

Supplementary data 1

Table S1. Comparaison of dry weight of different part (roots. stems and leaves) of wild-type (LuT) and transgenic (Pi1AM) flax lines, at D1 and D5 in control conditions (n=8).

		Dry Weight (mg)															
	N°	<i>Pi1AM</i>								<i>LuT</i>							
		1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
Roots	D1	147.9	158.7	106.8	229.57	168.8	116.4	209.1	125.3	141.3	154.1	158.3	112.2	144.6	156.8	173.3	142
	D5	133.8	123	117.4	128	148.3	146.9	178.6	156.5	114.7	117.7	118.9	157.7	150.4	185.9	159.3	102.9
Stems	D1	563.90	688.40	483.10	653.60	476.60	587.50	494.50	460.90	517.40	632.20	576.50	685.80	524.40	599.40	695.90	658.10
	D5	907.70	787.00	869.50	834.50	875.90	788.20	825.60	931.80	784.00	704.60	738.70	681.40	969.90	861.40	889.90	688.50
Leaves	D1	567.78	650.60	533.60	547.19	639.07	555.28	540.81	436.63	475.83	574.35	636.72	594.95	470.78	452.18	664.36	561.73
	D5	841.42	978.52	846.79	676.91	861.23	713.56	843.6	993.09	675.15	731.79	66.14	653.18	820.81	813.48	889.46	890.4

Supplementary data 2

Table S2. The VIP score and Log10 (Ratio Pi1AM/LuT) of the discriminant metabolites between LuT and Pi1AM of different plant part, in control conditions.

	Roots	VIP score	Log10 (Ratio Pi1AM/LuT)
LC-MS	DCG	1.89019	-
	PMG	1.81812	1.25
	PDG	1.51188	1.08
	Coniferin	1.20745	0.36
	lotaustralin	0.89665	0.17
	Linamarin	0.856045	0.14
	SMG	1.84952	-0.82
	LMG	1.73832	-0.5
NMR	Coniferyl Alcohol	1.31626	0.89
	Sucrose	1.01421	0.31
	Glucose	1.00465	0.26
	Fructose	0.92145	0.23
	Succinic Acid	0.90235	0.21
	Putrescine	0.90565	0.20
	Serine	0.86594	0.17
	Lotaustralin	0.85335	0.17
	Linamarin	0.866358	0.15
	Glycine	0.844595	0.14
	Fumaric Acid	0.832954	0.12
	Threonine	0.790184	0.08
	Aspartic Acid	1.09956	-0.25
	Glutamine	1.056587	-0.2
	Glutamic Acid	1.005789	-0.18
	Maltose	0.75862	-0.06

	Stems	VIP score	Log10 (Ratio Pi1AM/LuT)
LC-MS	DCG	2.27601	-
	PMG	2.11299	0.72
	PDG	1.85297	0.67
	Carlinoside	1.58547	0.44
	Lucenin-2	1.55471	0.43
	Coniferin	1.4326	0.38
	Orientin	1.2658	0.28
	Neolunistatin	1.09578	0.26
	CAFG	0.8868	0.15
	Chlorogenic Acid	0.8258	0.12
	FAG	0.8164	0.08
	LDG	2.14607	-0.76
	LMG	1.45473	-0.13
	Linamarin	1.00458	-0.11
	lotaustralin	1.00546	-0.11
	Triticuside-A	1.00541	-0.09
	coniferyl Alcohol	1.84679	0.93
NMR	Glycerol	1.25878	0.74
	Tyrosine	1.15689	0.27
	Phenylalanine	1.14565	0.2
	Glucose	1.01569	0.15
	Glutamic Acid	0.90458	0.14
	Aspartic Acid	0.90469	0.10
	Galactose	0.78698	0.07
	Alanine	0.90125	-0.15
	Succinic Acid	0.88985	-0.13
	Tartaric Acid	0.88875	-0.13
	Asparagine	0.81564	-0.11
	Malic Acid	0.76594	-0.08
	Linamarin	0.71568	-0.08
	Putrescine	0.71238	-0.07
	Threonine	0.70023	-0.06
	Lotaustralin	0.65892	-0.05

	Leaves	VIP score	Log10 (Ratio Pi1AM/LuT)
LC-MS	DCG	1.90774	-
	PDG	1.87959	1.17
	PMG	1.81343	1.13
	Coniferin	1.41243	0.88
	Chlorogenic Acid	1.00678	0.17
	Carlinoside	1.05864	0.16
	Linustatin	0.85687	0.1
	FAG	0.76987	0.09
	Lucenin -2	0.69658	0.08
	CAFG	0.68659	0.04
	LMG	1.495326	-0.3
	Vitexin	0.89178	-0.16
	Triticuside-A	0.79576	-0.11
NMR	coniferyl Alcohol	1.61418	1.01
	Tyrosine	1.05687	0.57
	Choline	1.09456	0.24
	Fructose	1.01867	0.23
	Glycerol	1.00356	0.17
	Glucose	1.00238	0.12
	Sucrose	1.00568	0.12
	Raffinose	0.88657	0.1
	Chicoric Acid	0.76125	0.08
	Serine	0.76575	0.05
	Uridine	1.01567	-0.25
	Adenosine	1.00458	-0.22
	GABA	0.90254	-0.2
	Alanine	0.87869	-0.19
	Phenylalanine	0.80051	-0.15
	Galactose	0.79476	-0.12
	Threonine	0.78697	-0.11
	Ethanolamine	0.74567	-0.1
	Asparagine	0.70865	-0.07
	Tartaric Acid	0.70681	-0.04

Supplementary data 3

LuT

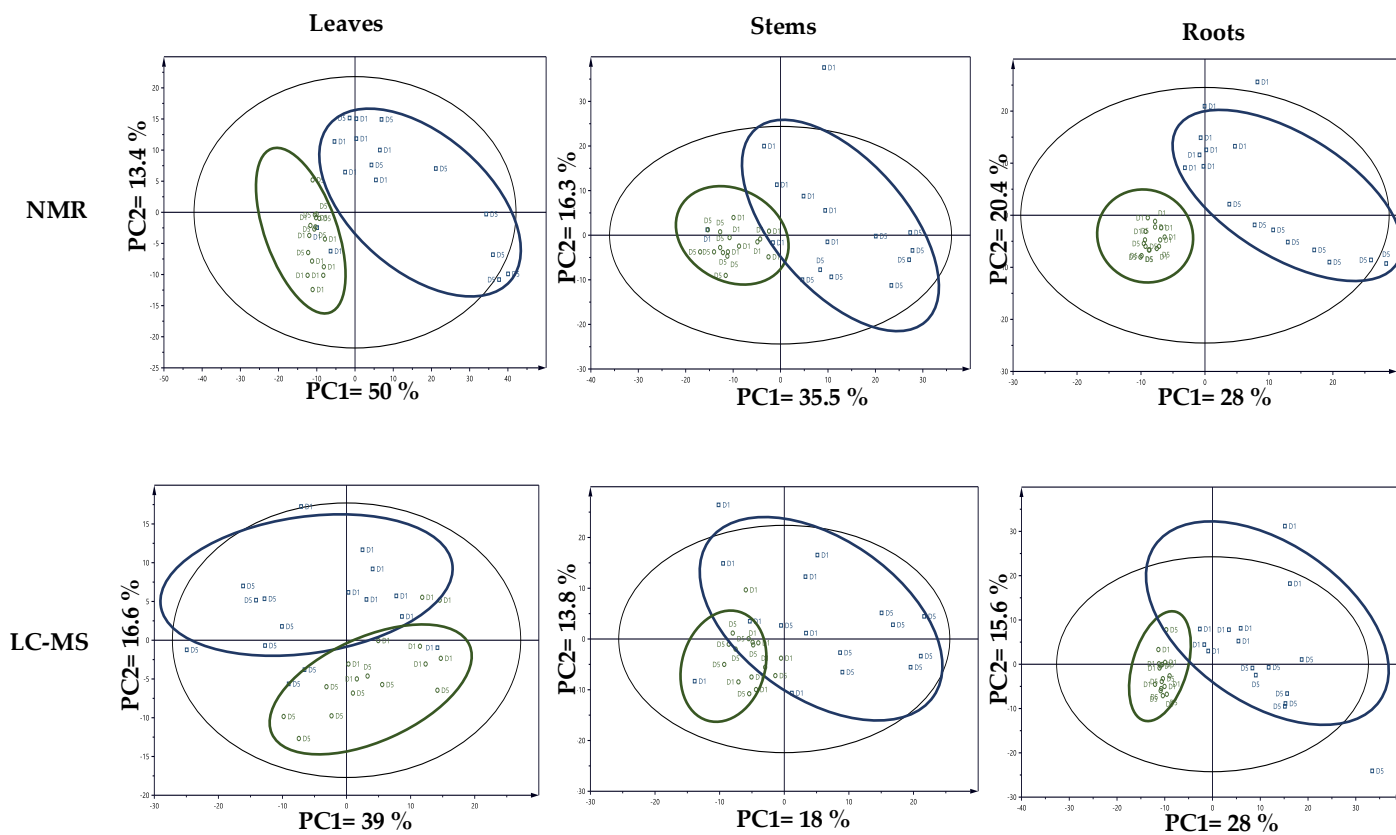


Figure S1. Score plot of principal component analysis (PCA) based on ^1H -NMR and LC-MS data for LuT control or stressed samples in flax roots, stems and leaves.

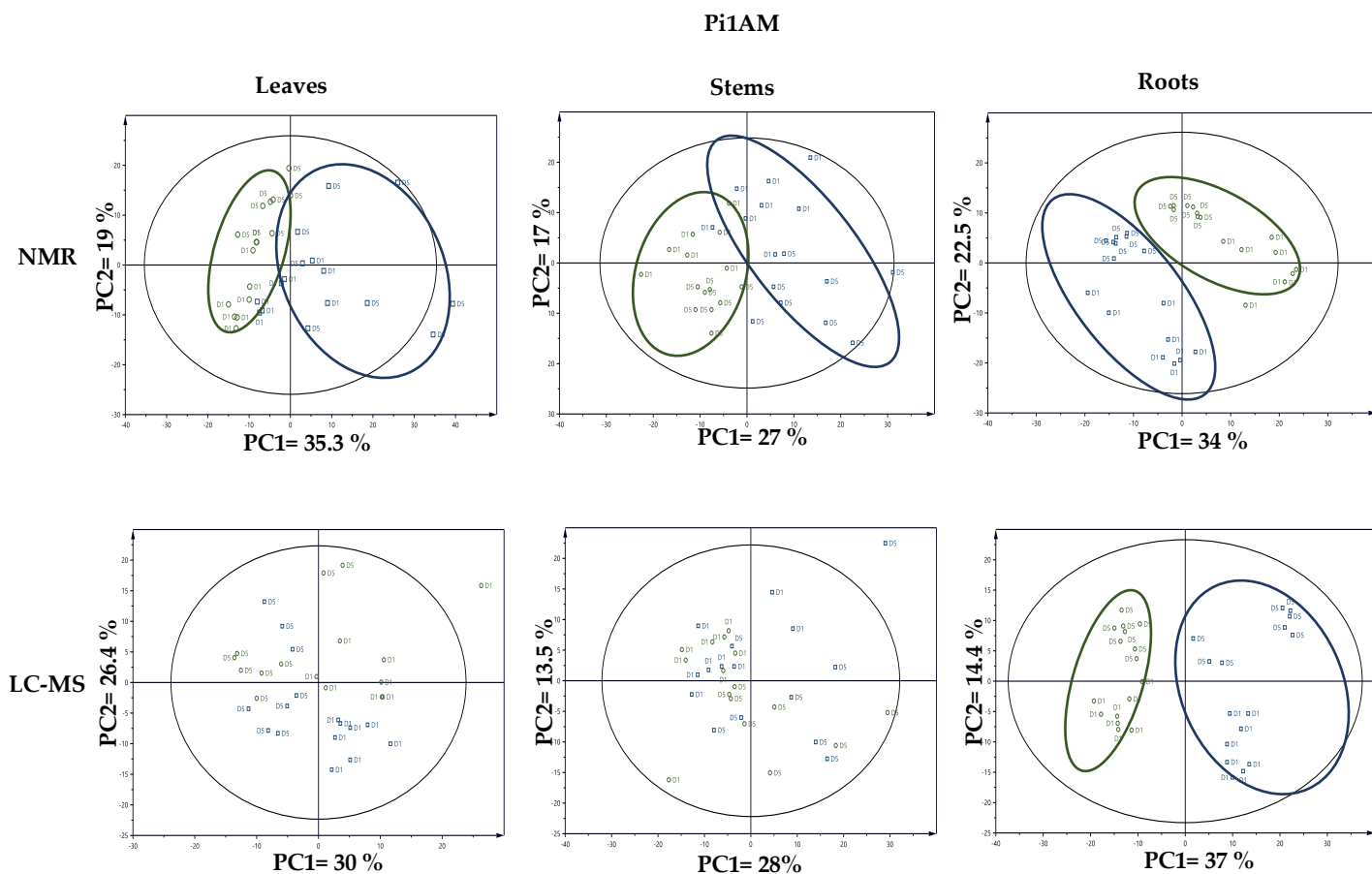


Figure S2. Score plot of principal component analysis (PCA) based on ¹H-NMR and LC-MS data for Pi1AM control or stressed samples in flax roots, stems and leaves.

Supplementary data 4

Table S3. The VIP score and Log10 (Ratio Pi1AM/LuT) of the discriminant metabolites between LuT and Pi1AM of different plant part, in stress conditions.

	Roots	VIP score	Log10 (Ratio Pi1AM/LuT)
LC-MS	DCG	1.92485	-
	PMG	1.49995	1.27
	PDG	1.35502	1.1
	Coniferin	1.10447	0.26
	Linamarin	0.97165	0.24
	Lotaustralin	0.95045	0.17
	SMG	1.87131	-1.22
	LMG	1.455905	-0.55
NMR	Coniferyl Al	1.34104	0.74
	Fumaric Acid	1.0525	0.32
	Malic Acid	1.01368	0.30
	Glucose	0.8586	0.25
	Linamarin	0.85165	0.24
	Fructose	0.82681	0.22
	Sucrose	0.74568	0.16
	Formic Acid	0.68257	0.15
	Lotaustralin	0.659256	0.15
	Succinic Acid	0.66465	0.15
	Glycine	0.60701	0.13
	Uridine	0.60254	0.12
	Threonine	0.55691	0.07
	Glutamic Acid	1.0125	-0.3
	Aspartic Acid	0.90697	-0.27
	GABA	0.79855	-0.27
	Tyrosine	0.74521	-0.26
	Glutamine	0.76524	-0.25
	Chicoric Acid	0.70685	-0.14
	Alanine	0.69252	-0.07

	Stems	VIP score	Log10 (Ratio Pi1AM/LuT)
LC-MS	DCG	2.1672	-
	PMG	1.96605	0.62
	PDG	1.5767	0.58
	Coniferin	1.49128	0.55
	Carlinoside	1.4875	0.54
	Lucenin-2	1.39651	0.48
	Orientin	1.32568	0.42
	Neolunistatin	1.01352	0.3
	FAG	1.00635	0.25
	Chlorogenic Acid	0.96665	0.21
	Vitexin	0.902365	0.18
	CAFG	0.901123	0.16
	Vicenin-2	0.90658	0.13
	LMG	2.40246	-0.33
	LDG	1.97926	-0.19
	Triticuside-A	0.8524	-0.09
NMR	Coniferyl Al	1.7112	0.88
	Phenylalanine	1.2135	0.48
	Glucose	1.0536	0.36
	Tyrosine	1.0235	0.3
	Fructose	1.0004	0.27
	Uridine	0.9591	0.21
	Fumaric Acid	0.9135	0.17
	Galactose	0.9069	0.16
	Ethanolamine	0.84231	0.13
	Glycerol	0.78654	0.11

	Leaves	VIP score	Log10 (Ratio Pi1AM/LuT)
LC-MS	DCG	1.95681	-
	PDG	1.35502	1.16
	PMG	1.28474	1.14
	Coniferin	1.082656	0.8
	Chlorogenic Acid	0.8958	0.34
	FAG	0.86235	0.22
	Carlinoside	0.81658	0.17
	Linamarin	0.80658	0.16
	CAFG	0.80569	0.15
	Lucenin-2	0.75052	0.1
	LMG	1.499468	-0.56
	Vitexin	0.90695	-0.18
	Vicenin-2	0.90556	-0.15
	Schaftoside	0.70581	-0.045
NMR	Coniferyl Al	1.74776	0.68
	Glucose	1.09261	0.33
	Choline	1.0569	0.31
	Fructose	1.02364	0.3
	Linamarin	0.91756	0.15
	Glycerol	0.90235	0.13
	Chicoric Acid	0.8654	0.12
	Succinic Acid	0.80231	0.079
	Phenylalanine	1.0235	-0.37
	GABA	1.00568	-0.32
	Threonine	1.00128	-0.32
	Alanine	0.9123	-0.2
	Serine	0.8568	-0.19
	Galactose	0.8165	-0.18