

Electronic supplementary materials**Title:**

Enzymatic and quantitative properties of Rubisco in C₃ herbaceous plants with early-spring persistent leaves and some alpine plants

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Content:

Fig. S1

	10	20	30	40	50
<i>Oryza sativa</i>	MSPQTETKASVGFKAGVKDYKLTYTPEYETKDTDILAAFRVTPQPGVPP				
<i>Hordeum vulgare</i>	G...Q.....S.....				
<i>Spinacia oleracea</i>	L.....S.....				
<i>Adonis ramosa</i>	P...T.....				
<i>Taraxacum officinale</i>	D.....				
<i>Lunaria annua</i>	E.....				
<i>Symphytum officinale</i>	E.....				
<i>Tradescantia virginiana</i>	Q.....				
<i>Vinca major</i>	E.....				

	60	70	80	90	100
<i>Oryza sativa</i>	EEAGAAVAAESSTGTWTTVWTDGLTSLDRYKGRCHIEPVVGEDNQYIAY				
<i>Hordeum vulgare</i>	A...S.W.C.				
<i>Spinacia oleracea</i>	N.....A.E...C.				
<i>Adonis ramosa</i>	A.E...C.				
<i>Taraxacum officinale</i>	G...P..ES.F...				
<i>Lunaria annua</i>	P..ET.F...				
<i>Symphytum officinale</i>	DA.P..E...C.				
<i>Tradescantia virginiana</i>	P..ET.F...				
<i>Vinca major</i>	P..ED.F...				

	110	120	130	140	150
<i>Oryza sativa</i>	VAYPLDLFEEGSVTNMFTSIVGNVFGFKALRALRLEDLRIPTYSKTFQG				
<i>Hordeum vulgare</i>	.....				
<i>Spinacia oleracea</i>	VA.V....				
<i>Adonis ramosa</i>	VA.I....				
<i>Taraxacum officinale</i>	VA.V....				
<i>Lunaria annua</i>	A.....A.T....				
<i>Symphytum officinale</i>	TA.V....				
<i>Tradescantia virginiana</i>	VA.T...A.				
<i>Vinca major</i>	A.I....				

	160	170	180	190	200
<i>Oryza sativa</i>	PPHGIQVERDKLNKYGRPLLGTIKPKLGLSAKNYGRACYECIRGGDLFT				
<i>Hordeum vulgare</i>	.....				
<i>Spinacia oleracea</i>	V.....				
<i>Adonis ramosa</i>	V.....				
<i>Taraxacum officinale</i>	V.....				
<i>Lunaria annua</i>	V.....				
<i>Symphytum officinale</i>	A.....V.....				
<i>Tradescantia virginiana</i>	V.....				
<i>Vinca major</i>	.....				

	210	220	230	240	250
<i>Oryza sativa</i>	....|....|....|....|....|....|....|....|....|....|	KDDENVNSQPFMRWRDRFVFC	AEAIYKSQAETGEIKGHYLN	NATAGTCEEM	
<i>Hordeum vulgare</i>	.....	.....	.....	.....	.....
<i>Spinacia oleracea</i>	.....	L.....L..A.....	D.		
<i>Adonis ramosa</i>	.....	L.....A.....			
<i>Taraxacum officinale</i>	.....	L.....F.....			
<i>Lunaria annua</i>	.....	L.....			
<i>Symphytum officinale</i>	.....	L.....L..A.....	N.D.		
<i>Tradescantia virginiana</i>	.....	L.....			
<i>Vinca major</i>	.....	L.....A.....			
	260	270	280	290	300
<i>Oryza sativa</i>	....|....|....|....|....|....|....|....|....|....|	IKRAVFARELGVPIVMHDYLT	GGFTANTSLAHYCRDNGLL	LHIHRAMHAV	
<i>Hordeum vulgare</i>	.....	.....	T.....		
<i>Spinacia oleracea</i>	M.....	.....	T.S.....		
<i>Adonis ramosa</i>	.....	.....	.....		
<i>Taraxacum officinale</i>	M...I.....	.....	T.....		
<i>Lunaria annua</i>	.....	.....	.....		
<i>Symphytum officinale</i>	M.....	.....	T..S.....		
<i>Tradescantia virginiana</i>	L...QC.....	.....	Y.....		
<i>Vinca major</i>	M...I.....	.....	.....		
	310	320	330	340	350
<i>Oryza sativa</i>	....|....|....|....|....|....|....|....|....|....|	IDRQKNHGMHFRVLAKALR	MSGGDHIHAGTVVGKLEGE	REMTLGFVDLLR	
<i>Hordeum vulgare</i>	.....	.....	S.....		
<i>Spinacia oleracea</i>	.....	L.....S.....	DI.....		
<i>Adonis ramosa</i>	.....	.....	I.....		
<i>Taraxacum officinale</i>	.....	I.....S.....	I.....		
<i>Lunaria annua</i>	.....	L.....D..S.....			
<i>Symphytum officinale</i>	.....	.....	NI.....		
<i>Tradescantia virginiana</i>	.....	.....	I.....		
<i>Vinca major</i>	.....	I.....S.....	DI.....		
	360	370	380	390	400
<i>Oryza sativa</i>	....|....|....|....|....|....|....|....|....|....|	DDFIEKDRARGIFFTQDWV	SMPGVIPVASGGIHVWHM	PALTEIFGDDSVL	
<i>Hordeum vulgare</i>	.....	.....	.....		
<i>Spinacia oleracea</i>	..YT...S...Y...S...T...L.....				
<i>Adonis ramosa</i>	..Y.A...S...Y.....L...L.....				
<i>Taraxacum officinale</i>	S...Y.....L...L.....				
<i>Lunaria annua</i>	..YV...S.....L...L.....				
<i>Symphytum officinale</i>	T...Y.....L...L.....	V.....			
<i>Tradescantia virginiana</i>	...V...S.....L.....				
<i>Vinca major</i>	.E.....S...Y.....L...L.....				

	410	420	430	440	450
<i>Oryza sativa</i>	QFGGGT	LGHPWGNAPGAAANRVALEACVQARNEGRDLAREGNEI	IRSACK		
<i>Hordeum vulgare</i>				A	
<i>Spinacia oleracea</i>		V		T	E.T.
<i>Adonis ramosa</i>		V			E
<i>Taraxacum officinale</i>		V		T	Q.E.T.
<i>Lunaria annua</i>		V		V	E
<i>Symphytum officinale</i>		V	V	GD	V.E.T.
<i>Tradescantia virginiana</i>		V			E.A.
<i>Vinca major</i>		V		V	E

	460	470
<i>Oryza sativa</i>	WSPELAAACEIWKAIKFEFEPVDKLD	--
<i>Hordeum vulgare</i>	V	TI.KKV
<i>Spinacia oleracea</i>	V	E.PAM.TV----
<i>Adonis ramosa</i>	L	V.E.AM.T.----
<i>Taraxacum officinale</i>	V	E.AM.TI----
<i>Lunaria annua</i>	V	E.R.N.PTI...GQE
<i>Symphytum officinale</i>	V	E.T.T.E...Y--
<i>Tradescantia virginiana</i>	V	TV.KV-
<i>Vinca major</i>	V	E.T.N.KA..T.----

Fig. S1 Alignment of amino acid sequences of RbcL in plants used in this study, which are available from public databases. Accession numbers of RbcL proteins (GenBank for *Symphytum officinale* and *Tradescantia virginiana*, and NCBI Reference Sequence for the other plant species) are for NP_039391.1 for *Oryza sativa*, P_05698.2 for *Hordeum vulgare*, NP_054944.1 for *Spinacia oleracea*, YP_010719200.1 for *Adonis ramosae*, YP_009271390.1 for *Taraxacum officinale*, YP_009897810.1 for *Lunaria annua*, XMH33909.1 for *Symphytum officinale*, QUB02768.1 for *Tradescantia virginiana*, and YP_010437102.1 for *Vinca major*. The alignment was performed by the ClustalW algorithm (Thompson et al. (1994) Nucl Acids Res 22:4673– 4680) using BioEdit (version 7.2.5; Hall (1999) Nucl Acids Symp Ser 41:95–98) with the default parameters. Full-length amino acid sequences for the other plant species are unavailable.