

Evaluation of *Phaseolus* and *Vigna* species in the Mediterranean climate: a morphological and chemical analysis

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Table S1. Quantitative morphological characters measured for the 23 *Phaseolus* spp. accessions.

Characters			Accessions																						
Acronym	Name	Unit	PV01CU	PV02CU	PV03CU	PV04CU	PV05HI	PV06MA	PV07MA	PC08MA	PV09MA	PV10MA	PV11ST	PL12ST	PL13ST	PV14ST	PL15ST	PL16ST	PL17ST	PV18MP	PV20SO	PV21SO	PV23SO	PV24SO	PV25SO
LL	Leaflet length	mm	78.1	83.6	75.1	75.0	78.6	77.1		62.6	71.3	53.1	75.6	60.0	50.0	72.6		83.4	59.7	83.7	84.5	73.8	85.5	74.0	88.5
HL	Hypocotyl length	mm	1.5	1.6			2.5	2.3		2.4	2.3		2.2		1.4	1.8		1.9		2.1	1.9				0.6
DTM	Days to maturity	count	68	83	80					71	74	77	80			81					68	76	78	70	68
PH	Plant height	cm	50	25	26	20	23	20	28	21	26	17.5	45	30	140	45		35	200	16	15	24	16	28	25
SD	Stem diameter	mm	4	4	6	5	6	5	5	4	4	5	5	10	9.2	6		7	8.5	3.5	4	5	5	6	5
NNMS	Node no. at the main stem	count	3	5	4	5	5	3	3	2	4	3	5	18		6				3	2	4	4	4	4
NNH	Node no. at harvest	count	3	5	4	5	5	3	3	2	4	3	5	20		6	10		5	3	2	4	4	4	4
DTF	Days to flowering	count	22	22	31	46	24	25	40	25	27	30	42		210	42	210		131	33	24	28	30	20	20
FBPI	Flower buds per inflorescence	count	3	4	3		3	4	3	3	3	3	3	20	10.4	2	15.5			3	3	3	2	2	4
RPP	Racemes per plant	count	11	9	6		6	4	4	5	5	4	7	10	15	9	6		30	5	6	8	6	10	7
IL	Inflorescence length	mm	25	45	32		30	35		40	27	40	25	200	170	40	115			30	35	38	28	55	30
PEL	Pedicle length	mm	7	8	4		10	14		7	8	9	5	130	12	6	4.4			10	9	7	10	12	10
DOF	Duration of flowering	days	69	42	33		21	31	8	21	16	38	27			30				14	16	37	40	65	45
POL	Pod length	mm	95	110	120		120	110	95	90	120	95	110	108.6	67.3	115	74.3		70	95	110	130	110	120	120
PW	Pod width	mm	13	11	13		12	9	10	9	11	11	10	58	41.6	12	47.5		15	8	9	10	11	15	14
LPP	Locules per pod	count	5	4	5		5	4	6	4	4	4	6	4	4	6			2.5	3	3	5	3.5	4	4.5
PBL	Pod beak length	mm	10	18	11		13	15	7	9	14	13	11	3.2	8.5	14	4.4		3	16	19	18	19	20	10
PPP	Pods per plant	count	9	6	5		7	6	6.5	5	5	7	6			7			120	2	3	6	4	11	7
TNHS	Total harvested seeds	count	348	124	204		95	124	114	176	152	104	203	235	68	221			161	53	82	34	37	59	252
WTHS	Weight of total harvested seeds	g	91.4	32.7	61.9		28.8	32.7	19.5	45.6	55.4	27.2	33.2	127.1	20.5	43.7			64.4	20.0	27.7	9.5	11.6	27.2	86.8
WTS	Weight of ten harvested seeds	g	2.6	2.9	2.9		2.9	2.6	1.7	2.5	3.3	2.6	1.7	5.4	3.0	1.9			4	4.1	3.5	2.6	3.5	4.8	3.3
SL	Seed length	mm	10.8	12.1	13.2		14.5	14.0	10.5	13.8	14.2	12.6	10.8	15.9		11.1			14.1	16.1	15.3	14.1	15.0	15.1	13.8
SH	Seed height	mm	7.1	6.8	7.5		7.0	6.4	6.6	6.5	7.3	6.9	6.2	11.4		6.6			9.9	7.2	6.9	6.5	7.6	7.6	7.1
SW	Seed width	mm	5.9	5.7	4.9		5.0	5.6	3.9	5.6	5.4	5.3	3.7	4.4		4.4			5.1	5.2	4.8	5.0	5.0	5.9	5.2

Table S2. Correlation matrix between quantitative morphological characters measured for the 19 *Phaseolus* spp. accessions.

Spearman	LL	PH	SD	NNMS	NNH	DTF	FBPI	RPP	IL	PEL	DOF	POL	PW	LPP	PBL	PPP	TNHS	WTHS	WTS	SL	SH	SW
LL	1																					
PH	-0.42	1																				
SD	-0.38	0.47*	1																			
NNMS	-0.12	0.53*	0.63*	1																		
NNH	-0.15	0.56*	0.65*	1.00	1																	
DTF	-0.52*	0.31	0.39	0.32	0.35	1																
FBPI	-0.10	0.14	0.09	0.15	0.17	0.08	1															
RPP	-0.02	0.65*	0.39	0.58*	0.60*	-0.01	0.13	1														
IL	-0.54*	0.17	0.45	0.14	0.17	0.20	0.23	0.19	1													
PEL	-0.04	-0.06	0.30	-0.01	0.02	0.07	0.39	-0.04	0.47*	1												
DOF	0.14	0.21	0.21	0.20	0.20	-0.42	0.03	0.56*	0.04	-0.07	1											
POL	0.30	-0.06	0.21	0.35	0.32	-0.37	-0.27	0.09	-0.23	-0.28	0.20	1										
PW	-0.22	0.63*	0.70*	0.59*	0.61*	0.01	0.16	0.69*	0.26	0.20	0.59*	0.19	1									
LPP	-0.07	0.45	0.21	0.28	0.24	0.05	-0.23	0.03	-0.17	-0.45	0.01	0.36	0.10	1								
PBL	0.47*	-0.55*	-0.30	-0.11	-0.14	-0.42	-0.51*	-0.09	-0.14	-0.14	0.13	0.48*	-0.33	-0.26	1							
PPP	-0.43	0.68*	0.66*	0.45	0.47*	0.05	0.28	0.59*	0.45	0.36	0.45	-0.10	0.77*	0.22	-0.46*	1						
TNHS	-0.20	0.64*	0.19	0.26	0.27	0.11	0.38	0.34	-0.08	-0.23	0.18	-0.15	0.47*	0.37	-0.70*	0.41	1					
WTHS	-0.21	0.57*	0.21	0.29	0.31	0.04	0.51*	0.43	-0.06	-0.10	0.19	-0.13	0.56*	0.07	-0.64*	0.41	0.92*	1				
WTS	0.18	-0.15	0.16	0.14	0.17	-0.09	0.20	0.32	0.17	0.52*	0.18	0.07	0.39	-0.73*	0.23	0.06	-0.22	0.10	1			
SL	0.17	-0.44	0.08	0.01	0.03	-0.04	0.04	0.04	0.08	0.47*	-0.14	0.15	0.03	-0.70*	0.37	-0.18	-0.47*	-0.16	0.85*	1		
SH	-0.04	0.15	0.35	0.24	0.28	0.01	0.07	0.37	0.12	0.41	0.28	-0.02	0.67*	-0.49*	-0.09	0.25	0.06	0.30	0.83*	0.55*	1	
SW	0.07	-0.13	-0.41	-0.35	-0.35	-0.67*	0.08	0.06	-0.03	0.03	0.50*	-0.10	0.06	-0.37	0.21	0.08	-0.02	0.11	0.19	0.04	0.13	1

Significance: * $p \leq 0.05$

Table S3. Qualitative morphological characters assessed for the 23 *Phaseolus* spp. accessions.

Acronym	Name	Coding Key	PV0	PV0	PV0	PV0	PV0	PV0	PV0	PC0	PV0	PV1	PV1	PL12	PL13	PV1	PL15	PL16	PL17	PV1	PV2	PV2	PV2	PV2	PV2
PT	Plant type	(2) indeterminate bush with erect branches, (4) indeterminate with semi-climbing main stem and branches, (5) indeterminate with moderate climbing ability and pods distributed evenly up the plant, (6) indeterminate with aggressive climbing ability and pods mainly on the upper node of the plant	2	6	2	2	2	2	2	2	2	2	2	6	5	2	6	5	4	2		2	2	2	5
HP	Hypocotyl pigmentation	(1) purple, (2) red	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	1	2	2	2
ECC	Emerging cotyledon colour	(3) green, (5) very pale green	5	5	5	5	3	5	5	5	5	3	5	5	5	5	5	3	3	5	3	3	3	5	3
LCA	Leaf colour anthocyanin	(0) absent, (1) present	1	0	0	0		1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
LCC	Leaf colour chlorophyll	(3) pale green, (5) medium green, (7) dark green	5	5	5	5		5	5	5	5	5	5	5	5	3	5	5	7	5		5	5	5	7
LS	Leaf shape	(1) triangular, (2) quadrangular, (3) round	1	2	2	2	1	2	2	2	3	2	2	2	1	2	2	2	1	2	2	2	2	2	2
LP	Leaf persistence	(3) all leaves dropped, (5) intermediate	3	5	3	3						5		3			3					3	3	3	5
FBS	Flower bud size	(3) small, (5) medium, (7) large	5	5	3	5	3	5	5	5		3	5	5	3	5	5		3	3		3	5	5	7
SHOB	Shape of bracteole	(3) lanceolate, (5) intermediate, (7) ovate	5	5	3	3	3	3	3	3		5	5	3	7	3	3	3	3	3		3	3	5	5
SOB	Size of bracteole	(3) small, (5) medium	3	5	5	3	5	5	5	3		5	5	5	3	5	5	5	3	5		5	3	5	5
BCLR	Bracteole/Calyx length relation	(3) $\leq$ calyx, (5) 1/3 longer, (7) $2 \times$ calyx	3	3	3	3	3	3	3	3		3	3	3	7	3	3		3	3		3	3	3	3
BCC	Calyx/Bracteole colour	(1) green, (2) pale violet	1	1	1	1	1	1	1	1		2	1	1	1	1	1		1	1		1	1	1	1
WO	Wing opening	(3) parallel closed wings, (5) wings moderately diverging, (7) wings widely diverging	3	5	5	5		5	5	7		5	3	5	5	7	7		5	5		5	5	5	3
SP	Style protrusion	(0) not protruding, (1) protruding	0	1	1	1		0	0	0		0	0	1	0	1	1		1	1		0	0	0	0
POP	Position of pods	(1) base, (2) centre, (3) top, (4) combination of 1, 2 and 3	4	4	4	3		3	3	1		3	3	4		3	2		4	3		3	1	3	4
PCS	Pod cross-section	(1) very flat, (2) pear shaped, (3) round elliptic	3	2	3	3		3	3	2		2	3	1		2	2	1	2	3		3	3	3	3

PC	Pod curvature	(3) straight, (5) slightly curved, (7) curved	5	3	5	7	5	5	5	7	7	5	3	5	7	5	3	7	3	5		
PWF	Pod wall fibre	(5) leathery podded, (7) excessive shattering	5		5		5	5		5	5	5	5		7	5	5	5	5	5		
PBP	Pod beak position	(1) marginal, (2) non-marginal	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2		
PBO	Pod beak orientation	(3) upward, (5) straight, (7) downward	7	7	3	7	3	3	7	7	7	7	7	7	3	3	5	5	5	5		
COS	Colour of standard	(1) white, (3) lilac, (4) white with lilac edge, (6) dark lilac with purple outer edge	3	1	4	1	3	1		3			1	1	1	1	3	1	1	6	3	
COW	Colour of wings	(1) white, (3) lilac, (8)purple	3	1	3	1	1	1		3		1	1	1	1	1		1	1	1	8	1
PCI	Pod colour immature	(4) carmine stripe on green, (5) pale red stripe on green, (7) normal green	4	7	7	7	5	5	7	7	7		7	7	7	7	7	7	7	7	7	
PCAPM	Pod colour at physiological maturity	(3) pink, (4) yellow, (5) pale yellow with coloured mottling or stripes, (6) persistent green;	5	4	5	4	5	5		5	5	3	4	6	6	4	4	4	4	4	4	
DPC	Dry pod colour	(10) golden or deep yellow, (11) pale yellow to white	10	10	10	11	11	10	10	11	10	10	10	10	10	11	11	10	11	11	11	
SCP	Seed coat patterns	(0) absent, (2) stripped, (3) rhomboid spotted, (9) spotted bicolor, (10) pattern around hilum	2	10	10	3	2	2	2	2	9	0	10	0	9	0	0	0	0	0		
SCDC	Seed coat darker colour	(1) black, (2) pale to dark brown, (3) maroon, (4) brownish to greenish grey, (12) red, (14) purple	12	1	4	2	12	2	2	1	14	3	1	3	2	2	2	2	2	3		
SCLC	Seed coat lighter colour	(2) pale to dark brown, (3) maroon, (5) yellow to greenish, (6) pale-cream to buff, (8) whitish	6	5	8	6	6	6	6	6	6	3	2	3	6	6	6	4	6	3		
BOS	Brilliance of seed	(5) medium, (7) shiny	5	5	5	5	5	5	5	5	5	5	5	7	5	5	5	5	5	7		
SDSH	Seed shape	(2) oval, (3) cuboid, (4) kidney shaped, (5) truncate fastigiate	2	2	2	3	4	4	3	4	4	5	5	4	5	5	4	4	4	4		
ASV	Apparent seed veining	(0) absent, (1) present	0	1	1	1	1	0	1	0	0	1	1	1	0	1	1	1	1	0		

Table S4. Quantitative morphological characters measured for the 15 *Vigna unguiculata* accessions.

Characters			Accessions														
Acronym	Name	Unit	VU01MA	VU02MA	VU03HI	VU04NA	VU05CC	VU06MO	VU07BE	VU08BI	VU09UI	VU11LU	VU12ST	VU14ST	VU16MP	VU17SO	VU18MP
TLL	Terminal leaflet length	cm	9.0	9.1	7.1	8.0	8.1	7.3	8.7	8.6	6.2	7.5	7.7	9.9	6.6	8.2	9.0
TLW	Terminal leaflet width	cm	4.0	5.7	3.1	4.1	5.1	4.6	6.0	6.0	3.2	4.0	4.1	6.0	3.8	4.5	5.0
SL	Stipule length	mm	10	10	7	12	12	11	11	12	9	11	11	14	10	11	12
SW	Stipule width	mm	4	3	3	4	7	5	5	4	3	5	4	5	4	4	5
NMB	No. of main branches	count	3	4	4	4	5	4	3	3	2	2	3	4	2	2	3
NNMS	No. of nodes in the main stem	count	6	8	8	10	11	9	8	8	8	8	6	7	5	6	6
DTF	Days to flowering	count	64	76				72	77			102	71	67			73
DTFMP	Days to first mature pod	count	77			101		97	101			99	100	100			
PL	Pod length	cm	16.5	16.5				15.8	18			18	17	17			20
NLPP	No. of locules per pod	count	16	12				16	17			16	16	16			15
DOF	Duration of flowering	count	8					6	10				6	7			5
STL	Standart length	mm						17	15				20	16	24		22
CLL	Calyx lobe length	mm						3	3				4		18		5
PDL	Peduncle length	mm						15	11				17	11	14		16
NPPP	No. of pods per peduncle	count		2		2		3	2				2	2			2
NPPPL	No. of pods per plant	count				23		15					4				
PW	Pod width	mm	8			12		9	12			10	10	10			12
NSPP	No. of Seeds per pod	count		6.7	15.5	16.3			7.3			15.3	12.1	10.0	16.3		13.3
NTHS	No. of Total harvested seeds	count		107	170	1126			573			614	386	451	49		799
WHS	Weight of ten harvested seeds	g	0.9	1.3	2	1			1.7			1.6	1.4	1.1	1.9		1.6
SLE	Seed length	mm	7.8	8.5	8.9	7.4		6.9	8.6			8.4	8.4	9.0			9.9
SWI	Seed width	mm	6.0	6.5	6.8	5.7		6.4	7.9			6.4	6.3	7.5			7.9
ST	Seed thickness	mm	4.2	4.7	4.9	4.1		4.6	6.0			5.1	5.0	4.7			5.1

Table S5. Correlation matrix between morphological characters measured for the nine *Vigna unguiculata* accessions.

Spearman	TLL	TLW	SL	SW	NMB	NNMS	DTF	DTFMP	PL	NLPP	NPPP	PW	NSPP	NTHS	WHS	SLE	SWI	ST
TLL	1																	
TLW	0.53	1																
SL	0.11	0.33	1															
SW	-0.22	0.26	0.53	1														
NMB	0.28	0.46	0.22	-0.27	1													
NNMS	-0.40	0.08	0.08	0.04	0.48	1												
DTF	-0.28	0.09	-0.08	0.15	-0.26	0.53	1											
DTFMP	-0.23	0.28	0.52	0.21	0.11	0.45	0.31	1										
PL	0.02	0.09	0.49	0.43	-0.56	-0.14	0.51	0.36	1									
NLPP	-0.33	0.02	-0.03	0.49	-0.37	-0.04	-0.07	0.42	0.02	1								
NPPP	-0.56	-0.56	-0.39	0.24	-0.18	0.18	-0.11	-0.43	-0.44	0.29	1							
PW	0.20	0.46	0.41	0.04	0.05	0.23	0.59	0.47	0.71*	-0.32	-0.75*	1						
NSPP	-0.49	-0.68	0.34	0.19	-0.25	0.19	0.08	0.03	0.34	-0.17	0.34	0.03	1					
NTHS	-0.31	-0.26	0.45	0.41	-0.28	0.29	0.36	0.25	0.67	-0.02	0.07	0.46	0.80*	1				
WHS	-0.37	0.29	0.08	0.64	-0.48	0.05	0.64	0.20	0.56	0.29	-0.01	0.38	-0.08	0.24	1			
SLE	0.65	0.62	0.34	0.34	-0.22	-0.47	0.17	-0.02	0.60	-0.11	-0.60	0.48	-0.37	-0.03	0.40	1		
SWI	0.41	0.72*	0.26	0.56	-0.15	-0.24	0.30	-0.05	0.48	0	-0.35	0.43	-0.42	-0.02	0.67*	0.88*	1	
ST	0	0.36	0.03	0.45	-0.60	-0.31	0.52	0.11	0.65	0.22	-0.30	0.43	-0.29	0.04	0.88*	0.70*	0.78*	1

Significance: * $p \leq 0.05$

Table S6. Qualitative morphological characters assessed for the 15 *Vigna unguiculata* accessions.

Character			Accessions															
Acro nym	Name	Coding Key	VU0	VU0	VU0	VU0	VU0	VU0	VU0	VU0	VU0	VU0	VU0	VU1	VU1	VU1	VU1	VU1
PP	Plant pigmentation	(0) none, (3) moderate at the base and tips of petioles, (5) intermediate, (7) extensive	3	3	3	5	3	3	0	3			5		7	0	5	5
TLS	Terminal leaflet shape	(2) sub-globose, (3) sub-hastate, (4) hastate	4	3	4	2	2	3	2	3			3	4	3	3	4	3
PH	Plant hairiness	(3) glabrescent, (5) short appressed hairs	5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
LC	Leaf colour	(5) intermediate green, (7) dark green	5	5	5	5	5	5	7	5	7	5	7	7	5	5	5	5
LT	Leaf texture	(2) intermediate	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
GH	Growth habit	(1) acute erect , (2) erect, (3) semi-erect, (4) intermediate	2	2	4	4	4	4	2	4	4	2	3	1	3	2	1	
GP	Growth pattern	(1) determinate, (2) indeterminate	1	2		2		2	2				2	1	1			1
TWT	Twinning tendency	(0) none, (3) slight	3	0	0	3	0	3	3	3	0	0	3	0	0	0	0	0
PV	Plant vigour	(3) non-vigorous, (5) intermediate	3	5	3	3	5	3	3	3	3	3	3	3	5	3	3	3
RP	Raceme position	(2) in upper canopy, (3) throughout canopy	2	2				3	3				2	2	2			3
PAT	Pod attachment to the peduncle	(3) pendant, (5) 30 – 90° down from erect	3	3				5	5				5	3	3			3
IPP	Immature pod pigmentation	(0) none, (1) pigmented tips, (3) pigmented valves with green sutures, (4) splashes of pigment, (5) uniformly pigmented	3	4				0	0				3	5	3			1
PC	Pod curvature	(0) straight, (3) slightly curved, (5) curved	3	3		3		3	0				0	3	3			5
FPP	Flowering pigment pattern	(0) not pigmented (white), (1) wing pigmented, standard with light V-shaped pattern of pigment at top center, (3) wing pigmented, standard lightly pigmented, (5) completely pigmented						5	1	0			5	3		0		5
FC	Flower colour	(1) white, (2) violet, (3) mauve-pink		2				2	2	1			2	2	2	1		3
PWT	Pod wall thickness	(3) thin, (5) intermediate, (7) thick	3			5		5	7				5	5	5			7
SSH	Seed shape	(2) ovoid, (3) crowded, (4) globose, (5) rhomboid	2	2	5	5		4	3				2	2	5			2
TT	Testa texture	(1) smooth, (3) smooth to rough	1	3	1	3		1	1				1	1	1			3
EP	Eye pattern	(0) absent, (2) Kabba group, (3) Narrow eye, (4) Small eye, (5) Holstein group, (6) Watson group	6	2	3	6		0	6				3	4	3			5
EC	Eye colour	(0) eye absent, (1) brown splash or grey, (2) Tan brown, (6) blue to black spots or mottle	1	6	2	1		0	1				1	2	2			1
SC	Seed crowding	(0) not crowded, (3) crowded, (7) extremely crowded	3	3	3	3		3	5				3	0	3			0
LM	Leaf marking	(0) absent, (1) present	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOT	Splitting of testa	(0) absent, (1) present	0	1	0	0		0	0				0	0	0			0
AOT	Attachment of testa	(0) not firmly attached, (1) firmly attached	1	0	1	1		0	0				1	0	1			0

Table S7. Average values¹ (in mg/kg ww) and homogeneous groups² for the mineral content of 18 *Phaseolus* spp. and 10 *Vigna unguiculata* accessions.

Accession	Na	K	Ca	Mg	P	S	Fe	Cu	Zn	Mn	B
PV01CU	10.1 defg	13487.6 ijk	2073.6 a	1514.5 gh	4228.0 k	2666.9 d	117.8 h	9.3 hi	33.7 j	11.0 f	9.9 b
PV02CU	20.4 abc	15110.6 de	1891.6 c	1892.6 a	4988.7 f	2951.2 b	143.0 f	10.9 c	36.5 f	12.1 c	9.9 b
PV03CU	10.6 defg	15082.9 de	1709.4 e	1555.3 fg	4762.8 h	2677.4 d	132.3 g	11.0 bc	42.0 ab	10.2 g	9.3 ef
PV05HI	25.9 ab	14561.9 fg	1364.3 fg	1622.3 cd	4816.6 gh	2805.6 cd	187.5 b	10.5 de	34.3 i	11.7 d	10.0 b
PV06MA	14.8 cd	15033.9 de	1245.7 hi	1711.4 b	5177.1 de	2923.1 bc	102.3 j	10.9 c	41.3 bc	10.7 e	9.3 ef
PV07MA	11.4 defg	15699.4 ab	1391.5 f	1932.9 a	5383.1 ab	2977.1 b	87.7 p	10.7 cd	35.7 g	10.5 f	8.7 g
PC08MA	14.1 cdef	14882.0 ef	2082.7 a	1603.4 de	4457.0 i	2565.2 ef	90.8 no	8.4 j	29.8 lm	10.5 f	9.6 cd
PV09MA	7.6 g	16092.0 a	1970.8 b	1586.7 def	5238.8 cd	3143.8 a	90.2 o	11.3 ab	33.9 j	9.3 ij	10.5 a
PV10MA	14.8 cde	15462.9 bc	1706.3 e	1567.8 ef	5073.5 ef	3147.9 a	156.0 d	12.0 a	36.2 fg	11.1 d	10.5 a
PV11ST	17.4 bc	15044.9 e	2016.3 b	1907.3 a	5516.6 a	3068.2 a	181.3 c	9.9 ef	42.8 a	12.3 bc	9.4 e
PL14ST	9.2 efg	15298.3 cd	1979.8 b	1651.1 bc	5302.9 bc	3101.3 a	93.7 m	10.1 e	39.1 de	11.2 d	9.5 de
PL17ST	8.9 fg	14313.8 gh	664.5 k	1476.2 hi	2977.3 m	2077.5 i	154.6 d	6.9 j	35.0 h	15.6 a	12.1 a
PV18MP	24.2 ab	12723.4 k	1080.9 ij	1408.3 j	4418.3 ij	2525.8 fg	146.6 e	9.1 i	30.9 kl	12.4 ab	9.6 cd
PV20SO	25.5 ab	13621.1 ij	1009.9 jk	1501.0 h	4382.6 j	2595.0 e	111.4 i	9.1 i	37.1 e	10.7 e	7.8 g
PV21SO	26.8 a	15560.5 abc	1761.3 d	1631.0 bc	4865.3 g	2476.4 g	240.0 a	9.6 fg	39.8 bc	11.2 d	10.7 a
PV23SO	25.6 ab	14381.0 gh	1734.3 de	1387.5 jk	4184.1 kl	2523.8 fg	96.2 l	9.4 gh	32.7 k	10.0 gh	9.8 bc
PV24SO	19.9 abc	12980.2 jk	2093.8 a	1356.8 k	4084.6 lm	2134.2 hi	99.9 k	8.5 j	29.5 m	9.9 hi	9.7 bc
PV25SO	11.4 defg	13991.4 hi	1322.0 gh	1422.3 ij	4745.0 h	2269.0 h	91.0 n	9.4 gh	33.9 ij	7.9 j	9.9 fg
Mean ± stDev ³	16.6 ± 7.4	14649.5 ± 941.0	1616.6 ± 415.5	1596.5 ± 170.9	4700.3 ± 596.8	2701.6 ± 330.7	129.0 ± 41.4	9.8 ± 1.2	35.8 ± 3.9	11.0 ± 1.5	9.7 ± 0.9
Accession	Na	K	Ca	Mg	P	S	Fe	Cu	Zn	Mn	B
VU01MA	64.9 b	12397.6 ef	768.5 c	1776.8 ab	3825.3 e	2185.3 e	58.3 i	8.0 ab	38.3 e	14.8 b	13.7 e
VU02MA	45.1 cd	13725.3 b	667.4 ef	1631.1 ef	3801.5 e	2760.6 a	65.6 g	7.3 cd	37.9 e	13.5 cd	12.6 f
VU03HI	47.8 c	12399.5 ef	735.2 d	1651.9 de	3129.7 h	2502.5 d	61.3 h	8.7 a	30.9 f	9.2 e	16.6 c
VU04NA	88.1 a	12937.3 de	706.8 de	1758.9 b	3584.2 g	2498.4 d	75.1 e	7.5 bcd	48.8 a	13.5 c	17.4 ab
VU06MO	84.4 a	13360.7 c	880.2 a	1963.8 a	4590.0 a	2547.2 c	100.9 c	7.5 bc	47.7 ab	14.7 b	14.9 d
VU07BE	60.1 b	13738.6 ab	773.6 c	1730.2 bc	4148.1 c	2190.4 e	60.8 h	6.2 e	44.2 c	12.6 de	16.4 c
VU11LU	85.1 a	12112.8 f	765.6 c	1590.7 fg	4365.8 b	2627.3 c	162.4 a	6.9 de	44.0 c	13.8 c	19.6 a
VU12ST	40.6 cd	13079.5 d	796.0 ab	1583.5 g	3697.4 f	2694.9 b	84.6 d	7.6 abc	44.9 b	15.2 a	13.1 e
VU14ST	61.2 b	13467.6 bc	783.3 bc	1686.8 cd	4061.7 d	2678.5 b	73.8 f	7.3 cd	43.8 c	15.2 a	13.0 ef
VU16MP	40.0 d	14132.0 a	629.6 f	1638.3 e	4089.3 d	2466.6 d	138.2 b	7.1 de	42.5 d	15.6 a	17.0 bc
Mean ± stDev ³	61.7 ± 18.1	13135.1 ± 657.2	750.6 ± 68.2	1701.1 ± 111.3	3929.3 ± 395.5	2515.2 ± 188.7	88.1 ± 33.9	7.4 ± 0.7	42.3 ± 5.0	13.8 ± 1.8	15.4 ± 2.2

¹Average values of three different determinations (n=3); ²**Homogeneous groups:** accessions sharing one or more letters for each mineral are not statistically different according to the Kruskal-Wallis test (p < 0.05); ³Standard deviation.

Table S8. Comparison¹ of the average mineral content (mg/Kg ww) of seeds between the same accessions of *Phaseolus vulgaris* and *Vigna unguiculata* grown in the Mediterranean (Med) and sub-Saharan Africa (SSA).

Accession	Species	Na_S SA	Na_Med	K SSA	K_Med	Ca_S SA	Ca_Med	Mg_S SA	Mg_Med	P_S SA	P_Med	S_S SA	S_Med	Fe_S SA	Fe_Med	Cu_S SA	Cu_Med	Zn_S SA	Zn_Med	Mn_Med	Mn_S SA	B_S SA	B_Med
PV01	<i>Phaseolus vulgaris</i>	11.0	190.7	1348	8626	2073.	1249.	1514.	1640.	422	3119	266	1798	117.8	68.9	9.3	8.2	33.7	24.3	28.3	10.5	9.9	2.4
CU				7.6	.0	6	2	5	6	8.0	.9	6.9	.0										
PV02	<i>Phaseolus vulgaris</i>	20.4	120.9	1511	1069	1891.	1244.	1892.	1804.	498	4059	295	1573	143.0	62.2	10.9	7.2	36.5	24.7	18.5	12.1	9.9	7.5
CU				0.6	1.7	6	8	6	6	8.7	.3	1.2	.0										
PV03	<i>Phaseolus vulgaris</i>	10.6	169.6	1508	9241	1709.	933.5	1555.	1703.	476	3878	267	2021	132.3	56.1	11.0	8.8	42.0	24.6	18.5	10.2	9.3	3.9
CU				5.9	.0	4		3	3	2.8	.7	7.4	.2										
PV05	<i>Phaseolus vulgaris</i>	25.9	123.2	1456	1096	1364.	1446.	1622.	1766.	481	3853	280	1974	187.5	72.6	10.5	7.3	34.3	28.3	18.5	11.3	10.0	7.7
HI				1.9	9.4	3	5	3	8	6.6	.6	5.6	.7										
PV06	<i>Phaseolus vulgaris</i>	14.8	168.9	1503	9379	1245.	1379.	1711.	1536.	517	3278	292	1544	102.3	67.4	10.9	6.9	41.3	22.5	21.8	10.7	9.3	3.4
MA				3.9	.5	7	6	4	8	7.0	.7	3.1	.6										
PV07	<i>Phaseolus vulgaris</i>	11.4	106.8	1569	1044	1391.	1536.	1932.	1906.	538	3814	297	1875	87.7	49.0	10.7	8.0	35.7	21.9	22.6	10.5	8.7	9.4
MA				9.4	9.8	5	9	9	4	6.1	.9	7.1	.4										
PV09	<i>Phaseolus vulgaris</i>	7.6	197.1	1609	1049	1970.	1319.	1586.	1811.	523	3908	314	1874	90.2	58.7	11.3	10.0	33.9	26.0	24.7	9.3	10.5	2.8
MA				2.0	3.3	8	5	7	8	8.1	.6	3.8	.9										
PV10	<i>Phaseolus vulgaris</i>	14.8	147.8	1546	1042	1706.	1040.	1567.	1768.	507	4196	314	1732	156.0	53.0	12.0	7.7	36.2	23.4	25.6	11.1	10.5	3.5
MA				2.9	1.6	3	9	8	8	3.5	.0	7.9	.8										
PV11	<i>Phaseolus vulgaris</i>	17.4	118.2	1504	1156	2016.	1384.	1907.	1777.	551	4544	306	1817	181.3	72.4	9.9	6.5	42.8	23.5	14.5	12.3	9.4	8.1
ST				4.2	3.9	3	7	3	8	6.6	.1	8.2	.9										
PV14	<i>Phaseolus vulgaris</i>	9.2	136.3	1529	1184	1978.	1452.	1651.	1818.	530	4196	310	1901	93.7	79.5	10.2	6.8	39.1	19.9	17.9	11.1	9.4	5.9
ST				8.3	5.5	8	4	1	9	2.9	.5	1.3	.6										
PV18	<i>Phaseolus vulgaris</i>	24.2	260.4	1272	1050	1080.	1063.	1408.	1710.	441	4863	252	1783	146.2	64.7	9.1	8.1	30.9	31.9	15.3	12.4	9.6	5.9
MP				3.4	6.7	9	0	3	0	8.3	.9	5.8	.1										
PV20	<i>Phaseolus vulgaris</i>	25.5	121.2	1362	9338	1009.	1006.	1501.	1515.	438	3943	259	1501	111.4	50.6	9.1	6.8	37.1	21.8	13.8	10.7	7.8	5.8
SO				1.1	.8	9	3	0	3	2.6	.4	5.0	.4										
PV21	<i>Phaseolus vulgaris</i>	26.8	152.5	1556	8646	1761.	1158.	1640.	1670.	486	4712	247	1377	239.9	70.5	9.6	8.0	39.8	24.0	20.5	11.2	10.7	4.8
SO				0.5	.5	3	2	0	5	5.3	.5	6.4	.7										
PV23	<i>Phaseolus vulgaris</i>	25.6	161.0	1438	8749	1734.	1384.	1387.	1602.	418	4389	252	1530	96.2	73.6	9.4	7.5	32.7	27.1	20.5	10.0	9.8	1.7
SO				1.0	.1	3	7	5	1	4.1	.0	3.8	.6										
PV24	<i>Phaseolus vulgaris</i>	19.9	185.0	1298	9121	2093.	964.3	1356.	1492.	408	4260	213	1564	99.9	66.1	8.5	7.0	29.5	22.9	21.1	9.9	9.7	3.8
SO				0.2	.7	8		8	5	4.6	.3	4.2	.1										
PV25	<i>Phaseolus vulgaris</i>	11.4	109.2	1399	1045	1322.	1067.	1422.	1726.	474	5210	226	1571	91.0	68.0	9.4	8.0	33.9	25.7	15.9	7.9	8.9	7.5
SO				1.4	3.0	0	1	3	0	5.0	.8	9.0	.4										
VU01	<i>Vigna unguiculata</i>	190.4	64.9	9969.	1239	852.6	768.5	2210.	1776.	449	3825	172	2185	54.0	58.3	6.1	8.0	26.0	38.3	14.8	28.8	6.8	13.7
MA				7	7.6			0	8	3.8	.3	0.6	.3										

VU02	Vigna	109.5	45.1	1065	1372			2088.	1631.	453	3801	205	2760										
MA	unguiculata			6.3	5.3	720.2	667.6	4	1	3.3	.5	2.8	.6	42.2	65.5	5.3	7.3	28.4	37.9	13.5	20.7	14.3	12.6
VU03	Vigna	194.4	47.8	1022	1239			2169.	1651.	470	3129	191	2502										
HI	unguiculata			2.5	9.5	717.1	735.2	4	9	6.5	.7	8.9	.5	78.0	61.3	7.3	8.7	28.2	30.9	9.2	38.0	9.0	16.6
VU04	Vigna	234.4	88.1	1000	1293	1006.		2086.	1758.	511	3584	189	2498										
NA	unguiculata			9.7	7.3	0	706.8	7	4	7.9	.2	6.3	.4	55.4	75.1	6.8	7.5	35.8	48.8	13.5	22.4	11.1	17.4
VU06	Vigna			9090.	1336			2148.	1963.	349	4590	187	2547										
MO	unguiculata	177.6	84.4	8	0.7	829.9	880.2	3	8	3.9	.0	3.6	.2	49.6	100.9	6.4	7.5	28.7	47.7	14.7	22.1	10.2	14.9
VU07	Vigna			1019	1373			1938.	1730.	408	4148	192	2190										
BE	unguiculata	155.8	60.1	3.1	8.6	849.5	773.6	7	2	4.8	.1	6.5	.4	52.4	60.8	6.8	6.2	38.5	44.2	12.6	28.4	8.7	16.4
VU11	Vigna			1045	1211			2037.	1590.	454	4365	184	2627										
LU	unguiculata	252.2	85.1	8.8	2.8	924.2	765.6	6	7	3.6	.8	9.9	.3	58.0	162.4	8.2	6.9	36.1	44.0	13.8	23.0	7.5	19.6
VU12	Vigna			9768.	1307			1935.	1583.	511	3697	195	2694										
ST	unguiculata	171.2	40.6	3	9.5	796.3	796.0	2	5	6.1	.4	0.8	.9	52.9	84.6	4.6	7.5	29.8	44.9	15.2	14.7	11.6	13.1
VU14	Vigna			1028	1346			2016.	1686.	401	4061	195	2678										
ST	unguiculata	169.3	61.3	0.4	7.6	908.2	783.3	8	8	9.3	.7	8.3	.5	52.4	73.8	5.5	7.3	22.3	43.8	15.2	18.2	8.4	13.0
VU18	Vigna			9730.	1413			1925.	1638.	393	4089	186	2466										
MP	unguiculata	171.9	40.0	3	2.0	851.4	629.6	4	3	6.5	.3	7.6	.6	49.4	138.2	5.8	7.1	29.1	42.5	15.6	21.0	10.4	17.0

¹The highlighted values indicate that the landraces grown in Mediterranean conditions present higher mineral values.