

Pleiotropic biological effects of *Lupinus* spp. protein hydrolysates

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Table S1.
Lupin chemical composition.

	Range (%)	Mean (%)
Carbohydrates	5 - 14	8.15
Proteins	31 - 50	38
Lipids	6 - 12	7.7
<i>Saturated</i>	0.6 - 1.3	0.90
<i>Unsaturated</i>	4.68 - 5.40	5.07
ω -3	0.36 - 1.19	0.67
ω -6	2.15 - 2.90	2.42
Fiber	15 - 38	24.6
Ash	3 - 5	4

Range and the mean of the macromolecules present in the principal species of lupine (Arnoldi, Zanoni, Lammi, & Boschin, 2015; Erbaş, Certel, & Uslu, 2005; Rybiński, et al., 2018; Uzun, Arslan, Karhan, & Toker, 2007). Data are expressed in percentage.

Table S2.
Biological effects of *Lupinus mutabilis*

Enzyme	Time	T (°C)	pH	Antihypertensive and hypoglycemic effects	Reference
<i>Dual-layered enterocyte/adipocyte culture system</i>					
Pepsin (P) + Pancreatin (Pa)	1h (P) + 1h (Pa)	37	2 (P) + 7.5 (Pa)	↑DPP-IV activity inhibition ↑GLUT4 translocation ↓Glucose ↓Gluconeogenesis	(Boschin, Scigliuolo, Resta, & Arnoldi, 2014a, 2014b; Muñoz, Luna-Vital, Fornasini, Baldeón, & de Mejia, 2018)

Biological effects observed in *Lupinus mutabilis* protein hydrolysates in in vitro model. †, increase; ‡, decrease; DPP-IV, dipeptidyl peptidase-IV; GLUT, glucose membrane transporter.

Table S3.

Motifs with a demonstrated biological activity present in the sequences of the lupin peptides discussed in this review.

Peptide	Biological effects				
	Antioxidative	Immunomodulating	Antihypertensive	Hypoglycemic	Others
GPETAFLR		GP	AF AFL GP LR	AF ET FL GP LR PE TA	GP
FVPY	--	PY	FVP VP	PY VP	--
IQDKEGIPPDQQR	--	IPP	EG GI IP IPP KE PP	DQ EG GI IP IQ KE PP QD QQ	--
LTFPGSAED	--	PG	FP GS LTF LTFPG PG TF	AE FP LT PG TF	PG
GQEQSHQDEGVIVR	--	--	EG GQ GV IVR VR	EG GV IV QD QE QS SH VI VR	--
LILPKHSDAD	--	--	DA IL ILP LP	AD DA HS IL KH LI LP PK	--
YDFYPSSTKDQQS	KD	--	DF DFY FY ST YP	DQ PS QQ QS TK YD YP	--
LNALEPDNTVQSEAGTIETWNP	TW	--	AG ALEP EA GT IE LN SE	AG AL DN EA EP ET LN NA NP NT PK QS TI TV	--

Table S3 (continued)

Peptide	Biological effects				
	Antioxidative	Immunomodulating	Antihypertensive	Hypoglycemic	Others
				TW VQ WN	
Percentage of the motifs present in the lupin peptides (%)	1.72	3.45	35.34	55.17	4.31

Motifs with a demonstrated biological activity identified in the sequences of the lupin peptides of this review according to BIOPEP-UWM database ([Minkiewicz, Dziuba, Iwaniak, Dziuba, & Darewicz, 2008](#)).

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