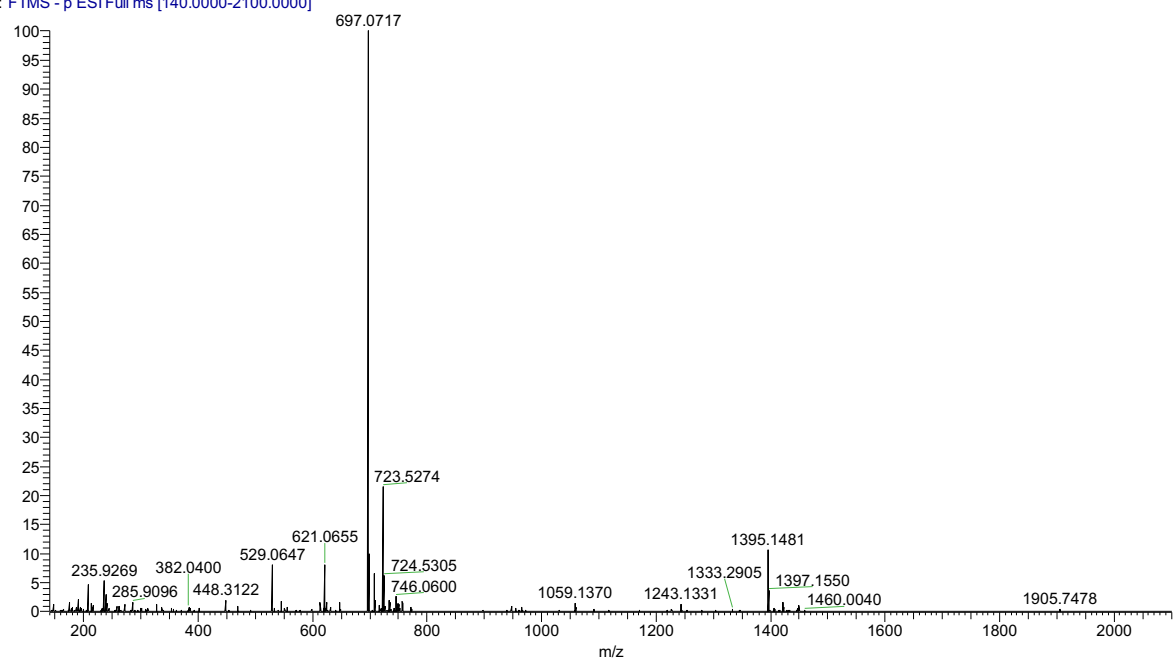
A : UV spectrum

EER-17-MSMS #14196 RT: 47.32 AV: 1 NL: 1.39E5 m
F: FTMS - p ESI Full ms



B : HR-MS spectrum

EER-17-MSMS #24019 RT: 47.41 AV: 1 NL: 7.60E6
T: FTMS - p ESI Full ms [140.0000-2100.0000]



C : MS-MS on ion $m/z = 697$

EER-17-MSMS #24038 RT: 47.45 AV: 1 NL: 2.76E6

F: FTMS - p ESI Full ms2 697.0000@hcd35.00 [96.3333-1445.0000]

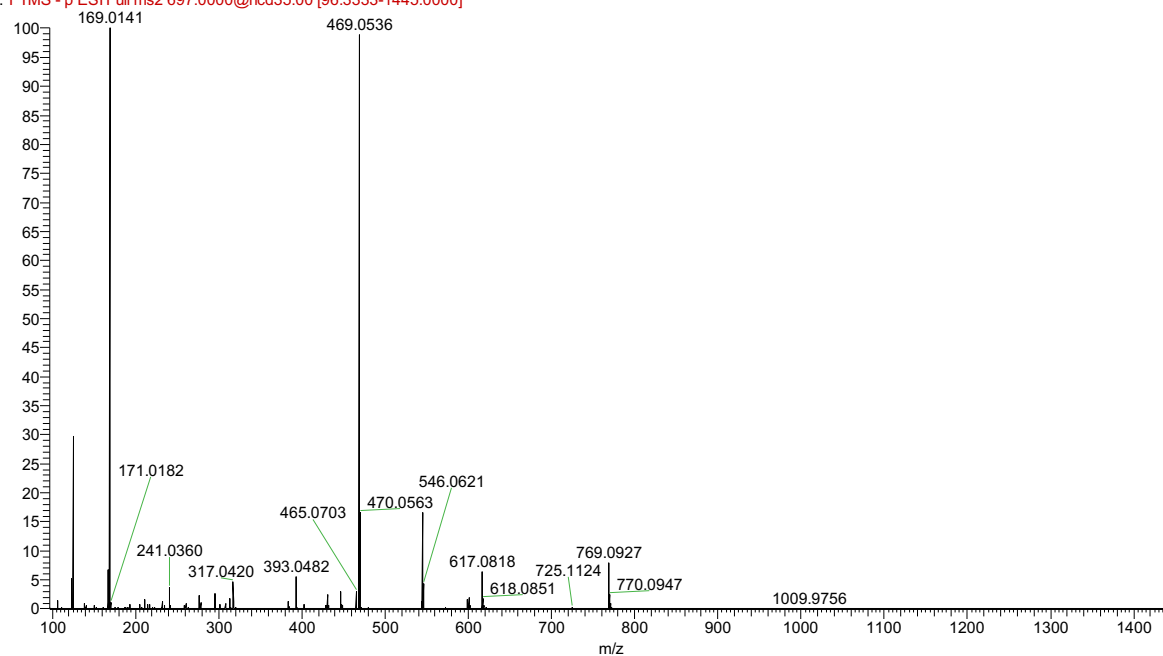
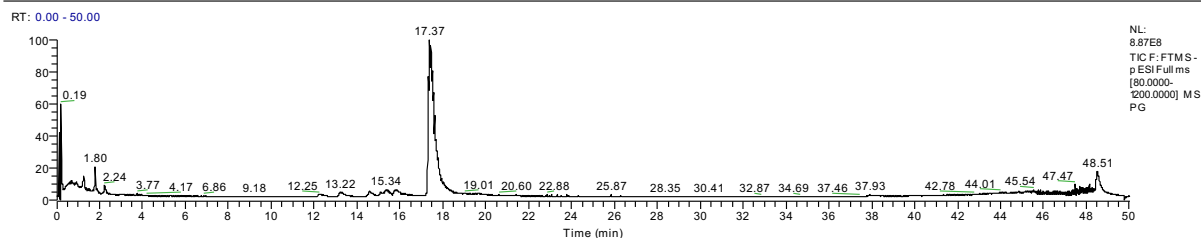


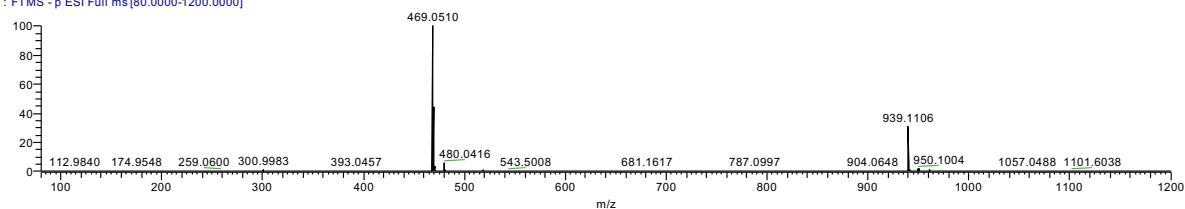
Figure SI-7 : UPLC-HRMS spectra of commercial 1,2,3,4,6-penta-O-galloyl- β -D-glucopyranose and RME1 in the same conditions (the gradient is different from the one used in Figures SI-2 to SI-6). 1,2,3,4,6-penta-O-galloyl- β -D-glucopyranose and G5 are eluted at 17.37 and 17.45 min, respectively.

D:\Seafire\...HPLC_MS_newSPA\PG

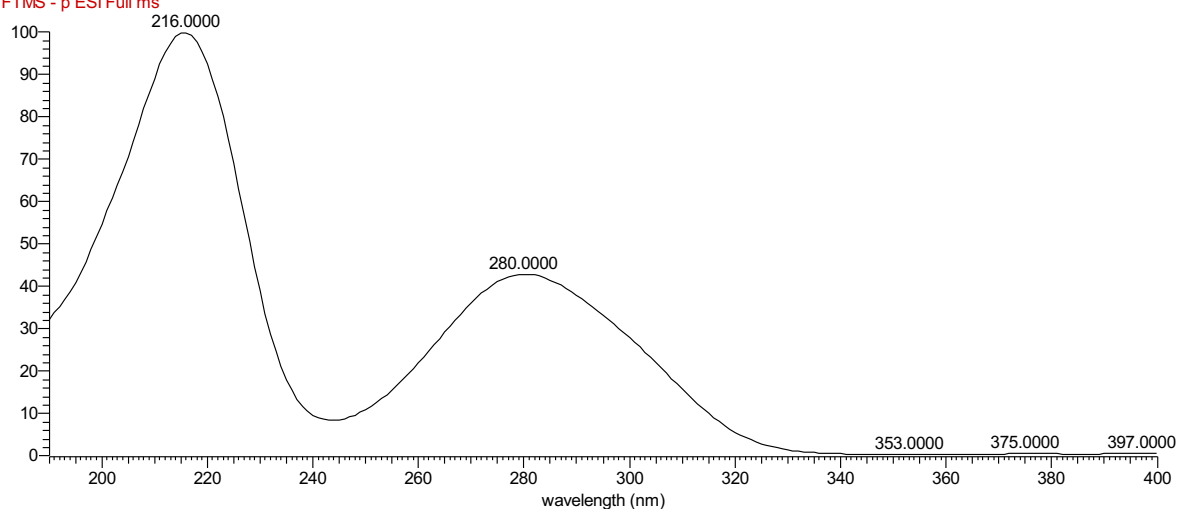
09/27/18 06:14:45

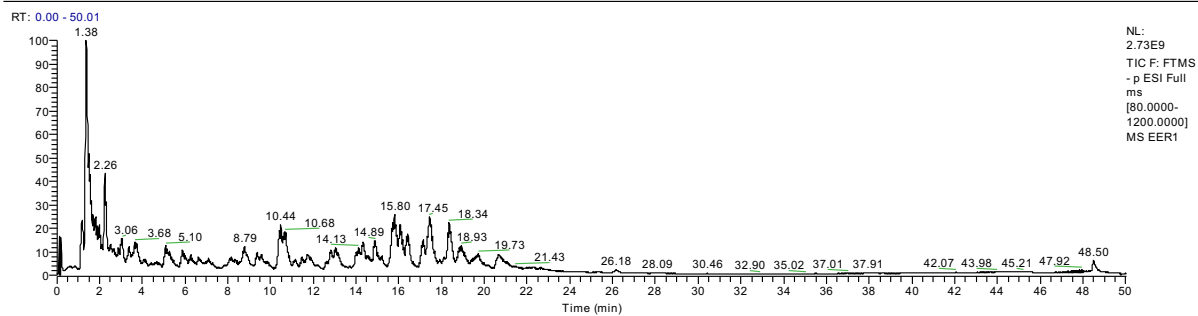


PG #3868 RT: 17.40 AV: 1 NL: 2.86E8
T: FTMS - p ESI Full ms [80.0000-1200.0000]



PG #5200 RT: 17.33 AV: 1 NL: 6.36E5
F: FTMS - p ESI Full ms





EER1 #3865 RT: 17.35 AV: 1 NL: 1.10E8
T: FTMS - p ESI Full ms [80.0000-1200.0000]

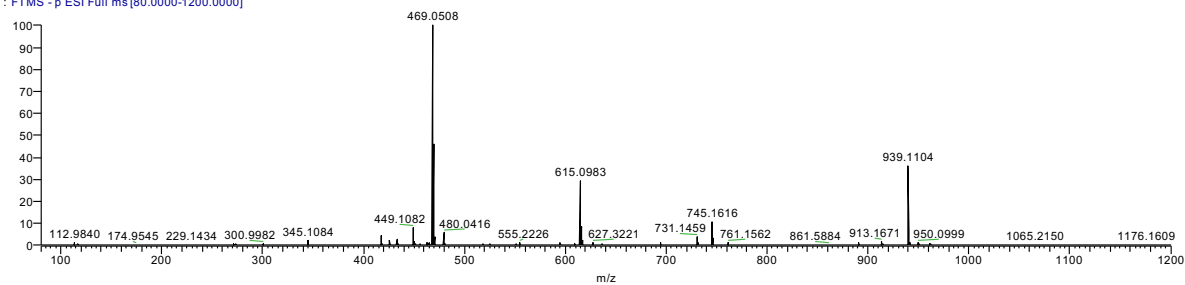


Figure SI-8 : Macroscopic symptoms induced in tobacco leaves by gallic acid infiltration at 4 dpi observed under bright light (A) and UV light (B). Tobacco leaves were infiltrated with a range of gallic acid concentrations from the one measured in h-RME: 150 mg of gallic acid (1) diluted twice (2), 4 fold (4), 8 fold (8) and 16 fold (16). A-B represent the same half leaf joined together with UV image reversed horizontally. Bar 1.5 cm

