

Supplementary Material:

Efficient *in vivo* screening method for the identification of C₄ photosynthesis inhibitors based on cell suspensions of the single-cell C₄ plant *Bienertia sinuspersici*

1 SUPPLEMENTARY DATA

Sequences used for the alignments are (UniProt identifiers if not stated otherwise): Bs (*Bienertia sinuspersici*, PEPC: GenBank ABG20459.1, PPKD: GenBank GCEP01054245.1/GCEP01053558.1), Ft (*Flaveria trinervia*, PEPC: P30694, PPKD: P22221), So (*Saccharum officinarum*, PEPC: Q9FS96, PPKD: Q9SNY6), Sb (*Sorghum bicolor*, PEPC: P15804, PPKD: Q84N32), Zm (*Zea mays*, PEPC: P04711, PPKD: P11155), Ah (*Amaranthus hypochondriacus*, PEPC: E2JE39, PPKD: F8UU33), Ec (*Echinochloa crus-galli*, PEPC: Q52NW0, PPKD: Q4JIY1), Si (*Setaria italica*, PEPC: Q8S2Z8, PPKD: A0A290Y0Z5).

1.1 Multiple Sequence Alignment of PEPC

		10	20	30	40					
Ah	MA	----SGKL	EKMA	SIDAQLR	LLAP	PKVSEDDKL	VEYDALL	LD	DRFLD	ILE
Bs	MA	----SGKL	EKMA	SIDAQLR	ALAP	PKVSEDDKL	VEYDALL	LD	DRFLD	SVQ
Ft	MA	----NRNV	EKLA	SIDAQLR	LLVP	PKVSEDDKL	VEYDALL	LD	DKFLD	IILQ
Ec	MA	-----S	ERHQ	SIDAQLR	LLAP	PKVSEDDKL	VEYDALL	LD	DRFLD	IILQ
Sb	MA	-----S	ERHH	SIDAQLR	ALAP	PKVSE	EE--LIQ	YDALLV	DRFLD	IILQ
Si	MA	----SKPV	EKHH	SIDAQLR	LLAP	PKVSEDDKL	VEYDALL	LD	DRFLD	IFQ
So	MA	-----S	ERHH	SIDAQLR	ALAP	PKVSE	EE--LIQ	YDALLV	DRFLD	IILQ
Zm	MA	STKAPGPG	EKHH	SIDAQLR	QLVP	PKVSEDDKL	IEYDALLV	DRFL	NILQ	

	50	60	70	80	90						
Ah	SLHGS	GIRET	VQELYE	HAAEYER	THD	TKKLE	EELGNL	ITSL	DAGDS	IIVIAK	
Bs	ALHGEE	IRET	VQGLYE	HAAEYER	TRD	TKKLE	EELGDM	LIRL	DAGDS	IIVIAK	
Ft	DLHGED	LKEAV	QOCYELS	AEYEGKH	DPK	KKLE	EELGSL	LTSL	LDTGDS	IIVIAK	
Ec	DLHGPN	LREFV	QECYELS	AEYDRDH	ASK	LS	ELGSKL	TGLA	PADA	ILVAS	
Sb	DLHGPS	LREFV	QECYEV	SADYEGK	KD	TS	KL	GELGAK	LTGLA	PADA	ILVAS
Si	DLHGPN	IREFV	QECYEV	AAEYER	DRD	AAK	LS	ELGSRL	TKL	SPNDA	IIVAS
So	DLHGPN	LREFV	QECYEV	SADYEGK	KD	TS	KL	GELGAK	LTGLA	PADA	ILVAS
Zm	DLHGPN	LREFV	QECYEV	SADYEGK	GD	TT	KL	GELGAK	LTGLA	PADA	ILVAS

	100	110	120	130	140							
Ah	SFS	QMLNLANL	AEEVQLAY	RRRIK	KTKK	GDFADE	SSAI	TESD	FEET	LRRL		
Bs	SFS	HMLILANL	AEEVQIAY	RRRIK	NLKK	GDFADE	SSAI	TESD	LEET	LRRL		
Ft	AFS	HMLNLANL	AEEVQIAY	RRRI	-KLKS	GDFADE	ANAT	TESD	IEET	FKRL		
Ec	SFS	HMLNLANL	AEEVQIAQ	RRRN	-KLKR	GDF	TDEGSAL	TESD	IEET	LKRL		
Sb	SIL	HMLNLANL	AEEVQLAH	RRRN	S	KLKH	GDFS	DEGSAT	TESD	IEET	LKRL	
Si	SFS	NMLNLANL	AEEVQLAH	LRRN	-KLKR	GDF	FADE	GF	AATESD	IEET	LKRL	
So	SIL	HMLNLANL	AEEVQLAH	RRRN	S	KLKH	GDFS	DEGSAT	TESD	IEET	LKRL	
Zm	SIL	HMLNLANL	AEEVQIAH	RRRN	S	KLK	KG	FADE	GSAT	TESD	IEET	LKRL

	150	160	170	180	190									
Ah	V-DL	KESPEE	IFAT	LKNQ	TVDLV	LTAHPTQS	VRRS	LLOKH	HGR	RIRD	CL	SQ	L	
Bs	VVDL	KKESPEE	IFET	LKNQ	TVELV	LTAHPTQS	VRRS	LLOKH	HGR	RIRD	CL	TQ	L	
Ft	VHKL	NKSPEE	VFD	DALKNQ	TVELV	LTAHPTQS	VRRS	LLOKH	HGR	RIRN	CL	AQ	L	
Ec	VTDL	GKTK	KEE	VFD	DALKNQ	TVELV	MTAHPTQS	VRRS	LLOKH	YS	RIRN	CL	TEL	
Sb	VS-LGKT	PAE	VFE	ALKNQ	SVDLV	F	TAHPTQS	A	RRS	LLOKH	NA	RIRN	CL	TQ
Si	VTEL	GKS	KEE	VFD	DALKNQ	TVDLV	F	TAHPTQS	VRRS	LLOKH	HA	RIRN	CL	TQ
So	VS-LGKT	PEE	VFE	ALKNQ	SVDLV	F	TAHPTQS	A	RRS	LLOKH	NA	RIRN	CL	TQ
Zm	VSEV	GKSPEE	VFE	ALKNQ	TVDLV	F	TAHPTQS	A	RRS	LLOKH	NA	RIRN	CL	TQ

	200	210	220	230	240																							
Ah	YAKD	I	TP	DDK	QELDEAL	QRE	IQA	AFRT	DE	IRR	V	O	PT	PQ	DEM	R	M	G	M	S	Y	F	H	E				
Bs	YAKD	I	TP	DDK	QELDEAL	QRE	IQA	AFRT	DE	IRR	M	O	PT	PQ	DEM	R	A	G	M	S	Y	F	H	E				
Ft	YAKD	I	TP	DDK	QELDEAL	H	RE	IQA	AFRT	DE	IRR	T	P	P	T	PQ	DEM	R	A	G	M	S	Y	F	H	E		
Ec	YAKD	I	S	A	DDK	KELDEAL	QRE	IQA	AFRT	DE	IRRA	Q	P	T	PQ	DEM	R	Y	G	M	S	Y	F	H	E			
Sb	SAKD	V	T	V	E	D	K	KELDEAL	H	RE	IQA	AFRT	DE	IRRA	Q	P	T	PQ	DEM	R	Y	G	M	S	Y	I	H	E
Si	YAKD	N	T	E	DDK	QELDEAL	QRE	IQA	C	FRT	DE	IRRA	Q	P	T	PQ	DEM	R	Y	G	M	S	Y	F	H	E		
So	ST	KD	V	T	V	E	D	K	KELDEAL	QRE	IQA	AFRT	DE	IRRA	Q	P	T	PQ	DEM	R	Y	G	M	S	Y	I	H	E
Zm	NA	KD	I	T	D	DDK	QELDEAL	QRE	IQA	AFRT	DE	IRRA	Q	P	T	PQ	A	E	M	R	Y	G	M	S	Y	I	H	E

	250	260	270	280	290																																														
Ah	T	I	W	K	G	V	P	K	F	L	R	R	V	D	T	A	L	K	N	I	G	I	N	E	R	V	P	Y	N	V	P	L	I	Q	F	S	S	W	M	G	G	D	R	D	G	N	P	R	V	T	
Bs	T	I	W	K	G	V	P	K	F	L	R	R	L	D	T	A	L	K	N	I	G	I	N	E	R	V	P	Y	N	A	P	L	I	Q	F	S	S	S	W	M	G	G	D	R	D	G	N	P	R	V	T
Ft	T	I	W	K	G	V	P	K	F	L	R	R	V	D	T	A	L	K	N	I	G	I	N	E	R	F	P	Y	N	A	P	L	I	Q	F	S	S	W	M	G	G	D	R	D	G	N	P	R	V	T	
Ec	T	I	W	K	G	V	P	K	F	L	R	R	V	D	T	A	L	K	N	I	G	I	N	E	R	L	P	Y	N	V	P	L	I	K	F	S	S	W	M	G	G	D	R	D	G	N	P	R	V	T	
Sb	T	V	W	N	G	V	P	K	F	L	R	R	V	D	T	A	L	K	N	I	G	I	N	E	R	L	P	Y	D	V	P	L	I	K	F	C	S	W	M	G	G	D	R	D	G	N	P	R	V	T	
Si	T	I	W	K	G	V	P	K	F	L	R	R	V	D	T	A	L	K	N	I	G	I	N	E	R	L	P	Y	N	A	P	L	I	Q	F	S	S	W	M	G	G	D	R	D	G	N	P	R	V	T	
So	T	V	W	K	G	V	P	K	F	L	R	R	V	D	T	A	L	K	N	I	G	I	N	O	R	L	P	Y	N	V	P	L	I	K	F	C	S	W	M	G	G	D	R	D	G	N	P	R	V	T	
Zm	T	V	W	K	G	V	P	K	F	L	R	R	V	D	T	A	L	K	N	I	G	I	N	E	R	L	P	Y	N	V	S	L	I	R	F	S	S	W	M	G	G	D	R	D	G	N	P	R	V	T	

	300	310	320	330	340																																								
Ah	PEVTR	DV	V	L	L	A	R	M	M	A	A	N	M	Y	F	T	Q	I	T	D	L	M	F	E	L	S	M	W	R	C	N	D	E	V	R	A	R	A	Q	E	L	R	S	Q	-
Bs	PEVTR	DV	V	L	L	A	R	M	M	A	A	N	M	Y	F	S	Q	I	Q	D	L	M	F	E	L	S	M	W	R	C	N	D	E	L	N	A	R	A	H	E	I	H	K	L	-
Ft	PEVTR	DV	C	L	L	A	R	M	M	T	S	N	M	Y	F	S	Q	I	E	D	L	M	I	E	M	S	M	W	R	C	N	S	E	L	R	V	R	A	E	E	L	Y	R	T	-
Ec	PEVTR	DV	C	L	L	A	R	M	M	A	A	N	L	Y	F	S	Q	I	E	D	L	M	F	E	L	S	M	W	R	C	N	D	E	L	R	A	R	A	D	E	L	L	D	S	A
Sb	PEVTR	DV	C	L	L	S	R	M	M	A	A	N	L	Y	I	N	Q	V	E	D	L	M	F	E	L	S	M	W	R	C	N	D	E	L	R	A	R	A	E	E	V	Q	S	T	P
Si	PEVTR	DV	C	L	L	A	R	M	M	A	S	N	L	Y	F	S	R	I	E	E	L	M	F	E	L	S	M	W	R	C	N	D	E	L	R	A	R	A	E	E	L	H	A	S	-
So	PEVTR	DV	C	L	L	S	R	M	M	A	A	N	L	Y	I	D	Q	V	E	D	L	M	F	E	L	S	M	W	R	C	N	D	E	L	R	A	R	A	E	E	V	Q	S	T	P
Zm	PEVTR	DV	C	L	L	A	R	M	M	A	A	N	L	Y	I	D	Q	I	E	E	L	M	F	E	L	S	M	W	R	C	N	D	E	L	R	V	R	A	E	E	L	H	S	S	S

	350	360	370	380	390																																											
Ah	-SK	S	D	A	K	H	Y	I	E	F	W	K	O	I	P	L	S	E	P	Y	R	V	I	L	G	D	V	R	D	K	L	Y	N	T	R	E	H	A	H	Q	L	L	A	N	G	A	S	D
Bs	-SK	S	D	A	K	H	Y	I	E	F	W	K	P	I	P	P	S	E	P	Y	R	V	V	L	A	D	V	R	D	K	L	Y	H	T	R	E	H	A	R	Q	L	L	S	N	G	T	S	D
Ft	-AR	K	D	V	K	H	Y	I	E	F	W	K	R	I	P	P	N	Q	P	Y	R	V	I	L	G	D	V	R	D	K	L	Y	N	T	R	E	R	S	R	H	L	L	V	D	G	K	S	D
Ec	SK	K	T	A	N	K	H	Y	I	E	F	W	R	G	I	P	P	N	E	P	Y	R	V	L	G	Y	V	R	D	K	L	Y	N	T	R	E	R	S	R	H	L	L	T	S	G	F	S	E
Sb	A	S	K	K	V	T	K	Y	I	E	F	W	K	O	I	P	P	N	E	P	Y	R	V	L	G	A	V	R	D	K	L	Y	N	T	R	E	R	S	R	H	L	L	A	T	G	F	S	E
Si	-S	Q	R	I	S	K	H	Y	I	E	F	W	R	O	L	P	A	N	E	P	Y	R	V	L	G	Y	V	R	D	E	L	Y	S	T	R	E	R	S	R	H	L	L	T	S	G	F	S	D
So	A	S	K	K	V	T	K	Y	I	E	F	W	K	O	I	P	P	N	E	P	Y	R	V	L	G	A	V	R	D	K	L	Y	N	T	R	E	R	S	R	H	L	L	A	T	G	F	S	E
Zm	G	S	-	K	V	T	K	Y	I	E	F	W	K	O	I	P	P	N	E	P	Y	R	V	L	G	H	V	R	D	K	L	Y	N	T	R	E	R	S	R	H	L	L	A	S	G	V	S	E

	400	410	420	430	440																																													
Ah	V	P	E	E	S	T	F	T	H	I	D	Q	F	L	E	P	L	E	L	C	Y	K	S	L	C	A	S	G	D	R	P	I	A	D	G	S	L	L	D	F	M	R	Q	V	S	T	F	G	L	S
Bs	V	P	L	E	S	T	F	T	H	V	D	Q	F	L	E	P	L	E	L	C	Y	K	S	L	C	D	C	G	D	R	P	I	A	D	G	S	L	L	D	F	M	R	Q	V	S	T	F	G	L	C
Ft	I	P	D	E	A	V	Y	T	N	V	E	Q	L	L	E	P	L	E	L	C	Y	R	S	L	C	D	C	G	D	H	V	I	A	D	G	S	L	L	D	F	L	R	Q	V	S	T	F	G	L	S
Ec	I	T	E	D	L	V	F	T	N	I	E	E	F	L	E	P	L	E	L	C	Y	K	S	L	C	E	C	G	D	K	I	V	A	D	G	S	L	L	D	F	L	R	Q	V	S	T	F	G	L	S
Sb	I	S	E	D	A	V	F	T	K	I	E	E	F	L	E	P	L	E	L	C	Y	K	S	L	C	E	C	G	D	K	A	I	A	D	G	S	L	L	D	L	L	R	Q	V	F	T	F	G	L	S
Si	I	P	E	D	S	A	F	K	N	V	E	E	F	L	E	P	L	E	L	C	Y	K	S	L	C	D	C	G	D	K	T	I	A	D	G	S	L	L	D	F	M	R	Q	V	S	T	F	G	L	S
So	I	S	V	D	S	V	F	T	N	I	E	E	F	L	E	P	L	E	L	C	Y	K	S	L	C	D	C	G	D	K	A	I	A	D	G	S	L	L	D	L	L	R	Q	V	F	T	F	G	L	S
Zm	I	S	A	E	S	S	F	T	S	I	E	E	F	L	E	P	L	E	L	C	Y	K	S	L	C	D	C	G	D	K	A	I	A	D	G	S	L	L	D	L	L	R	Q	V	F	T	F	G	L	S

	450	460	470	480	490
Ah	L VKLD I RQES D R H T E V M D A I T T H L G I G S Y R S W S E E K R Q E W L L S E L R G K R P				
Bs	L VKLD I RQES E R H T D V M D A I T K H L G V G S Y R E W S E E K R Q E W L L S E L R G T R P				
Ft	L VKLD I RQES D R H T E V L D A I T Q H L G I G S Y R E W S E E K R Q E W L L A E L S G K R P				
Ec	F VKLD I RQES E R H T D A I D A I T T H L G I G S Y K S W P E E K R Q E W L L S E L Q G K R P				
Sb	L VKLD I RQES E R Q T D V I D A I T T H L G I G S Y R S W P E D K R M E W L V S E L K G K R P				
Si	M VKLD I RQES E R H T D V I D A I T T H L G I G S Y R E W S E E K R Q E W L L S E L R G K R P				
So	L VKLD I RQES E R H T D V I D A I T T Y L G I G S Y R S W P E D K R M E W L V S E L K G K R P				
Zm	L VKLD I RQES E R H T D V I D A I T T H L G I G S Y R E W P E D K R Q E W L L S E L R G K R P				

	500	510	520	530	540
Ah	L F G S D I P M S Y E V A D A I G T F R V L A E L P N D S F G A Y I I S M A T A P S D V L A V E L L				
Bs	L F G S D I P K T E E I A A V I D T F H V I S E L P S D G F G A Y I I S M A T A P S D V L A V E L L				
Ft	L I G P D I P K T E E V K D C L D T F K V L A E L P S D C F G A Y I I S M A T S T S D V L A V E L L				
Ec	L L T P D P P T S D E V A D V L G C F R V L A E L P R D S F G P Y I I S M A T A P S D V P A V E L L				
Sb	L L P P D I P M T E E I A D V I G A M R V L A E L P I D S F G P Y I I S M C T A P S D V L A V E L L				
Si	L L S K D M P Q T E E I A D V L G C F H V L A E L P R D S F G P Y I I S M A T A P S D V L A V E L L				
So	L L P P D I P M T E E I A D V I G A M H V L A E L P S D S F G P Y I I S M C T A P S D V L A V E L L				
Zm	L L P P D I P Q T D E I A D V I G A F H V L A E L P P D S F G P Y I I S M A T A P S D V L A V E L L				

	550	560	570	580	590
Ah	Q R E C G I K K P L R V V P L F E K L A D L Q S A A A S M T R L F S I D W Y K N R I N G T Q E V M I				
Bs	Q R E C H I Q N P L R V V P L F E K L A D L E N A P A S I T R L F S I D W Y R N R I N G K Q E V M I				
Ft	Q R E Y H I K H P L R V V P L F E K L A D L E A A P A A M T R L F S M D W Y R N R I D G K Q E V M I				
Ec	Q R E C Q I K D P L P V V P L F E R L A D L R A G P A S V E R L F S T E W Y L K R I N G K Q O V M V				
Sb	Q R E C G I R Q T L P V V P L F E R L A D L Q A A P A S V E K L F S T D W Y I N H I N G K Q O V M V				
Si	Q R E C H V K Q P L P V V P L F E K L A D L Q S A P A S I E R L F S L D W Y M N R I G G K Q O V M V				
So	Q R E C G I R Q T L P V V P L F E R L A D L Q A A P A S V E R L F S T D W Y F D H I K G K Q O V M V				
Zm	Q R E C G V R Q P L P V V P L F E R L A D L Q S A P A S V E R L F S V D W Y M D R I K G K Q O V M V				

	600	610	620	630	640
Ah	G Y S D S G K D A G R L S A A W Q L Y K V Q E Q L I Q V A K E Y G V K L T M F H G R G G T V G R G G				
Bs	G Y S D S G K D A G R L S A A W Q L Y K A Q E E L I K I A K E F G V K L T M F H G R G G T V G R G G				
Ft	G Y S D S G K D A G R F S A A W Q L Y K T Q E Q I V K I A K E F G V K L V I F H G R G G T V G R G G				
Ec	G Y S D S G K D A G R L S A A W A L Y R A Q E G M A E V A K K Y G V Q I T F F H G R G G T V G R G G				
Sb	G Y S D S G K D A G R L S A A W Q L Y V A Q E E M A K V A K K Y G V K L T L F H G R G G T V G R G G				
Si	G Y S D S G K D A G R L S A A W H L Y K A Q E A M A K V A K R Y G V K L T M F H G R G G T V G R G G				
So	G Y S D S G K D A G R L S A A W Q L Y V A Q E E M A K V A K K Y G V K L T L F H G R G G T V G R G G				
Zm	G Y S D S G K D A G R L S A A W Q L Y R A Q E E M A Q V A K R Y G V K L T L F H G R G G T V G R G G				

	650	660	670	680	690
Ah	G P T H L A I L S Q P P -- D T I H G S L R V T I Q G E V I E Q S F G E E H L C F R T L E R Y T A A				
Bs	G P T H L A I L S Q P P E H D S M D - H F V L P F K V K C I E Q S F G E E H L C F R T L Q R F T A A				
Ft	G P T H L A I L S Q P P -- D T I N G S L R V T V Q G E V I E Q S F G E E H L C F R T L Q R F C A A				
Ec	G P T H L A I L S Q P P -- N T I N G S L R V T I Q G E V I E H S F G E E H L C F R T L Q R F T A A				
Sb	G P T H L A I L S Q P P -- D T I N G S I R V T V Q G E V I E F M F G E E N L C F Q S L Q R F T A A				
Si	G P T H L A I L S Q P P -- D T I N G S L R V T V Q G E V I E T S F G E E H L C F R T L Q R F T A A				
So	G P T H L A I L S Q P P -- D T I N G S I R V T V Q G E V I E F M F G E D H L C F Q S L Q R F T A A				
Zm	G P T H L A I L S Q P P -- D T I N G S I R V T V Q G E V I E F C F G E E H L C F Q T L Q R F T A A				

	700	710	720	730	740
Ah	T L E H G M H P P T S P K P E W R A L M D E M A V I T T K E Y R S V V L Q E P R F V E Y F R S A T P				
Bs	T L E H G M H P P I S P K P E W R T L L D E M A V A A T K E Y R S I V L K K P R F V E Y F R L A T P				
Ft	T L E H G M N P P I S P R P E W R E L M D O M A V V A T E E Y R S V V F K E P R F V E Y F R L A T P				
Ec	T L E H G M H P P A S P K P E W R A L M D E V T A V A T E E Y R S Y V F K E P R F V E Y F R S A T P				
Sb	T L E H G M H P P V S P K P E W R K L M E E M A V V A T E E Y R S V V V K E P R F V E Y F R S A T P				
Si	T L E H G M H P P V S P K P E W R A L M D E I A A V A T D E Y R S V V M R E P R F V E Y F R S A T P				
So	T L E H G M H P P V S P K P E W R K L M E E M A V V A T E E Y R S V V V K E P R F V E Y F R S A T P				
Zm	T L E H G M H P P V S P K P E W R K L M D E M A V V A T E E Y R S V V V K E A R F V E Y F R S A T P				

	750	760	770	780	790
Ah	EL EY GR MN IG SR PA KR KP GG GI ET	LR AI PW IF SW TQ TR FH LP VW LG	CG AA		
Bs	EL EY GR MN IG SR PS KR KP GG GIE S	LR AI PW IF SW TQ TR FH LP GG LG	CG AA		
Ft	EL EF GR MN IG SR PS KR KP S GG IES	LR AI PW IF SW TQ TR FH LP VW LG	FG AA		
Ec	ET EY GR LN IG SR PA KR KP GG GT ES	LR AI PW IF SW TQ TR FH LP VW LG	FG AA		
Sb	ET EY GK MN IG SR PA KR RP GG GI TT	LR AI PW IF SW TQ TR FH LP VW LG	VG AA		
Si	ET EY GR LN IG SR PA KR KP KG GI ES	LR AI PW IF SW TQ TR FH LP VW LG	FG AA		
So	ET EY GK MN IG SR PA KR KP GG GI TT	LR AI PW IF SW TQ TR FH LP VW LG	VG AA		
Zm	ET EY GR MN IG SR PA KR RP GG GI TT	LR AI PW IF SW TQ TR FH LP VW LG	VG AA		

	800	810	820	830	840
Ah	FK HV IE KD IK -NL AM LK DM YN QW S FFR VTI	DL LEM VFA KG DP GI AAL YDK			
Bs	FK HV IE KD IK -NL AM LE QM YN EW P FFR VTI	DL VEM VFA KG DP GI AAL YDK			
Ft	FK HA IQ KDSK -NL OM LQ EM YK TW P FFR VTI	DL VEM VFA KG NP GI AAL NDK			
Ec	FN LR HQ EG TS GN IQ TL KE MY NE WP FFR VTI	DL VEM VFA KG DP GI VGF YND			
Sb	FK WA ID KD IK -NF QK LK EM YN EW P FFR VTI	DL LEM VFA KG DP GI AGL YDE			
Si	FE HA MK KD IK -NF RM LK EM YN EW P FFR VTI	DL LEM VFA KG DP TI AGL YDQ			
So	FK WA ID KD IK -NF QK LK EM YN EW P FFR VTI	DL LEM VFA KG DP GI AGL YDL			
Zm	FK FA ID KD VR -NF QV LK EM YN EW P FFR VTI	DL LEM VFA KG DP GI AGL YDE			

	850	860	870	880	890
Ah	LL VK DE LK PF GE NL RK SY LE AQ KF LLE IAG HKD PL	DAD PY LK QI LR LR DP			
Bs	LL VSE EL CP FG EQL RSD YEE TKN FFF QI AG HK E ILE	GDP HLR QR LR LR DP			
Ft	LL VSE DL RP FG ESL RAN YEE TKN YLL KI AG HK DL	LEG DP YL KQG IRL RDP			
Ec	LL VA DEL KPF GE QLR KNY ID TCS FSCR LLG TRKS	LEG DP YL KQRL HLR DP			
Sb	LL VA EEL KPF GK QLR DKY VET QQL LLO IAG HKD ILE	GDP YL KQGL RLR NP			
Si	LL VA DEL KPF GE QLR NNY VET EKL ILO VAG HK E ILE	SDP GLK QQL RLR DP			
So	LL VA DDL KPF GK QLR DKY VET EKL LLO IAG HKD ILE	GDP YL KQGL RLR NP			
Zm	LL VA EEL KPF GK QLR DKY VET QQL LLO IAG HKD ILE	GDP FLK QGL VLR NP			

	900	910	920	930	940
Ah	YT TT LNV FQV YTL KR IR DP SFH VTVR PH LSK EMDA -	NS LA AE LVK LNP T			
Bs	YT TT LNV CQAY TL KR IR DP NYH VTVR PH ISK DY MDST	DK PA AE LVK LNP S			
Ft	YT TT LNV CQAY TL KR IR DP NYH VTLR PH ISK EY AAEP	SK PA DE LIH LNP T			
Ec	YT TT LNV FQAY TL KR IR DP NFK VTLN PPLS NEFADE	-NKPAG -LVK LNP A			
Sb	YT TT LNV FQAY TL KR IR DP SFK VTP QP PLS KEFADE	-NKPAG -LVK LN -G			
Si	YT TT LNV WQAY TL KR IR DP NFK VTP QP PLS KEFADE	-NQ PRG -IVK LNP A			
So	YT TT LNV LQAY TL KR IR DP CFK VTP QP PLS KEFADE	-NKPAG -LVK LNP A			
Zm	YT TT LNV FQAY TL KR IR DP NFK VTP QP PLS KEFADE	-NKPAG -LVK LNP A			

	950	960
Ah	SE YP P GLED TL I L T M KG IA AG M Q NT G	
Bs	SE YA P GLED TL I L T M KG IA AG M Q NT G	
Ft	SE YA P GLED TL I L T M KG IA AG M Q NT G	
Ec	SE YG P GLED TL I L T M KG IA AG M Q NT G	
Sb	ER VP P GLED TL I L T M KG IA AG M Q NT G	
Si	SE YG P GLED TL I L T M KG IA AG M Q NT G	
So	SE YP P GLED TL I L T M KG IA AG M Q NT G	
Zm	SE YP P GLED TL I L T M KG IA AG M Q NT G	

1.2 Multiple Sequence Alignment of PPKD

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Ah  MMAS-AYKGI LARSNHDICAQAL----LKVRLDQIGYLNDQNL LGRS RC
Bs  -----MLIR SAPDVFTHTL-----GYMKDQYQVGC SQC
Ft  MMSLSL SVEGML LKSARE SCLPAR----VNORRNGDLRLRNHHRQSSSFVRC
Ec  MAASVSRAVCG LQGSCLNGRRSRDAP-S-GRRSVAAPRV-WPSKAGV LLL
Sb  MAASVSGATIC LQKPGSKSRRARDATS SFARRSVAAPRSPHAAKASVIRS
Si  -MASVSRAVWS LQRPVSNGTMTREAP-S-GRRSVAAPRS-RRAKAVVIRS
So  MAASVSGATIC LQKPGSKGRRARDAT-SFARRSVAAPRSPHAAKASVIRS
Zm  MAASVSR A-ICVQKPGSKCTRDREAT-SFARRSVAAPRPPHAKAAGVIRS

Ah  KSI RRVKYQN-KKCLDQNA RH LRSP--TVM AVVSEPI-ATAK KR VFTFGK
Bs  NSFQRVQFRNRRC PHRLTSQSQSNRQDVMALISDPVSTTTQQRVFTFGK
Ft  LTPARVSRPE-LR-----SSGLT PPR-AVLN PVSPPV-TTAKKR VFTFGK
Ec  GSGS-----GR-----SQHCAPAN-AIAD--AVPI--ATKKRVFLFGK
Sb  DAGA-----GR-----GQHCAPLR-AVVD--AAP I--ATKKRVFYFGK
Si  ESGS-----GR-----GEHCAPAR-AVAD--VAPI-QATKKRVFHFHGK
So  DAGA-----GR-----GQHCS PMR-AVVD--AAP I--ATKKRVFYFGK
Zm  DSGA-----GR-----GQHCS PLR-AVVD--AAP I-QT TKKRVFHFHGK

Ah  GRSEGNKSMKS LLGGKGANLAEMS SIGLSVPPGLTIISTEACQEYQEN GKK
Bs  GRSDGDKSMKS LLGGKGANLAEMA SIGLSVPPGLTIISTEACQEYQDS GKM
Ft  GRSEGNRDMKS LLGGKGANLAEMS SIGLSVPPGLTIISTEACEEYQQNGKS
Ec  GKSEGNRGMKE LLGGKGANLAEMS SIGLSVPPGFTVSTEACEEYQAAGCT
Sb  GKSEGDKSMKE LLGGKGANLAEMS SIGLSVPPGFTVSTEACKQYQDAGCI
Si  GKSEGNETMKE LLGGKGANLAEMS SIGLSVPPGFTVSTEACKQYQEAGRS
So  GKSEGDKSMKE LLGGKGANLAEMS SIGLSVPPGFTVSTEACKQNQDAGSI
Zm  GKSEGNKTMKE LLGGKGANLAEMA SIGLSVPPGFTVSTEACKQYQDAGCA

Ah  LPESLWEEILEGLRVIENDMGAA LGDSSK P L L L S V R S G A A I S M P G M M D T V
Bs  LPESLWEEILEGLRVIESDMGAY LGDSS T P L L L S V R S G A A I S M P G M M D T I
Ft  LPPGLWDEISEGLDYVOKEMSAS LGDP SK P L L L S V R S G A A I S M P G M M D T V
Ec  LPQGLWDEVLDGLAWVEEYMGAG LGDPQR P L L L S V R S G A A V S M P G M M D T V
Sb  LPAGLWAEILDGLQFVEEYMGAT LGDPQR P L L L S V R S G A A V S M P G M M D T V
Si  LPQGLWDEIIDGLAWVEEEMGAR LGDPQR P L L L S V R S G A A V S M P G M M D T V
So  LPAGHWREILDGLQFVEEYMGAT LGDPQR P L L L S E R S G S R G V Q A G M M D T V
Zm  LPAGLWAEIVDGLQWVEEYMGAT LGDPQR P L L L S V R S G A A V S M P G M M D T V

Ah  LNLGLNDEVVTALA AKSGERFAYD SFRRFLDMF GGVVMG IPHSAFEEKLE
Bs  LNLGLNDEVVSGLA AKSGERFAYD SFRRFLDMF GCVVMG IPHSSFEEKLE
Ft  LNLGLNDEVVAGLAGKSGARFAYD SYRRFLDMF GNVVMG IPHSLFDEKLE
Ec  LNLGLNDEVAAGLA AKSGDRFAYD SYRRFLDMF GNVVLD IPHALFEEKLE
Sb  LNLGLNDEVAAGLA AKSGERFAYD SFRRFLDMF GNVVMD IPRSLFEKLE
Si  LNLGLNDEVAAGLGA KSGERFAND SYRRFLDMF GNVVMD IPHALFEEKLE
So  LNLGLNDEVAAGLA AKSGERFDYD TFRRFHDMYGNVVM DIPRSLIEEKLE
Zm  LNLGLNDEVAAGLA AKSGERFAYD SFRRFLDMF GNVVMD IPRSLFEKLE

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	240	250	260	270	280				
Ah	KLKEE	KGVKL	DTELTAS	DLKELAE	QYKNVYLET	TGEAF	SPSS	PLKQL	QLAV
Bs	KLKQM	KGVKL	DTELTAS	DLKELAE	QYKNVYLET	KGEVFP	ADPKK	QQLAV	
Ft	QMKAE	KGIHL	DTDLTAA	DLKDLV	EKYKNVY	VEAKGE	KFPID	PKKQLE	LAV
Ec	HMKEA	KG	LKNDDTDLTAS	DLKELVE	QYKDVY	VEAKGE	PFPSP	DPKKQLE	LSV
Sb	HMKES	KG	VKNDDTDLTAA	DLKELVG	QYKEVYL	TAKGE	PFPSP	DPKKQLE	LAV
Si	AMKEA	KG	VKNDDTDLTAS	DLKELVA	QYKEVY	VEAKGE	PFPSP	DPKKQLE	LAV
So	HMKES	KG	VKNDDTDLTAA	DLKELVG	QYKEVYL	TAKGE	PFPSP	DPKKQLE	LAV
Zm	HMKES	KG	LKNDDTDLTAS	DLKELVG	QYKEVYLS	AKGE	PFPSP	DPKKQLE	LAV

	290	300	310	320	330			
Ah	EAVFE	SWDSPRAN	KYRSINQ	ISGLKGA	AVNIQ	SMVFGNMG	NTSGTG	VLFT
Bs	QAVFD	SWDSPRA	VKYRSINQ	ISGLKGT	AVNIQ	SMVFGNMG	NTSGTG	VLFT
Ft	NAVFD	SWDSPRAN	KYRSINQ	ITGLKGT	AVNIQ	SMVFGNMG	NTSGTG	VLFT
Ec	LAVFN	SWDSPRA	KKYRSINQ	ITGLRGT	AVNVQ	CMVFGNMG	KTSGTG	VLFT
Sb	RAVFN	SWESPRA	KKYRSINQ	ITGLVGT	AVNVQ	SMVFGNMG	NTSGTG	VLFT
Si	LAVFN	SWDSPRAN	KYRSINQ	ITGLKGT	AVNVQ	SMVFGNMG	DTSGTG	VLFT
So	RAVFN	SWESPRA	KKYRSINQ	ITGLVGT	AVNVQ	SMVFGNMG	NTSGTG	VLFT
Zm	LAVFN	SWESPRA	KKYRSINQ	ITGLRGT	AVNVQ	CMVFGNMG	NTSGTG	VLFT

	340	350	360	370	380				
Ah	RNPS	TGEKKLYGE	FLINAQGED	VVAGIRTPED	L	GAMERC	MP	EAYKEL	VEN
Bs	RNPNT	TGERKLYGE	FLINAQGED	VVAGIRTPED	L	DTMKSC	MP	EAYTEL	VON
Ft	RNPS	TGEKKLYGE	FLINAQGED	VVAGIRTPED	L	GTMETC	MP	EAYKEL	VEN
Ec	RNPS	TGEKKLYGE	FLVNAQGED	VVAGIRTPED	L	DAMKDC	MP	QAFEEL	VEN
Sb	RNPNT	TGEKKLYGE	FLINAQGED	VVAGIRTPED	L	DAMKDV	MP	QAYEEL	VEN
Si	RNPS	TGEKKLYGE	FLVNAQGED	VVAGIRTPED	L	DAMKAQ	MP	DAYVEL	VEN
So	RNPNT	TGEKKLYGE	FLINAQGED	VVAGIRTPED	L	DAMKDV	MP	QAYEEL	VEN
Zm	RNPNT	TGEKKLYGE	FLVNAQGED	VVAGIRTPED	L	DAMKNL	MP	QAYDEL	VEN

	390	400	410	420	430			
Ah	CEILE	QHYKDMQ	DI	EFTVQENRLWMLQCRS	GKRTGK	GAVKI	IAVD	LVNEGI
Bs	CEILE	QHYKDMMD	DI	EFTVQENRLWMLQCRS	GKRTGK	GAVKI	IAID	MVNEGK
Ft	CEILE	RHYKDMMD	DI	EFTVQENRLWMLQCRT	GKRTGK	GAVRI	IAVDM	VNEGL
Ec	CNLL	EGHYKDLMD	DI	EFTVQENRLWMLQCRS	GKRTGK	GAVKI	IAVD	VVNEGL
Sb	CNILE	SHYKEMQ	DI	EFTVQGNRLWMLQCRT	GKRTG	AGAVKI	IAVDM	VSEGL
Si	CKILE	SHYKEMMD	DI	EFTVQENRLWMLQCRS	GKRTG	QGAVKI	IAVDM	VNEGL
So	CNILE	SHYKEMQ	DI	EFTVQENRLWMLQCRT	GKQTGT	GAVKI	IAVDM	VSEGL
Zm	CNILE	SHYKEMQ	DI	EFTVQENRLWMLQCRT	GKRTG	KSAVKI	IAVDM	VNEGL

	440	450	460	470	480				
Ah	VDTNT	AVKMVEP	QHLDQ	LLHPQFED	PSAYKD	KVIAT	GLPAS	PGA	AVGQIV
Bs	INSRT	AIKMVEP	QHLDQ	LLHPQFED	ASAYKER	VITS	GLPAS	PGA	AVGQIV
Ft	IDTRT	AIKRVET	QHLDQ	LLHPQFED	PSAYKSH	VVAT	GLPAS	PGA	AVGQVC
Ec	VDRHA	AIKMVEP	GHLDQ	LLHPQFEN	PSAYKD	QVIAT	GLPAS	PGA	AVGQIV
Sb	VERRQ	AIKMVEP	GHLDQ	LLHPQFEN	PAAYKD	KVIAT	GLPAS	PGA	AVGQIV
Si	VERRQ	AIKMVEP	GHLDH	LLHPQFEN	PSAYKD	QVIAT	GLPAS	PGA	AVGQIV
So	AERRQ	AIKMVEP	GHLDQ	LLHPQFEN	AAAYKD	QVIAT	GLPAS	PGA	AVGQIV
Zm	VEPRS	AIKMVEP	GHLDQ	LLHPQFEN	PSAYKD	QVIAT	GLPAS	PGA	AVGQVV

	490	500	510	520	530					
Ah	FSAED	DAEAWHA	QGKSA	VILVTR	TETSPED	VGGMHV	AAGILT	ARGGI	TSHA	AV
Bs	FSAAY	DAEAWHA	QGKSA	AILVTR	NETSPED	VGGMHAA	AAGILT	ARGG	MTSHA	AV
Ft	FSAED	DAETWHA	QGKSA	AILVTR	TETSPED	VGGMHAA	AAGILT	ARGG	MTSHA	AV
Ec	FTAED	DAEAWHA	QGKAA	AILVTR	TETSPED	VGGMHAA	AAGILT	ARGG	MTSHA	AV
Sb	FTAED	DAEAWHA	QGKAA	AILVRA	AETSPED	VGGMHAA	AAGILT	ERG	GGMTSHA	AV
Si	FTAED	DAEAWHA	QGKAA	AILVTR	TETSPED	VGGMHAA	AVGILT	ARGG	MTSHA	AV
So	STAED	DAEAWHA	QGKAA	AILVRA	AETSPED	VGGMHAA	AAGILT	ERG	GGMTSHA	AV
Zm	FTAED	DAEAWH	SQGKAA	AILVRA	AETSPED	VGGMHAA	AVGILT	ERG	GGMTSHA	AV

	540	550	560	570	580
Ah	VARGWGKCCVSGCSEI	QVNDAKKVV	VTIGNNVLA	EGDWLSLNGT	TGGEVILG
Bs	VARGWGKCCVSGCSEI	KVNETNKS	LVVGNVLT	EGDWLSLNGS	TGGEVILG
Ft	VARGWGKCCVSGCAD	IRVNDDMKI	FTIGDRV	IKEGDWLSLNGT	TGGEVILG
Ec	VARGWGKCCVSGCAS	VRVNDAEKVV	VAIGDKV	LQEGDWLSLNGS	TGGEVILG
Sb	VARGWGKCCVSGCSA	IRVNDAEKTV	VAIGDHV	LSEGEWLSLNGS	TGGEVILG
Si	VARGWGKCCVSGCSS	VLVNDAEKSV	VIGDKVM	HEGEWLSLNGS	TGGEVIVG
So	VARGWGKCCVSGCSA	IRVNDAEKTV	VAIGDHV	LSEGEWLSLNGS	TGGEVILG
Zm	VARWVGKCCVSGCSG	IRVNDAEKLV	VTIGSHV	LREGEWLSLNGS	TGGEVILG

	590	600	610	620	630			
Ah	KEPLAPPALS	GDLEVFMSWAD	NLRRLKVM	ANADTPE	DAL	TARNNGAE	GIG	
Bs	KEPLSPPALS	GDLETFMSWT	DAVRRRLKVM	ANADTPE	DALA	AARNNGAE	GIG	
Ft	KQLLAPPAMS	NDLEIFMSWAD	QARRRLKVM	ANADTPN	DAL	TARNNGA	QGIG	
Ec	KQPLSPPALS	GDLGIFMSWV	DEVKLV	LANADTPE	DALA	AARNNGAE	GIG	
Sb	KQPLSPPALS	GDLGTFMSWV	DDVRKLV	LANADTP	GDALA	AARNNGA	QGIG	
Si	KQPLSPPVLS	GDLGTFMSWV	DEVQ	LVLANADTPE	DAL	TARNNGAE	GIG	
So	KQPLSPPSLS	GDLGTFMSWV	DEVKLV	LANADTPE	DALA	AARNNGA	QGIG	
Zm	KQPLSPPALS	GDLGTFMAWV	DDVRKLV	LANADTP	D	DAL	TARNNGA	QGIG

	640	650	660	670	680
Ah	LCRTEHMFASDD	RIKTVRKM	MIMAVTPE	QRKAALDQ	LLPYQRSDFEGIFR
Bs	LCRTEHMFASDD	RIKAVRKM	MIMAVTPE	QRKAALDQ	LLPYQRSDFEGIFR
Ft	LCRTEHMFASD	RIKAVRKM	MIMAVTPE	QRKVALDL	LLPYQRSDFEGIFR
Ec	LCRTEHMFASD	RIKAVRQ	MIMAPTLE	LRQKALDR	LLPYQRSDFEGIFR
Sb	LCRTEHMFASD	RIKAVRQ	MIMAPTVEL	RQQALDR	LLPYQRSDFEGIFR
Si	LCRTEHMFASD	RIKAVRQ	MIMAPTLE	LRQKALDR	LLPYQRSDFEGIFR
So	LCRTEHMFASD	RIKAVRQ	MIMAPTVEL	RQQALDR	LLPYQRSDFEGIFR
Zm	LCRTEHMFASD	RIKAVRQ	MIMAPTLE	LRQQALDR	LLTYQRSDFEGIFR

	690	700	710	720	730	
Ah	AMDGLPVTIRLLDP	PLHEFP	PEGDLD	EIVKDL	ASEVGMT	EDEVYSRIEKL
Bs	AMDGLPVTIRLLDP	PLHEFL	PEGDLQ	QIMNEL	ASETGIT	EDEVYSRVEKL
Ft	AMDGLPVTIRLLDP	PLHEFL	PEGDL	EHIVNEL	AVDTGMS	ADEIYSKIENL
Ec	AMDGLPVTIRLLDP	PLHEFL	PEGNV	EIVREL	CAETGS	NEEEALARIEKL
Sb	AMDGLSVTIRLLDP	PLHEFL	PEGNV	EIVREL	CAETGAN	EEAALERVEKL
Si	AMDGLSVTIRLLDP	PLHEFL	PDGN	VEDIVREL	CSETGAN	QEEALARIESL
So	AMDGLSVTIRLLDP	PLHEFL	PEGNV	EIVREL	CAETGAN	EEAALERVEKL
Zm	AMDGLPVTIRLLD	HPSEF	LPEGN	IEDIVSEL	CAETGAN	QEDALARIEKL

	740	750	760	770	780	
Ah	SEVNPMLGFRGCRLGI	SYPELTEMQARA	IFQA	AVSMT	NQGIK	VLPEIMVP
Bs	SEVNPMLGFRGCRLGI	SYPELTEMQARA	VFQA	AVSMT	NQGIT	VLPEIMVP
Ft	SEVNPMLGFRGCRLGI	SYPELTEMQV	RAIFQA	AVSMT	NQGV	TVIPEIMVP
Ec	SEVNPMLGFRGCRLGI	SYPELTEMQARA	IFEAA	TMTKP	GCS	SFSDNVP
Sb	AEVNPMLGFRGCRLGI	SYPELTEMQARA	IFEAA	IAMS	NQGV	VFPEIMVP
Si	SEVNPMLGFRGCRLGI	SYPELTEMQARA	IFEAA	IAM	NQGV	VFPEIMVP
So	AEVNPMLGFRGCRLGI	SYPELTEMQARA	IFEAA	IAMS	NQGV	VFPEIMVP
Zm	SEVNPMLGFRGCRLGI	SYPELTEMQARA	IFEAA	IAM	NQGV	VFPEIMVP

	790	800	810	820	830	
Ah	LVGTPQELSHQ	MGVIR	DVASKV	FSETG	TTLTFKV	GTMIEIPRAALIADEI
Bs	LVGTPQELGHQ	VNLR	SVATK	VFSEM	GSSVR	YKVGTMIEIPRAALVADEI
Ft	LVGTPQELRHQ	ISV	IRGVA	ANVFA	EMGVT	LEYKVGTMIEIPRAALIAEEI
Ec	LVGTPQELGHQ	VAV	IREIAN	TVFTAM	GKTIS	YKIGTMIEIPRAALVADEI
Sb	LVGTPQELGHQ	VNV	IKQTA	EKFV	ANAGKT	IGYKIGTMIEIPRAALVADQI
Si	LVGTPQELGNQ	VAL	IRETAN	KVFAAL	GKTID	YKIGTMIEIPRAALVADEI
So	LVGLPQELGHQ	VNV	IKQVA	EKFV	TSMGKT	IGYKIGTMIEIPRAALVADQI
Zm	LVGTPQELGHQ	VTL	IRQVA	EKFV	ANV	GKTIGYKVGTMIEIPRAALVADEI

	840	850	860	870	880				
Ah	AKEAE	FFSFGTNDL	TQMTFGYSR	DDVGKFL	LP	PIYMAQ	GILQT	DPFEV	LDQK
Bs	AVEAD	FFSFGTNDL	TQMTFGYSR	DDVGKFL	LP	KYLSN	GILQA	DPFEV	LDQK
Ft	GKEAD	FFSFGTNDL	TQMTFGYSR	DDVGKFL	Q	IYLAQ	GILQH	DPFEV	IDQK
Ec	AEQAE	FFSFGTNDL	TQMTFGYSR	DDVGKFL	PIYLS	SO	GILQH	DPFEV	LDQR
Sb	AEQAE	FFSFGTNDL	TQMTFGYSR	DDVGKFL	PIYLAQ	GILQH	DPFEV	LDQR	
Si	AEQAE	FFSFGTNDL	TQMTFGYSR	DDVGKFL	PIYLS	SO	GILQH	DPFEV	LDQR
So	AEQAE	FFSFGTNDL	TQMTFGYSR	DDVGKFL	PIYLAQ	GILQH	DPFEV	LDQR	
Zm	AEQAE	FFSFGTNDL	TQMTFGYSR	DDVGKFL	IPVH	LAQ	GILQH	DPFEV	LDQR

	890	900	910	920	930						
Ah	GVGQL	LIK	HATEK	GRASRP	SLKVGIC	GEHGGEP	SSVAFF	AEA	GLDY	VSCSP	
Bs	GVGQL	LIK	LATEK	GRAAKP	SLKVGIC	GEHGGEP	SSVAFF	AEA	GLDY	VSCSP	
Ft	GVGQL	LIK	MATEK	GRAANP	SLKVGIC	GEHGGEP	SSVAFF	DGV	GLDY	VSCSP	
Ec	GVGEL	LVK	FATER	GRKTRP	NLKVGIC	GEHGGEP	L	SVAFF	AKT	GLDY	VSCSP
Sb	GVGEL	LVK	FATER	GRQTRP	NLKVGIC	GEHGGEP	SSVAFF	AKV	GLDY	VSCSP	
Si	GVGEL	LVK	FATER	GRKARP	NLKVGIC	GEHGGEP	SSVAFF	AKS	GLDY	VSCSP	
So	GVGEL	LVK	FATER	GRQTRP	NLKVGIC	GEHGGEP	SSVAFF	AKA	GLDY	VSCSP	
Zm	GVGEL	LVK	FATER	GRKARP	NLKVGIC	GEHGGEP	SSVAFF	AKA	GLD	FVSCSP	

	940	950
Ah	FRVPIARLAAAQ	VAV
Bs	FRVPIARLAAAQ	VAV
Ft	FRVPIARLAAAQ	VIV
Ec	FRVPIARLAAAQ	VLV
Sb	FRVPIARLAAAQ	VLV
Si	FRVPIARLAAAQ	VLV
So	FRVPIARLAAAQ	VLV
Zm	FRVPIARLAAAQ	VLV