

Supplementary Materials

Free Phenolic Compounds, Antioxidant Capacity and FT-NIR Survey of Debittered *Lupinus mutabilis* Seeds

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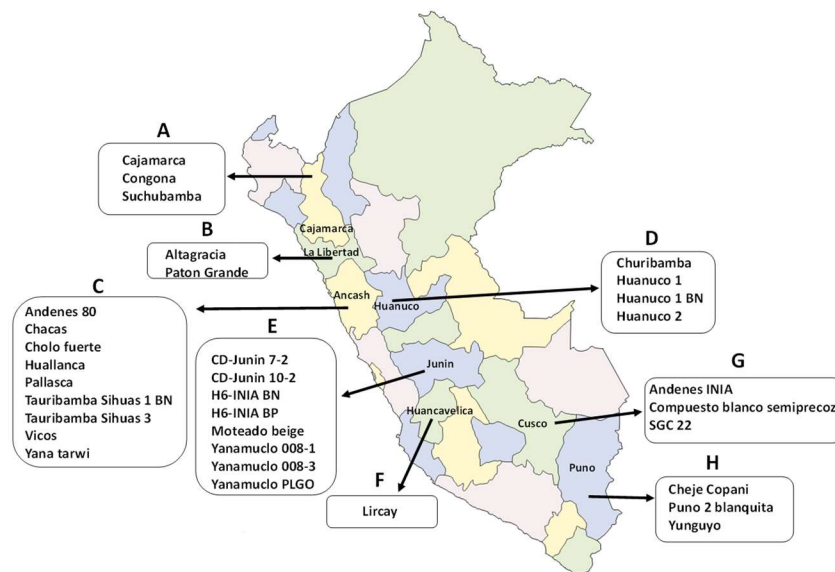


Figure S1. Areas of origin of the 33 *Lupinus mutabilis* ecotypes analysed.

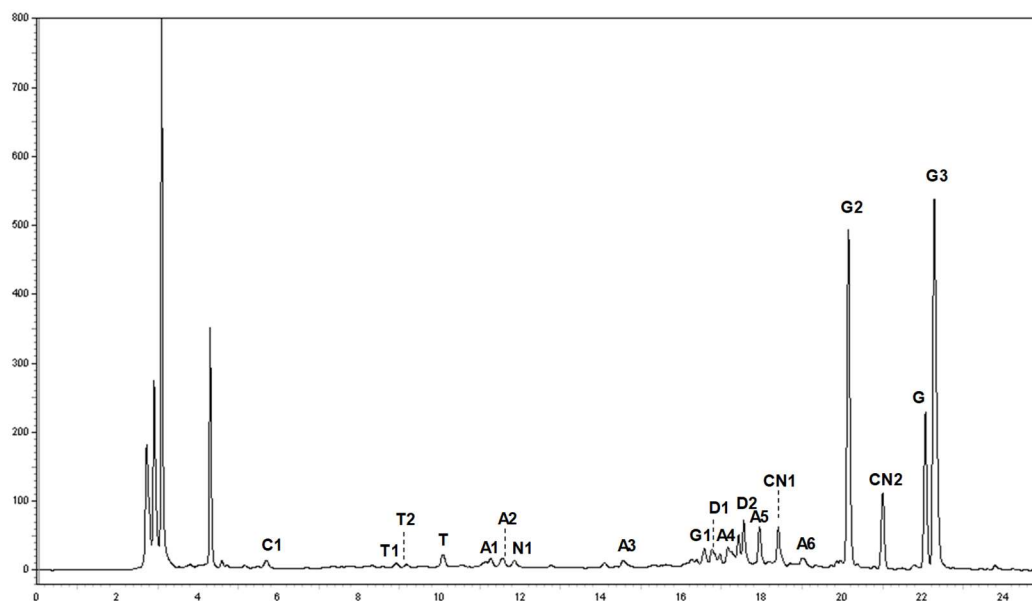


Figure S2. HPLC chromatogram at 280 nm of the free phenolics in one *Lupinus mutabilis* ecotype. A1-A6, apigenin derivatives; C1, catechin derivative; CN1-CN2, cinammic acid derivatives; D1-D2, diosmin derivatives; G, genistein; G1-G3, genistein derivatives; N1, naringenin derivative; T, tyrosol; T1-T2, tyrosol derivative. Apigenin derivatives are read at 320 nm while diosmin derivatives at 360 nm.

Table S1. *Lupinus mutabilis* ecotypes and other *Lupinus* species tested, and their area of origin (see also Figure S1).

	Code	Department	Area
<i>Lupinus mutabilis</i>			
Cajamarca	CAJ	Cajamarca	A
Congona	CON	Cajamarca	A
Suchubamba	SUC	Cajamarca	A
Altagracia	ALG	La Libertad	B
Paton grande	PAG	La Libertad	B
Andenes 80	AND80	Ancash	C
Chacas	CHA	Ancash	C
Cholo fuerte	CHF	Ancash	C
Huallanca	HUAL	Ancash	C
Pallasca	PAL	Ancash	C
Tauribamba Sihuas 1 BN	TS1BN	Ancash	C
Tauribamba Sihuas 3 N	TS3N	Ancash	C
Vicos	VIC	Ancash	C
Yana Tarwi	YAT	Ancash	C
Churibamba	CHU	Huánuco	D
Huanuco 1 BN	HU1BN	Huánuco	D
Huanuco 1	HU1	Huánuco	D
Huanuco 2	HU2	Huánuco	D
CD Junin 7-2	CDJ7-2	Junín	E
CD Junin 10-2	CDJ10-2	Junín	E
H6 INIA BN	H6BN	Junín	E
H6 INIA BP	H6BP	Junín	E
Moteado beige	MOB	Junín	E
Yanamuclo 008-1	YA1	Junín	E
Yanamuclo 008-3	YA3	Junín	E
Yanamuclo PLGO	YAPL	Junín	E
Lircay	LIR	Huancavelica	F
Andenes INIA	ANDIN	Cusco	G
Compuesto blanco semiprecoz	CBSP	Cusco	G
SGC 22	SGC22	Cusco	G
Cheje Copani	CHC	Puno	H
Puno 2 blanquita	PU2B	Puno	H
Yunguyo	YUN	Puno	H

<i>Controls</i>		
<i>L. albus</i> - Dulce 7	<i>albus</i> D	Junín
<i>L. albus</i> - Ares	<i>albus</i> A	Italy
<i>L. albus</i> - Multitalia	<i>albus</i> M	Italy
<i>L. angustifolius</i> - Boregine	<i>angust</i>	Italy
<i>L. luteus</i> - Percoz	<i>luteus</i>	Italy

Table S2. Free phenolics content (mean±sd; mg/kg DM) in debittered seeds of *Lupinus* ecotypes.

	Genistein	Genistein der	Apigenin der*	Catechin der	Diosmin der	Naringeni n der	Tyrosol	Tyrosol der	Cinnamic acid der
<i>Lupinus mutabilis</i>									
Cajamarca	135.0±8.3	497.8±36.6	20.1±3.1	4.5±0.9	84.4±13.3	2.8±0.2	19.4±3.4	nd	1.7±0.0
Congona	56.2±3.6	279.2±5.3	3.9±0.0	nd	43.0±1.7	2.6±0.0	nd	60.3±0.1	5.8±0.1
Suchubamba	72.3±0.7	274.2±9.9	9.2±0.2	nd	138.2±5.9	6.9±0.0	nd	44.9±0.7	5.0±0.1
Altagracia	166.8±2.9	456.2±4.7	21.6±0.7	nd	69.5±9.2	7.2±0.1	13.8±0.1	24.5±0.7	1.0±0.1
Paton grande	101.5±1.6	430.7±8.1	15.1±0.1	14.7±0.9	44.0±0.8	4.1±0.3	11.9±0.1	3.6±0.2	nd
Andenes 80	203.0±33.1	527.0±97.2	28.0±3.3	nd	71.9±7.0	11.2±0.2	25.6±4.6	46.9±2.1	2.6±0.1
Chacas	314.4±6.7	946.8±13.3	3.3±0.1	nd	7.2±0.3	8.0±0.4	nd	51.9±0.3	10.9±0.1
Cholo fuerte	93.3±3.6	316.1±4.5	11.9±1.1	6.5±0.6	70.3±6.1	7.6±0.2	13.4±3.8	11.8±1.3	1.3±0.0
Huallanca	118.7±11.5	409.7±35.5	17.4±0.3	7.1±0.4	95.0±5.8	3.0±0.4	nd	nd	2.5±0.1
Pallasca	50.6±2.1	356.9±0.4	5.0±0.1	nd	42.5±0.8	9.5±0.0	nd	26.8±0.6	6.6±0.2
Tauribamba Sihuas 1 BN	167.4±6.5	401.7±5.5	2.7±0.0	nd	25.0±0.0	7.4±0.2	nd	43.8±0.8	7.9±0.1
Tauribamba Sihuas 3 N	160.9±0.3	502.0±19.7	3.0±0.0	nd	16.6±0.5	5.2±0.1	nd	27.0±0.9	5.4±0.0
Vicos	86.9±1.8	296.2±11.6	4.4±0.1	nd	8.8±0.5	11.6±0.3	nd	45.0±0.1	11.1±0.1
Yana Tarwi	68.1±1.8	376.8±12.5	5.9±0.1	nd	62.3±4.5	5.0±0.1	nd	59.0±0.4	10.3±0.1
Churibamba	39.6±0.9	219.6±3.8	6.5±0.3	nd	25.4±0.7	3.8±0.2	nd	45.8±0.9	nd
Huanuco 1 BN	352.1±4.0	430.8±5.0	23.9±0.6	5.5±0.2	168.2±17.6	8.2±0.1	8.6±0.6	nd	1.7±0.3
Huanuco 1	96.2±0.9	383.5±7.7	7.0±0.2	nd	130.3±1.2	3.1±0.1	nd	44.7±0.5	nd
Huanuco 2	334.6±14.3	762.3±32.0	17.2±2.1	8.8±1.6	99.5±10.2	4.0±0.3	29.1±0.4	4.7±0.9	nd
CD Junin 7-2	38.0±2.1	257.6±4.0	3.2±0.1	nd	68.4±0.5	3.7±0.0	nd	37.4±0.3	11.6±0.1
CD Junin 10-2	57.3±5.0	557.3±0.1	7.3±0.3	nd	30.2±0.8	3.4±0.2	nd	16.0±0.1	nd
H6 INIA BN	110.0±11.3	483.0±37.6	15.2±0.6	11.2±0.2	55.8±5.2	5.2±0.4	9.4±0.5	6.3±1.6	2.1±0.1
H6 INIA BP	196.4±0.5	1062.8±24.9	22.9±0.2	11.8±2.0	40.6±1.5	5.5±1.2	25.3±0.7	25.0±3.5	2.9±0.6
Moteado beige	225.1±12.0	857.6±40.6	24.9±2.3	19.2±3.3	79.3±6.5	2.5±0.1	29.0±0.9	33.3±2.9	nd
Yanamuclo 008-1	142.4±5.7	438.4±23.7	10.9±2.4	17.1±2.6	67.2±6.6	5.1±0.1	14.3±1.0	11.4±0.9	2.5±0.1
Yanamuclo 008-3	110.5±4.0	354.8±6.1	13.9±0.0	16.2±0.4	71.2±2.0	5.1±0.1	16.4±0.5	9.1±0.9	nd
Yanamuclo PLGO	61.2±1.7	314.4±13.0	14.7±0.1	16.5±0.4	78.5±6.9	5.2±0.3	13.2±0.1	nd	3.7±0.6
Lircay	293.2±14.2	780.6±31.3	26.5±2.9	nd	64.7±3.3	3.9±0.0	27.4±0.9	23.2±0.9	1.7±0.1
Andenes INIA	132.2±2.7	480.8±5.7	23.2±0.3	nd	72.8±2.6	5.5±0.1	18.6±2.1	19.8±1.5	nd
Comp. blanco semiprecoz	159.3±21.0	616.6±83.8	23.8±1.6	8.2±0.2	58.9±4.4	5.2±0.2	15.4±1.7	nd	1.9±0.0
SGC 22	91.0±1.1	369.4±2.6	3.0±0.1	nd	47.0±1.1	8.1±0.1	nd	29.6±0.3	11.9±0.1
Cheje Copani N	72.4±2.7	282.9±5.4	3.4±0.0	nd	89.1±2.9	nd	nd	36.4±0.5	nd
Puno 2 Blanquita	97.8±6.9	285.8±10.0	17.6±1.8	36.5±2.0	64.4±4.8	4.4±0.3	49.2±5.3	28.8±1.3	1.6±0.1
Yunguyo	76.2±3.1	325.2±2.2	13.1±0.2	17.9±0.4	44.6±1.9	3.1±0.1	32.6±2.7	4.7±0.4	1.5±0.1
	Genistein	Genistein der	Apigenin der	Catechin der	Diosmin der	Naringeni n der	Tyrosol	Tyrosol der	Cinnamic acid der
<i>Controls</i>									
<i>L. albus</i> - Dulce 7	13.3±3.1	4.9±0.8	13.1±0.2	nd	nd	nd	nd	nd	nd
<i>L. albus</i> - Ares	nd	nd	6.8±0.3	nd	nd	nd	nd	nd	nd
<i>L. albus</i> - Multitalia	nd	nd	17.3±0.8	nd	nd	nd	nd	nd	nd
<i>L. angustifolius</i> - Boregine	nd	nd	14.8±2.1	nd	nd	nd	nd	nd	nd
<i>L. luteus</i> - Percoz	40.4±5.5	230.0±19.3	27.8±0.6	nd	98.4±7.7	2.0±0.1	0.0±0.0	49.4±5.8	0.0±0.0

*der, derivative. nd, not detected, i.e. below the detection limit.