

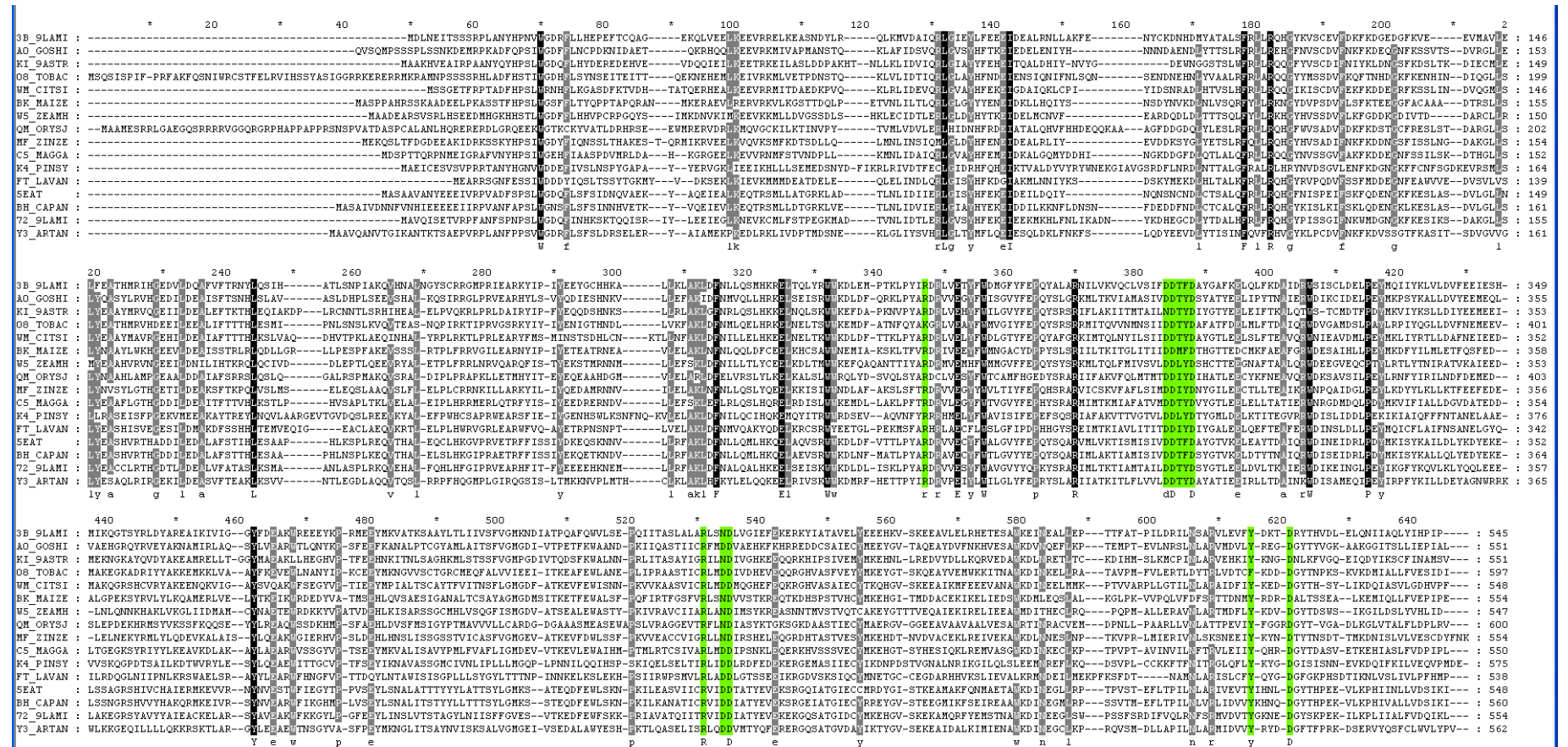
# molecular informatics

models – molecules – systems

## Supporting Information

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S1. Multiple sequence alignment of selected plant sTS sequences with the conserved residues and the DDxxD motif highlighted in green.



S2. List of all plant sTS sequences used in this analysis.

Short ID	GenBank ID	Species	Function/Source
<b>Group A1a</b>			
YK_VITVI	AY561843	Vitis vinifera (Grape)	(+)-valencene synthase
UG_VITVI	CU459241	Vitis vinifera (Grape)	Chromosome chr18 scaffold_24, whole genome shotgun
EZ_VITVI	CU459241	Vitis vinifera (Grape)	Chromosome chr18 scaffold_24, whole genome shotgun
84_VITVI	CU459241	Vitis vinifera (Grape)	
6X_VITVI	AM427027	Vitis vinifera (Grape)	Putative uncharacterized protein
KR_VITVI	AM432247	Vitis vinifera (Grape)	Chromosome chr18 scaffold_24, whole genome shotgun
<b>Group A1b</b>			
1Q_VITVI	CU459241	Vitis vinifera (Grape)	Chromosome chr18 scaffold_24, whole genome shotgun
T1_VITVI	CU459241	Vitis vinifera (Grape)	Chromosome chr18 scaffold_24, whole genome shotgun
K0_VITVI	CU459241	Vitis vinifera (Grape)	Chromosome chr18 scaffold_24, whole genome shotgun
Q4_VITVI	CU459241	Vitis vinifera (Grape)	Chromosome chr18 scaffold_24, whole genome shotgun
RW_VITVI	CU459241	Vitis vinifera (Grape)	Chromosome chr18 scaffold_24, whole genome shotgun
<b>Group A1c</b>			
QT_VITVI	CU459221	Vitis vinifera (Grape)	Chromosome chr19 scaffold_4, whole genome shotgun
S0_VITVI	AM429616	Vitis vinifera (Grape)	Putative uncharacterized protein
Y3_VITVI	CU459221	Vitis vinifera (Grape)	Chromosome chr19 scaffold_4, whole genome shotgun
XQ_VITVI	AM459143	Vitis vinifera (Grape)	Putative uncharacterized protein

		<b>Group A2</b>	
3B_9LAMI	AY508729	Pogostemon cablin (patchouli)	(-)-Germacrene D synthase
FK_9LAMI	AY508727	Pogostemon cablin (patchouli)	(-)-Germacrene D synthase
73_9LAMI	AY508730	Pogostemon cablin (patchouli)	(-)-Patchoulol synthase
DC_9MAG N	EU798693	Santalum album (white sandalwood)	Germacrene D-4-ol
		<b>Group A3</b>	
A0_GOSHI	AF270425	Gossypium hirsutum (Upland cotton)	(+)-delta-cadinene synthase
DC_GOSHI	U88318	Gossypium hirsutum (Upland cotton)	(+)-delta-cadinene synthase
QK_GOSA R	U23205	Gossypium arboreum (Tree cotton)	(+)-delta-cadinene synthase isozyme XC14
50_GOSAR	Y16432	Gossypium arboreum (Tree cotton)	(+)-delta-cadinene synthase isozyme C2
VE_GOSAR	U23206	Gossypium arboreum (Tree cotton)	(+)-delta-cadinene synthase isozyme XC1
MY_GOSA R	X95323	Gossypium arboreum (Tree cotton)	(+)-delta-cadinene synthase
4N_GOSHI	Ay800107	Gossypium hirsutum (Upland cotton)	(+)-delta-cadinene synthase
8W_GOSA R	X96429	Gossypium arboreum (Tree cotton)	(+)-delta-cadinene synthase isozyme A
		Group A4a	
BN_ARTAN	AJ271793	Artemisia annua (Sweet wormwood)	Amorpha-4,11-diene synthase; Artemisinin synthase
CP_ARTAN	AF472361	Artemisia annua (Sweet wormwood)	(E)-Beta-caryophyllene synthase
UK_ARTAN	AF157059	Artemisia annua (Sweet wormwood)	8-epi-cedrol synthase
TR_9ASTR	AY900123	Ixeridium dentatum	Sesquiterpene cyclase
S4_ARTAN	EF197888	Artemisia annua (Sweet wormwood)	Amorpha-4,11-diene synthase
96_ARTAN	AF138959	Artemisia annua (Sweet wormwood)	Amorpha-4,11-diene synthase
		<b>Group A4b</b>	

3W_9ASTR	AJ583448	Solidago canadensis (Goldenrod)	(-)-Germacrene D synthase
HS_9ASTR	AY397645	Solidago canadensis (Goldenrod)	(-)-Germacrene D synthase
8P_9ASTR	AJ304452	Solidago canadensis (Goldenrod)	(+)-Germacrene A synthase
4E_9ASTR	AY397644	Solidago canadensis (Goldenrod)	(+)-Germacrene D synthase
KI_9ASTR	AJ583447	Solidago canadensis (Goldenrod)	(+)-Germacrene D synthase
<b>Group A4c</b>			
TF_ARTAN	AJ271792	Artemisia annua (Sweet wormwood)	
5D_ARTAN	EU252034	Artemisia annua (Sweet wormwood)	Sesquiterpene cyclase
II_ARTAN	AY835398	Artemisia annua (Sweet wormwood)	(E)-beta-farnesene synthase
1V_ARTAN	AF304444	Artemisia annua (Sweet wormwood)	Sesquiterpene cyclase
<b>Group A5a</b>			
CA_SOLLC	AF035631	Solanum lycopersicum (Tomato), Lycopersicon esculentum	Germacrene C synthase
ED_SOLLC	AF279454	Solanum lycopersicum (Tomato)	Beta-caryophyllene synthase; alpha-humulene synthase, delta- elemene
FD_SOLLC	AF035630	Solanum lycopersicum (Tomato)	Germacrene C synthase, delta- elemene
MM_SOLH A	AF279455	Solanum habrochaites (Wild tomato), Lycopersicon hirsutum	Germacrene B synthase
L5_SOLHA	AF279456	Solanum habrochaites (Wild tomato), Lycopersicon hirsutum	Germacrene D
08_TOBAC	AY049090	Nicotiana tabacum (Common tobacco)	Cyclase
H1_TOBAC	AY495694	Nicotiana tabacum (Common tobacco)	Cyclase
EG_9SOLA	AY860847	Fabiana imbricata	Sesquiterpene synthase
3A_OCIBA	AY693643	Ocimum basilicum (Sweet basil)	Beta-Selinene synthase
DE_OCIBA	AY693644	Ocimum basilicum (Sweet basil)	Germacrene D synthase
<b>Group A5b</b>			

M4_CUCS A	AY640155	Cucumis sativus (Cucumber)	(E)-Beta-caryophyllene synthase
PA_CUCME	EU158098	Cucumis melo (Muskmelon)	Delta-cadinene synthase
W4_9APIA	EF081260	Centella asiatica	Sesquiterpene cyclase
<b>Group A5c</b>			
2T_VITVI	AY561842	Vitis vinifera (Grape)	(-)-germacrene D synthase
GA_VITVI	AM481907	Vitis vinifera (Grape)	Putative uncharacterized protein
ZO_VITVI	CU459449	Vitis vinifera (Grape)	Chromosome undetermined scaffold_232, genome shotgun
NF_POPJC	AY438099	Populus trichocarpa x deltoides	(-)-germacrene D synthase
AJ_ACTDE	AY789791	Actinidia deliciosa (Kiwi)	Germacrene D synthase
<b>Group A6a</b>			
5G_MEDTR	AC172744	Medicago truncatula (Barrel medic)	Terpene synthase-like
ZO_MEDTR	AC172744	Medicago truncatula (Barrel medic)	Terpene synthase-like
5C_CUCME	EU158099	Cucumis melo (Muskmelon)	Alpha-Farnesene synthase
WR_CUCS A	AY640154	Cucumis sativus (Cucumber)	(E,E)-alpha-farnesene synthase
<b>Group A6b</b>			
99_MEDTR	AY766250	Medicago truncatula (Barrel medic)	Wound-inducible putative cytosolic terpene synthase 2
XG_MEDT R	DQ188184	Medicago truncatula (Barrel medic)	Beta-caryophyllene synthase; Germacrene D synthase
EV_MEDTR	AY763425	Medicago truncatula (Barrel medic)	(E)-Beta-caryophyllene synthase
<b>Group A7</b>			
EM_9ROSI	AF374462	Citrus junos	(E)-beta-farnesene synthase
HV_9ROSI	AF288465	Citrus junos	Terpene synthase
WM_CITSI	AF441124	Citrus sinensis (Sweet orange)	Valencene synthase

		<b>Group B1</b>	
BK_MAIZE	AY518314	Zea mays (Maize)	
S3_MAIZE	AY518311	Zea mays (Maize)	Terpene synthase 5
NN_MAIZE	AY518310	Zea mays (Maize)	(S)-beta-bisabolene
5G_MAIZE	AY518313	Zea mays (Maize)	Sesquithujene
2I_MAIZE	AY647253	Zea mays (Maize)	(-)-Beta-Macrocarpene
5I_MAIZE	AY518315	Zea mays (Maize)	(-)-Beta-Macrocarpene
WZ_MAIZE	AY647254	Zea mays (Maize)	(-)-Beta-Macrocarpene
Y4_ORYSJ	EU596452	Oryza sativa (Rice)	Zingiberene
KH_ORYSI	CM000133	Oryza sativa (Rice)	Putative uncharacterized protein
XU_MAIZE	AY928078	Zea mays (Maize)	(E)-beta-farnesene synthase
UP_ORYSI	CM000126	Oryza sativa (Rice)	Putative uncharacterized protein
		<b>Group B2</b>	
W5_ZEAM H	EU259639	Zea mays huehuetenanangensis	(E)-Beta-caryophyllene synthase
XY_ZEADI	EU259638	Zea diploperennis (Diploperennial teosinte)	(E)-Beta-caryophyllene synthase
SS_ZEAM M	EU259641	Zea mays mexicana	(E)-Beta-caryophyllene synthase
6H_ZEAMP	EU259642	Zea mays parviglumis (Balsas teosinte)	(E)-Beta-caryophyllene synthase
Y1_MAIZE	EU259633	Zea mays (Maize)	(E)-Beta-caryophyllene synthase
R6_ZEALU	EU259640	Zea luxurians (Guatemalan teosinte)	(E)-Beta-caryophyllene synthase
JA_ZEAPE	EU259643	Zea perennis (Perennial teosinte)	(E)-Beta-caryophyllene synthase
RE_ORYSJ	DQ872158	Oryza sativa (Rice)	(E)-beta-caryophyllene (46)/beta-elemene synthase
		<b>Group B3</b>	

29_ORYSI	CM000131	Oryza sativa (Rice)	Putative uncharacterized protein
HW_MAIZE E	AF296122	Zea mays (Maize)	Sesquiterpene cyclase 1
<b>Group B4</b>			
HQ_ORYS A	CR855113	Oryza sativa (Rice)	
CD_ORYSA	CR855113	Oryza sativa (Rice)	
WY_ORYS A	CR855239	Oryza sativa (Rice)	OSIGBa0139N19-OSIGBa0137L10.6 protein
BK_ORYSJ	AP008210	Oryza sativa (Rice)	
EQ_ORYSJ	AP008210	Oryza sativa (Rice)	Os04g0341800 protein
ZA_ORYSA	CR855113	Oryza sativa (Rice)	OSIGBa0106g08.3 protein
MB_ORYS A	CR855113	Oryza sativa (Rice)	OSIGBa0106g08.5 protein
JP_ORYSJ	AP008209	Oryza sativa (Rice)	
QM_MAIZE	AY518316	Zea mays (Maize)	Terpene synthase 7
8X_MAIZE	AY928080	Zea mays (Maize)	Terpene synthase 8
6S_ORYSJ	DQ872159	Oryza sativa (Rice)	(E,E)-Farnesol
X2_ORYSJ	DP000009	Oryza sativa (Rice)	Terpene synthase, metal binding domain containing protein
QM_ORYSJ	DP000009	Oryza sativa (Rice)	Terpene synthase, metal binding domain containing protein
<b>Group B5</b>			
MF_ZINZE	AB247334	Zingiber zerumbet (Shampoo ginger)	Beta-Eudesmol
N9_ZINOF	AY860846	Zingiber officinale (Ginger)	(+)-Germacrene D
SP_ZINZE	AB247331	Zingiber zerumbet (Shampoo ginger)	Alpha-humulene synthase
C9_ELAOL	AF080245	Elaeis oleifera (Oil palm)	Sesquiterpene synthase
IG_9ASPA	EU145743	Vanda hybrid cultivar	Sesquiterpene synthase



<b>Group B6</b>			
C5_MAGG A	EU366429	Magnolia grandiflora (Southern magnolia)	Beta-cubebene synthase
<b>Group C1</b>			
49_PICAB	AF369920	Picea abies (Norway spruce)	Gamma-humulene synthase-like protein; Longifolene synthase
2L_PICAB	AY473625	Picea abies (Norway spruce)	Longifolene synthase
M5_PICSI	BT070245	Picea sitchensis (Sitka spruce)	
K6_PINSY	EF679332	Pinus sylvestris (Scots pine)	Longifolene synthase; alpha-longipinene synthase
K4_PINSY	EF679330	Pinus sylvestris (Scotss pine)	Beta-caryophyllene synthase; alpha-humulene synthase
J4_PICSI	DQ195276	Picea sitchensis (Sitka spruce)	Delta-selinene-like synthase
02_ABIGR	U92266	Abies grandis (Grand fir)	Delta-selinene synthase
N7_PICSI	BT071364	Picea sitchensis (Sitka spruce)	
K5_PINSY	EF679331	Pinus sylvestris (Scots pine)	1(10),5-germacradiene-4-ol synthase
G8_ABIGR	U92267	Abies grandis (Grand fir)	Gamma-humulene synthase
<b>Group C2</b>			
S2_PINTA	AF543528	Pinus taeda (Loblolly pine)	(E,E)-alpha-farnesene synthase
VM_PICAB	AY473627	Picea abies (Norway spruce)	(E,E)-alpha-farnesene synthase
<b>Group C3</b>			
VW_MAIZE	AF529266	Zea mays (Maize)	(E,E)-Farnesol
0J_OCIBA	AY693646	Ocimum basilicum (Sweet basil)	Alpha-zingiberene synthase
FT_LAVAN	DQ263742	Lavandula angustifolia (Lavender)	(E)-alpha-bergamotene synthase
P5_ANTMA	EF433761	Antirrhinum majus (Garden snapdragon)	(3S)-(E)-beta-Caryophyllene
XV_MEDTR	AY766249	Medicago truncatula (Barrel medic)	(3S)-(E)-Nerolidol
AZ_MALD	AY182241	Malus domestica (Apple)	(E,E)-alpha-farnesene synthase

O			
<b>Group D1</b>			
EC_SOLTU	AF043299	Solanum tuberosum (Potato)	Putative vetispiradiene synthase 4
6I_SOLTU	AF043298	Solanum tuberosum (Potato)	Putative vetispiradiene synthase 3
H6_SOLTU	AB022719	Solanum tuberosum (Potato)	Vetispiradiene synthase
1W_SOLT U	AB022598	Solanum tuberosum (Potato)	Vetispiradiene synthase
U3_SOLTU	AB023816	Solanum tuberosum (Potato)	Vetispiradiene synthase
67_SOLLC	AF171216	Solanum lycopersicum (Tomato)	Vetispiradiene synthase
A2_SOLTU	AF042382	Solanum tuberosum (Potato)	Vetispiradiene synthase
F6_SOLTU	AB022720	Solanum tuberosum (Potato)	Putative vetispiradiene synthase
VX_CAPAN	AF326117	Capsicum annuum (Bell pepper)	Sesquiterpene cyclase
DU_HYOM U	U20188	Hyoscyamus muticus (Egyptian henbane)	Vetispiradiene synthase
<b>Group D2</b>			
SEAT			
LJ_TOBAC	L04680	Nicotiana tabacum (Common tobacco)	5-epi-aristolochene synthase
PE_9SOLA	AF484124	Nicotiana attenuata	5-epi-aristolochene synthase 34
Z1_TOBAC	AY303939	Nicotiana tabacum (Common tobacco)	Epi-aristolochene synthase 110
W7_9SOLA	AF484123	Nicotiana attenuata	5-epi-aristolochene synthase
V4_9SOLA	AF542544	Nicotiana attenuata	5-epi-aristolochene synthase
A2_9SOLA	AF484125	Nicotiana attenuata	5-epi-aristolochene synthase
EK_CAPAA	AJ005588	Capsicum annuum (Red pepper)	5-epi-aristolochene synthase
V5_CAPAN	AF061285	Capsicum annuum (Bell pepper)	5-epi-aristolochene synthase-like
BH_CAPAN	AF212433	Capsicum annuum (Bell pepper)	5-epi-aristolochene synthase-like

		<b>Group D3</b>	
BR_PERFR	AY917195	Perilla frutescens (Beefsteak plant)	Valencene synthase
78_PERFR	AY917194	Perilla frutescens (Beefsteak plant)	Putative sesquiterpene synthase
72_9LAMI	AY508728	Pogostemon cablin (patchouli)	(+)-Germacrene A synthase
RE_MARVU	AJ291755	Marrubium vulgare (White horehound)	Putative terpenesynthase-1
		<b>Group D4</b>	
UW_MENPI	AJ786642	Mentha piperita (Peppermint)	(E)-beta-farnesene synthase
RV_MENPI	AF024615	Mentha piperita (Peppermint)	(E)-beta-farnesene synthase
IZ_MENPI	AJ786641	Mentha piperita (Peppermint)	(Z)-Muurolo-3,5-diene synthase
NG_OCIBA	AY693645	Ocimum basilicum (Sweet basil)	Gamma-cadinene synthase
QI_9LAMI	AY508726	Pogostemon cablin (patchouli)	Gamma-curcumene synthase
		<b>Group D5a</b>	
2B_ARATH	AL022224	Arabidopsis thaliana (Mouse-ear cress)	Terpene cyclase like protein (unreviewed, ?)
4N_ARATH	AC026480	Arabidopsis thaliana (Mouse-ear cress)	Putative terpene synthase/cyclase (unreviewed, ?)
Z6_ARATH	AB026657	Arabidopsis thaliana (Mouse-ear cress)	Terpene cyclase (unreviewed, ?)
3L_ARATH	AL022224	Arabidopsis thaliana (Mouse-ear cress)	Cadinene synthase like protein (unreviewed, ?)
RM_ARATH	AB018121	Arabidopsis thaliana (Mouse-ear cress)	Cadinene synthase-like protein (unreviewed, ?)
6V_ARATH	AC073555	Arabidopsis thaliana (Mouse-ear cress)	Terpene cyclase, putative (unreviewed, ?)
		<b>Group D5b</b>	
93_ARATH	Y11187	Arabidopsis thaliana (Mouse-ear cress)	Terpene cyclase, TC1 (unreviewed, ?)
DQ_ARATH	AC002391	Arabidopsis thaliana (Mouse-ear cress)	Putative vetispiradiene synthase (unreviewed, ?)
ZS_ARATH	AY876386	Arabidopsis thaliana (Mouse-ear cress)	(+)-Alpha-barbatene synthase
UPI00000E		Arabidopsis thaliana (Mouse-ear cress)	(Z)-gamma-bisabolene synthase (unreviewed, paper support)

C9		<b>Group D5c</b>	
R8_ARATH	AF497488	Arabidopsis thaliana (Mouse-ear cress)	Terpene synthase (unreviewed, ?)
L5_ARATH	AP002068	Arabidopsis thaliana (Mouse-ear cress)	5-epi-aristolochene synthase-like protein; terpene synthase (unreviewed, ?)
KF_ARATH	AC010164	Arabidopsis thaliana (Mouse-ear cress)	F14M2.13 protein (unreviewed, ?)
5Z_ARATH	AB023038	Arabidopsis thaliana (Mouse-ear cress)	Vetispiradiene synthase (unreviewed, ?)
DM_ARATH	AF497489	Arabidopsis thaliana (Mouse-ear cress)	Terpene synthase (unreviewed, ?)
NK_ARATH	AC074309	Arabidopsis thaliana (Mouse-ear cress)	Terpene synthase family protein, putative (unreviewed, ?)
8M_ARATH	AF497486	Arabidopsis thaliana (Mouse-ear cress)	Terpene synthase (unreviewed, ?)
M6_RICCO	L323134	Ricinus communis (Castor bean)	Casbene synthase, chloroplastic
		<b>Group D6</b>	
Y3_ARTAN	DQ447636	Artemisia annua (Sweet wormwood)	Germacrene A synthase
KZ_LACSA	AF489965	Lactuca sativa (Garden lettuce)	Germacrene A synthase LTC2
97_9ASTR	DQ186657	Crepidiastrum sonchifolium	Germacrene A synthase
D7_CICIN	AF498000	Cichorium intybus (Chicory)	(+)-Germacrene A synthase
N8_LACSA	AF489964	Lactuca sativa (Garden lettuce)	Germacrene A synthase LTC1
6W_HELAN	EU327785	Helianthus annuus (Common sunflower)	Germacrene A synthase 2
Z6_HELAN	DQ016667	Helianthus annuus (Common sunflower)	Germacrene A synthase 1
U3_CICIN	AF497999	Cichorium intybus (Chicory)	(+)-Germacrene A synthase
Q6_9ASTR	AY082672	Solidago canadensis	(+)-germacrene A synthase

7D_9ASTR	AY673673	Solidago canadensis (Goldenrod)	Cascarilladiene synthase
RK_ARATH	AF497491	Arabidopsis thaliana (Mouse-ear cress)	(-)-(E)-beta-caryophyllene (80)/alpha-humulene synthase

### S3. Problematic plant sesquiterpene synthase sequences

The following sequences were shown to have various problems that should be noted for future analysis of this protein family.

Short ID	GenBank ID	Problem
2B_ARATH	AL022224	Large deletion after residue 403
OU_GOSAR	AF174294	Large deletion after residue 330
5T_ARATH	AL049608	Large deletion after residue 436
3R_ARATH	AP002062	Large deletion after residue 436
HZ_ORYSJ	AP004560	Large insertion after residue 395
YZ_VITVI	CU459241	Truncated at C-terminal residue 541
SE_ORYSJ	DP000009	Deletion after residue 467
4A_ORSYJ	CM000128	Large deletion after residue 484
KE_TOBAC	AF272244	Deletion of first 3 motifs at N-terminus
8Y_SOLLC	AF171218	Deletion of first 3 motifs at N-terminus

S4. Multiple Sequence Alignment. Other formats are available upon requests to the authors (email: [wymore@psc.edu](mailto:wymore@psc.edu))

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>P1;7P_VITVI
  Length = 775
-----M
VLILATSNGS SSAPVANPGT NRRTANYQPS IWGNSFIVSN TPEDEITL-- -AHKEQQLED
LKEVVIRELI AAASHPLE-- -----Q LKFIDAVQRL GVAYHFEKEI EEALQNTYDN
YH----- CIDDINDDLY DVALRFRL-R QQGFNI--SC DI--FN-KFT DERGRFKEAL
IS----- ---DVRGMLG LYEAHLRVH GE--DILAKA LAFTTTHLKA MV-----
ESLGYHLAEQ VAHAL-NRPI RKGLERLEAR WYIS-VYQDE AFHDKT---- -----LLE
LGKLDNFLVQ SLHKEELSNL ARWWKELDF- ATKL-PFARD RLVEGYFWMH G-VYFEPQYL
RGRRILTKVI AMTSILDDIH DAYGTPEELK LFIEAIERWD --IN-SINQL P-EYMKLCYV
ALLDVYKEIE EE--MEKEGN QYRVHYAKEV MKNQVR---- -----
----- AYFAEAKWLH EE-HVP---A FEEYMRVALA SSGYCLLATT SFVGMGEI--
-ATKEAFDWV TSD---PKIM SSSNFITRLM DDIKSHKFEQ -KR-GHVASA VECYMKQYGV

-SEEQVYSEF RKQIENAWLD INQECLKP-- -TAVSM--PL LARLLNLTRT MDVIY--KEQ
-DS-YTHVGK -VMRDNIASV FINAVI----- -----*
>P1;YK_VITVI
  Length = 775
-----
---MSTQVSA SSLAQIPQPK NRPVANFHPN IWGDQFITYT PEDKVTRA-- -CK-EEQIED
LKKEVKRKLK AAVANPS-- -----QL LNFIDAVQRL GVAYHFEQEI EEALQHICNS
FH----- DCNDMDGDLY NIALGFRLLR QQGYTI--SC DI--FN-KFT DERGRFKEAL
IS----- ---DVRGMLG LYEAHLRVH GE--DILAKA LAFTTTHLKA MV-----
ESLGYHLAEQ VAHAL-NRPI RKGLERLEAR WYIS-VYQDE AFHDKT---- -----LLE
LAKLDNFLVQ SLHKEELSNL ARWWKELDF- ATKL-PFARD RLVEGYFWMH G-VYFEPQYL
RGRRILTKVI AMTSILDDIH DAYGTPEELK LFIEAIERWD --IN-SINQL P-EYMKLCYV
ALLDVYKEIE EE--MEKEGN QYRVHYAKEV MKNQVR---- -----
----- AYFAEAKWLH EE-HVP---A FEEYMRVALA SSGYCLLATT SFVGMGEI--
-ATKEAFDWV TSD---PKIM SSSNFITRLM DDIKSHKFEQ -KR-GHVTSA VECYMKQYGV
-SEEQVYSEF QKQIENAWLD INQECLKP-- -TAVSM--PL LARLLNFTRT MDVIY--KEQ
-DS-YTHVGK -VMRDNIASV FINAVI----- -----*
>P1;UG_VITVI
  Length = 775
-----
---MSGQVLA SPLGQFPELE NRPVVQYHPS IWGDQFLSYT PEDEVTRA-- -CK-EKQLED

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LKEEIRRKLM NTAGNTSQ-- -----Q LKFIDAVQRL GVAYHFEREI EEVLQHIYDS  
YP----- NGDDMEGDIY NVALQFRLLR QAGFNI--SC GL--FN-EFK DEKGNFKKAL  
VS----- ---DVRGMLG LYEAHLRVH GE--DILAKA LAFTTTHLKA MV-----  
ESLGYHLAEQ VAHAL-NRPI RKGLERLEAR WYIS-VYQDE AFHDKT---- -----LLE  
LAKLDFNLVQ SLHKEELSNL ARWWKELDF- ATKL-PFARD RLVECYFWML G-VYFEPQYL  
RARRILTKVI AMISILDDIH DAYGTPEELK LFIEAIERWD --IN-SIDQL P-EYMKLCYA  
ALLDVYKEIE EE--MEKEGN QYRVHYAKEV MKNQVR---- -----  
----- AYFAEAKWLH EE-HVP---T FEEYMRVALV SSGYCILATT SFVGMGEI--  
-ATKEAFDWV TSN---PKIM SSSNFIARLM DDIKSHKFEQ -KR-GHVASA VECYMKQYGV  
-SEEQVYKEF QKQIENAWLD INQECLKP-- -TAVSM--PL LARILNLTRA ADVVY--KEQ  
-DS-YTHVGK -VMRDNIASV LINAVI---- -----\*  
>P1;EZ\_VITVI

Length = 775

----- ----- ----- ----MELAKL FLSYLPPIHHS RYSAVLSLSQ  
GINMSTQVSA CSLAQIPKPK NRPVTNFHPN IWGDQFITYT PEDKVTRA-- -CK-VEQIED  
LKKEVKRKLTAATANHS--- -----LL LNFIDAVQRL GVAYHFQEIE EEALQHIYES  
FH----- DLNDIDGDLY NVALGFRLLR QOGYSI--SC GI--LK-KFT DERGRFKEVL  
IT----- ---NVRGLLG LYEAHLRVH GE--DILAEA LTFTTTHLKA MV-----  
ESLGYPLAEQ VVHAL-NRPI RKGLERIEAR WYIS-VYQDE AFHDKT---- -----LLE  
LAKLDFNLVQ SLHREELSNL ARWWKELDF- ATKL-PFARD RLVEGYFWIL G-VYFEPQYL  
RARRILTKVI AMTSILDDIY DAYGNPEELK LFTEAIERWD --IN-SIDQL P-EYMKLCYA  
ALLDVYKEIE EE--MEKEGN QYRVHYAKEV MKNQVR---- -----  
----- AYFAEAKWLH EE-HVP---T IEEYLRVALV SSGYCM LATT SLVGMGEI--  
-ATKEAFDWV TSD---PKIM SSSNFIARLM DDISSHKFEQ -KR-EHVASA IECYMKQYGV  
-SEEQAYSEF RKQIENAWMD INQECLKP-- -TAVPM--PL LARVLNLTRA ADVIY--KEQ  
-DS-YTHVGK -VMKNNIAAF FINPII---- -----\*  
>P1;84\_VITVI

Length = 775

----- ----- -----  
---MSIQVST CPLVQIPKPE HRPMAEFHPS IWGDQFIAYT PEDEDTRA-- -CK-EKQVED  
LKAEVRRLEMAAAGNPAQ-- -----L LNFIDAVQRL GVAYHFEREI EESLQHIYDR  
FH----- DADDTEDDLY NIALQFRLLR QOGYNI--SC GI--FN-KFK DEKGSFKEDL  
IS----- ---NVOGMLG LYEAHLRVH GE--DTLEEA LAFTTTHLKA TVE-----  
SFRDILLQNK LPHAL-KHPI RKGLERLEAR WYIS-LYQDE ASHDKT---- -----LLK  
LAKLDFNLVQ SLHKEELSNL ARWWKELDF- ATKL-PFARD RFVEGYFWTL G-VYFEPQYS  
  
CARRILTKLF AMASIIDDIY DAYGTLEELQ PFTEAIERWD --IK-SIDHL P-EYMKLFYV  
TLLDLYKEID QE--LEKYGN QYRVYYAKEV LKSQVR---- -----  
----- AYFAEAKWSH EG-YIP---T IEEYMLVALV TSGSCILATW SFIGMGEI--



-MTKEAFDWV ISD---PKII TASTVIFRLM DDITTHKFEQ -KR-GHVASG IECYMKQYGV  
-SEEQVYSEF HKQVENAWLG INQECLKP-- -TAVPM--PL LTRVVNLSRV MDVIY--KEG  
-DG-YTHVGK -VMKDNIGSV LIDPIV----- -----\*  
>P1;6X\_VITVI

Length = 775

-----  
---MSIQVST CRLVQIPKPE NRPRAEFHPS IWGDQFIAYT PEDEVSRA-- -CK-EKQVED  
LKEEVRRELM AAAGNPSQ-- -----L LNFIDAVQRL GVAYHFEREI EESLQHIYDR  
FH----- DADDTNDDLY NIALRFLLR QQGYNI--SC GI--FN-KFK DEKGSFKEDL  
IS----- --NIQMLG LYEAAHLRVH GE--DILEEA LSFTTTHLKA TV-----  
ESLGYPLAEQ VSHAL-KHPI RKGLERLEAR WYIS-LYQDE ASHDKT---- -----LLK  
LAKLDFNLVQ SLHKEELSNL ARWWKELGF- ATKL-PFARD RLVEGYFWIV G-VYFEPQYL  
WAIRILTKII VMTTVIDDIY DAYGTLEEIK HFTEAIERWD --IN-SIDHL P-KYMKLFYV  
ALLDVYKEIE EE--MEKERH QYRVHYAIDA MKNQVR---- -----  
----- AYFAEAKWFH EQ-HIP---T MEEYMRVALL SSGYSLLATS SFIGMGEI--  
-VSKEAFDWV ISD---PKII RASTVIARFM DDMTSHKFEQ -ER-GHVASG IECYMKQCGV  
-SEEQAYKEF HNQIVNAWMD INQECLKP-- -TAVPM--PL LTRVLNLSRV MDVIY--KEG  
-DG-YTHVGK -VMKDNIGSV LIDPII----- -----\*  
>P1;KR\_VITVI

Length = 775

-----  
---MSGQVLA SPLGQFPDLE NRPVVKYHPN IWGDQFLSHT PEDEVTRA-- -CK-EKQLED  
LKEEIRRKLM NTAGNTSQ-- -----Q LKFIDAVQRL GLAYHFEREI EEVLQHIYDS  
YP----- NGDDMEGDIY NVALQFRLLR QAGFNI--SC GL--FN-EFK DEKGNFKKAL  
IS----- --DVRGMLG LYEAAHLRVR GE--DILDEA LAFTTTHLRS MV-----  
EHLEYPFAEQ VVHAL-KQPI RRGLERLEAR WYIS-IYQDE TSHDRT---- -----LLK  
LAKLDFNLVQ SLHKEELSNL SRWWKKLDF- ATKL-PFARD RLVECYFWIL G-FYFEPQYV  
WARRILTKTI ALTSTMDDIY DAYGTFEELK LFTAAIERWD --IN-SIDHL P-EYMKHFYV  
ALLDVYKEIE EE--MEKEGN QYRVQYAIEA MKNQAR---- -----  
----- AYFHEAKWLH EG-RIP---T VEEYMSVAQV SSGDSMLTIT SFIGMGKI--  
-VTKEAFDWV ITN---PKIV TASSVISRLM DDITSHKFEQ -KR-GHVASG VECYMKQYGA  
-SEEEVDYDF QKQVEDACKD INEEFLRP-- -TAVPM--PL LMRVLNLSRV MYVIY--TGG  
-DG-YTHVGK -VMKNNVASL LIHPIA----- -----\*  
>P1;1Q\_VITVI

Length = 775

-----M  
ALILATSNGS SPAPVANSET TRRTANYQPS IWGNSFIVSN TPEDEITL-- -AHKEQLED  
LKEEVRRELI AAASNPSK-- -----Q LKFIDAIQRL GVAYHFENEI EQALQSTYDN  
YH----- GIADINDDLY DVALRFLLR QQGFNI--SC DI--FK-RYK DEKGRFKKSL

IN----- ---DPYGLLG LYEAHLRVV EE--DILDEA LPFTTTHLKS IV-----  
EHLEYPLAAQ VTHAL-ERPI RKGLERLEAR PFMS-IYQDE ASHKA---- -----LLK  
FAKLDFNLLQ SLYKKELSNI SRWWKDLDF- SSKL-PFARD RLVEGYFWIA T-CCFEPQYS  
YARRIQTKLH ALITTMDDMF DAYGTFFEELE LFTEAIGRWD --IN-SVHQL P-EYMKPCYQ  
AVLDVYKEIE E---MENTER SYCVHHTKDA IKSLVQ---- -----  
----- AYLVEAKWLH GK-YIP---T IEEYMGIAMV TVGVPVLTIM SFIGMRET--  
-ATKEVFDWL LQN---PKIV RATYIIIIRLM DDMASHKFEQ -ER-EHIASS IECYMKQHGV  
-SEQQAYDEF HKQ TENAWKD INEECLRP-- -TTVPM--LL LSRLLN FARS GDVMY-KSHK  
-DI-FTHPGE -VTKNNISML LIDPVPI--- -----\*  
>P1;T1\_VITVI

Length = 775

-----M  
ALILATS DMS SPAPVANPET NRRTANYQPS IWGNSFIVSN TPEDEITL-- -AHKEQQLED  
LKEEVRRELM AAASNPSK-- -----Q LKFIDAVQRL GVAYHFEKDI EEALQNTYDN

YH----- CIDDINDDL Y VALRFLLR QOGFNI--SC DI--FK-RYK DEKGRFKESL  
IN----- ---DPCGLLG LYEAHLRVV EE--DILDEA LAFTTAHLKS MV-----  
EHLEYPLAAQ VTHAL-DRPI RKGLERLEAR PFMS-IYQDE ASHKA---- -----LLK  
FAKLDFNLLQ SLYKKELSNI SRWWKDLDF- SSKL-PFARD RLVEGYFWIA I-SCSEPQYS  
YARRIQTKVV ALITTVDDIF DAYGTFFEELE LFTEAIERWD --IN-SIDQF P-EYLKPCYQ  
AVLDVYKEIE E---MENTER SYCVHHTKDA IKSLFQ---- -----  
----- ANLVQAKWFR GK-YIP---T IEEYMGIAMV TVGVPPLTIM SFIGMRET--  
-ATKEVFDWV QQN---PKIV RAASTVMRLM DDMASHKFEQ -ER-GHNASS IECYMKQHGV  
-SEQQAYDEL HKQ IENAWKD INEESLRP-- -TAVPM--LL LSRLLN FARS GDVMY-KGHK  
-DM-FSHPEE -VMKNDISML LIDPVPI--- -----\*  
>P1;K0\_VITVI

Length = 775

----- MLSARVSLHM  
ALILATSNGS SPAPVANPET NRRTANYQPS IWGNTFIVSH TPEDEITL-- -AHKEQQLED  
LKEEVRRELM AAASNPSK-- -----Q LKFIDAVQRL GVAYHFEKEI EEALQNTYDN  
YH----- CIDDINDDL Y VALRFLLR QOGFNI--SC DI--FN-RYT DEKGRFKESL  
IN----- ---DACGLLG LYEAHLRVG EE--DILDEA LAFTTTHLKS MV-----  
EHLEYPLAAQ VTHAL-YRPL RKGLERLEAR PFMS-IYEDE ASHKA---- -----LLK  
LAKLDFNQLQ SLYKKELSNI LGWWKDLDF- SSKL-PFVRD RLVEGYFWIA T-ACFEPQYS  
YARRIQTKLH ALITTTDDIF DAYGTLEELE LFTEAIGRWD --ID-STHQL P-EYMKPCYQ  
AVFDAYKEIE E---MENTER SHSVHKAKDA MKNLVQ---- -----  
----- AYLVEAKWFH GK-YIP---T IEEYMRVALV SIGAPVLTFI SFIGMGEI--  
-ATKEVFDWL QQN---PKIV RASSKVIRLM DDMATHKFEQ -ER-GHIASS IECYMKQHGV  
-SEQQAYGEF HKQ LENAWKD INEECLKP-- -TAVPM--LL LSRLLN FARA ADVMY-KGQK

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-DE-FTHLGE -VMKNNISML LIDPVPI--- -----*
>P1;Q4_VITVI
  Length = 775
-----
MSVLSNMSSH SLAONYKPEV KRPMVNFHPG IRGNPFINYT PDDEITRA-- -YN-QKQVED
LKDEVRREQ L AAAGKPSQ-- -----Q LNFIDAIQRL GVAYHFEEEI EEALRHICDD
HH----- YSDDKYDDL Y NVSLRFLLR QOQYNI--SC DV--FN-KFK DKNGSFRESL
IG----- ---DVQGLG L YEAAHLRVQ EE--DILDEA LAFTTTHLKS LV-----
KHLDHPLAVQ VTQAL-HRPI RKGLERLEAR PYIF-IYQDE ASHKA---- -----LLK
LAKLDFNLLQ SLYKKELSHI TRWWEDLDF- SSSL-PFVRD RVVETYLWIV V-ACFEPQYS
YARRIQT KLL VLITVIDDIY DAYGTLEELE LFTEAIERWD --NN-GIEKL P-EYMKPCYL
AVL DAYKEIE E---KENEER SYCVHYAKEA MKNSVR---- -----
----- AYFNEAKWLH GE-YVP---T VEEYMGVALV SCDVPMFTII SFVGMGFI--
-ATKEAFDWV LNG---PKIV RACSTIIRLM DDMASHKFEQ -ER-GHIASS VECYMKQYSV
-SEQLAYHEL NKQVEKAWKD INQEFLRP-- -TAIPM--PL LTRVLNFART GDFMY-KGRE
-DI-FTNVGE -VMKDNVASL FIDPVP M--- -----*
>P1;RW_VITVI
  Length = 775
-----
----- -MSSHLSAEV KRPVVSFRSS IWGNRFINYT PDDEITRA-- -YN-QQRVED
LKEEVKRELM VAAGKPSQ-- -----H LNFIDAVQRL GMAYHFEEEI EEAI GHIYDN
YH----- HSDDKYDDL C NVSLRFLLR QOQYNI--SC DI--FE-RFK DENG SFKECL
NN----- ---DVEGMLG L YEAAHLRVQ EE--DILDEA LAFTTAHLES LV-----
EDLDYPLAAQ ATQAL-YRPI RKGLERLEAR PHIS-IYQDE ASHKA---- -----LLE
LAKLDFNLLQ SLYKKELSYI TRWWKDLDF- SSKL-PFVRD RVVETYLWIV A-ECFEPQYS
YARRIQT KLL VLITVIDDVY DAYGTLEELE LFTEAIERWD --NN-SIDSL P-EYMKPCYQ
AVLDVYKEIE E---KENEER PYCVHYAK-- KASYL----- -----
----- SYFNEGKWLH AE-YVP---T MEEYMGVALV SSDVPMFTII SFVGMGMM--
-ATKEAFDWV LNG---PKIV RACSTIVRLM DLKY YFQNA A -YS-YLKSKG VECYMKQNSV
-SEQLAYREL NKQVEKAWKD INQEFLRP-- -TAIPM--HL LTRVLNFART GEFMY-KVRE
-DR-FTNVGE -VLKDNIASL FIDPVSI--- -----*
>P1;QT_VITVI
  Length = 775
-----M
SVSLPVTPIP TTPGVDHOGV ARSTANFPPN IWGDRFLIYT PDDAITHE-- -CK-EQQIEE
LKEEVRKELK ASASKSPE-- -----L LKLIDSIQLL GLAHHFEREI EEALKDMYGT
Y----- SLVDDNDDFT NASLRFLLR QEGYPI--PS DV--FN-KFK DKEGNFKEYL
IG----- ---DSLGMLA L YEATHLMVH GE--DILEEA LAFTTTHLQS MA-----
TDPNNPLAKQ VIRAL-KRPI RKGLTRVEAT HYIS-IYQQD GSHNKS---- -----LLK

```

LAKLDFNLLQ SLHRKELSEI SRWWKGLDV- ATKL-PFARD RLVESYFWTL G-VYFEPQYF  
PARRFLTKMT AMLTIMDDIY DAYGTIEELE LLTEAVERWD --AS-CIDQL PADYMKWFYR  
ALLDVYEEME EE--MAKEGK LYRVHYAKEA MKRQIQ---- -----  
----- AYFIEAKWLN QR-YVP---T FDEYISNTLV SCGYTLLIAT SFVGMGDV--  
-VTEEAFQWV LSH---AKMI RASETISRML DDLVSHEFEQ -TR-MHAPSS IECYMKQYEV  
-TKQEACDEL NKQIVRAWKD INQECLRP-- -TQVPM--PL VTRVLNFSRV IDILY--KDE  
-DE-YTHNGK -LIKDLITWM LIDPVPM--- -----\*  
>P1;S0\_VITVI

Length = 775

-----M  
SVSLPVTPIP TTQRVHHQEV ARSTANYPPN IWGDRFLTYA PDDTVTQE-- -CK-AQKIKE  
LKEEVRKELK ASAHKSPE-- -----L LKLIDSIQLL GLTYHFEREI EEALKDMYGT  
Y----- SLVDDNEDLT NASLRFLLR QEGYXV--PS DV--FS-KFK DKEGNFKXSL  
IG----- ---DLPGLA LYEATHLMVH GE--DILEEA LAFTTAHLQS VA-----  
TDPNNPLSKQ VIRAL-KLSI HNGVTSVGAR HYIS-IYQED GSHNES---- -----LLK  
LAKLDFNLLQ SLHRKELSEI TRWWKGLDF- ATKL-PFARD RLVEIYFSAL G-VCFEPQYS  
LSLRFLLTKVA IMITMVDDIY DAYGTIEELT LLTEAIERWD --AS-SIDQL P-DYMKCFYR  
ALLDLYEEME QE--MAKEGK LYRVHYAKEL MKKQIQ---- -----  
----- SYFVEAKWSN QG-YIP---T FDEYMSNGVV SGCCSLLIAT SFVGMGDI--  
-VTKESFQWV LSR---PTMI GASQIICRLM DDMASHEFEQ -KR-VHVASS VECYMKQYGV  
-SKQEAYDEL NKQVVKAWKD INQECLKP-- -TPVLM--PI ITRVLNIARM MNILY--KDG  
-DE-FTHVGK -QRKDLIASI LIDPVPIEIK QAASLSSCVM DLGINGSSTK TELKL\*  
>P1;Y3\_VITVI

Length = 775

-----  
MSLPLSVTAP IPTQRLNPEA ARRSANFRPC FWGDRFLTYT PADPVTHA-- -RK-VQQIEE  
LKDELRLNELK ATARKSSQ-- -----L LNFIDSIQRL GLAYQFEREI KEALEDMYQT  
YN----- LDDDDNDDLT NASLRFLLR QEGYHI--PP DV--FN-KFK DDEGNFKESL  
TG----- ---DLPGLA LYEATHLMVH GE--DILEEA LAFSTAHLQS MA-----  
TDSTHPLAAQ VTRAL-KRPI RKCLTRVEAR HYIS-VYQED GPHNKT---- -----LLK  
LSKLDNFLLQ SLHRKELSEV TRWWKGLNF- AKKM-PFARD RLVEGYFWIL G-VYFEPQYS  
LARRILIKVL AMISIIDDIY DAYGTFEELK LFTEAIERWD --AN-SVNQL P-DYMKPCYQ  
ALLDVYEEME EE--MAKEGN LYRVQYAKAA IERQIQ---- -----  
----- AYFVEAKWLN QE-YTP---T LDEYMSNALI SSGYSMLMTT SFVGMGDI--  
-ATKEAFDWV FND---PKMV RASSVICRLM DDIVSHEFEQ -KR-GHVASA VECYMKQHGV  
-CKQEAYDEL NKQVVNAWKD MNKECLKP-- -TQVPM--PL LTRVLNFSRV IDILY--KDE  
-DQ-YTHVGK -LMKDLIASI LIDPVPI--- -----\*  
>P1;XQ\_VITVI

Length = 775

```

-----M
SVPLSVSVTP ILSQRIDPEV ARHEATYYPN FWGDRFLHYN PDDDFCGTHA --CKEQIQE
LKEEVRKSLE ATAGNTSQ-- -----L LKLIDSIQRL GLAYHFEREI EEALKAMYQT
Y----- TLVDDNDHLT TVSLLFRLLR QEGYHI--PS DV--FK-KFM DEGGNFKESL
VG----- ---DLPGLA LYEAHLMVH GE--DILDEA LGFTTAHLQS MA-----
IDSDNPLTKQ VIRAL-KRPI RKGLPRVEAR HYIT-IYQED DSHNES---- -----LLK
LAKLDYNMLQ SLHRKELSEI TKWWKGLDF- ATKL-PFARD RIVEGYFWIL G-VYFEPQYY
LARRILMKVF GVLSIVDDIY DAYGTFEELK LFTEAIERWD --AS-SIDQL P-DYMKVCYQ
ALLDVYEEME EE--MXKQ GK LYRVHYAQAA LKXQVQ---- -----
----- AYLLEAKWLK QE-YIP---T MEEYMSNALV XSACSMLETTT SFVGMGDY--
-VTKEAFDWV FSD---PKMI RASNVICRLM DDIVSHEFEQ -KR-GHVASA VECYMKQYGV
-SKEEAYDEF KKQVESAWKD NNEEXLQP-- -TAVPV--PL LTRVLNFSRM XDVLY--KDE
-DE-YTLVGP -LMKDLVAGM LIDPVP--- -----*

```

>P1;3B\_9LAMI

Length = 775

```

-----
-----MDLNEITSS SRPLANYHPN VWGDRFLLHE PEFTCQAG-- -E--KQLVEE
LKEEVRRELK EASNDYLR-- -----Q LKMVDALQRL GIEYLFEEI DEALRNLLAK
FE----- NYCKDNHDMY ATALSFRLLR QHGYKV--SC EV--FD-KFK DGEDGFKVE-
----- ---EVMAVLE LFEATHMRIH GE--DVLDQA FVFTRNYLQS IH-----
ATLSNPIAKQ VHNALNGYSC RRGMPRIEAR KYIP-IYEEY GCHHKA---- -----LLK
LAKLDFNLLQ SMHKRELTLQ YRWWKDLEM- PTKL-PYIRD RLVETYFWDM G-FYFEPQYA
LARNILVKVQ CLVSIFDDTF DAYGAFKELQ LFKDAIDRWS --IS-CLDEL P-EYMQIIYK
LVLDVFEEIE SH--MIKQGT SYRLDYAREA IKIVIG---- -----
----- GYFDEAKWRE EE-YKP---R MEEYMKVATK SAAYLTLIIV SFVGMKND--
IATPQAFQWV LSE---PQII TASLALARLS NDLVGIEFEK -ER-KYIATA VELYEEHVKV
-SKEEAVLEL RHETESAWKE INEALLEP-- -TTFAT--PI LDRILNSARV LEVIFY--DKT
-DR-YTHVDL -ELQNIIAQL YIHPIP---- -----*

```

>P1;FK\_9LAMI

Length = 775

```

-----
-----MELKN QSVAIISSNA SRPLAHYHPD VWGDRFLLYK PNPSSSEAG-- -Q--KPVIEE
LKQQRSELK EASNDYMR-- -----Q LKMVDALQRL GIESLFEEDI DNALKNLSEN
FD----- DYCKDKHDLY AIALSFRLLR QHGYRI--SC DV--FD-KLK DGEDGFKVPP
SD----- ---EALAVVE LLEATHLRIH GE--VVDLRA FVFARIHLES IE-----
ANLNNPVAQV VHNALYGYSN RRGMQQVEAR KYIP-IYEQY ASHQG---- -----LLK
LATLNFNLQV TMHKRELSEL SRWYRDLEV- PTML-PFARQ RLVETYFWDA G-VVFEPEPEND
VARMILVKVQ CLISFLDDTF DAYGSFEELQ LFTDAINTWD --VS-CLDQL P-DYMKIIYK
ALLGVFEVIE KL--MIKQGT LYRLNYAKEA MKIVVG---- -----

```

----- GYFVEAKWRE EK-SKP---T TOEYMQVATK SAGYMTLIIT SFLGMEAN--  
IATKEAFDWV LSE---PDVM KAAITLARLT NDIVGIELEK -ER-KHIATA VEVYEDEHKL  
-SMQEAMVEI KNOIESGWKT INEAFLRP-- -TKFPT--PI LYRILNYCRV LEVIY--DKS  
-DR-YTHVDP -ALQDIIKQL YIHPIP----- -----\*

>P1;73\_9LAMI

Length = 775

-----  
--MELYAQS- ----VGVGAA SRPLANFHPV VWGDKFIVYN PQSCQAGE-- ----REEAEE  
LKVELKRELK EASDNYMR-- -----Q LKMVDAIQRL GIDYLFVEDV DEALKNLFEM  
FD----- AFCKNNHDMH ATALSFRLLR QHGYRV--SC EV--FE-KFK DGKDGFKVPN  
ED----- ---GAVAVLE FFEATHLRVH GE--DVLDNA FDFTRNYLES VY-----  
ATLNDPTAKQ VHNALNEFSF RRGLPRVEAR KYIS-IYEQY ASHHKG---- -----LLK  
LAKLDFNLVQ ALHRRELSER SRWWKTLOV- PTKL-SFVRD RLVESYFWAS G-SYFEPNYS  
VARMILAKGL AVLSLMDDVY DAYGTFEELQ MFTDAIERWD --AS-CLDKL P-DYMKIVYK  
ALLDVFEEDV EE--LIKLGA PYRAYYGKEA MKYAAAR---- -----  
----- AYMEEAQWRE QK-HKP---T TKEYMKLATK TCGYITLIIL SCLGVEEG--  
IVTKEAFDWV FSR---PPFI EATLIIARLV NDITGHEFEK -KR-EHVRTA VECYMEEHKV  
-GKQEVVSEF YNQMESAWKD INEGFLRP-- -VEFPI--PL LYLILNSVRT LEVIY--KEG  
-DS-YTHVGP -AMQNIKQL YLHPVPY--- -----\*

>P1;DC\_9MAGN

Length = 775

-----  
---MENQKVP ISSVPNLDEL SRPIANFPPS IWGDRFINYA CEDENEQAQ- ---KERQVEE  
LKEQVRRELA ATVQKPLQ-- -----Q LNIIDATQRL GIAYHFENEI EESLEHIYLN  
TYVEN----- NCFQGSMDLY SVALWFRLLR QDGYKV--SC DV--FD-KFR DYEDNFKNSL  
ME----- ---DAKGLLE LYEATHLSVH GE--EMLDDA LEFAKTRLES IVN-----  
-HLNYPLAEQ VRHAL-YRPL RKGLPRLEAV YFFR-IYEAY DSHNKA---- -----LLK  
LAKLDFNLLQ SLHKKELSDM ARWWKSLDF- AAKF-PFARD RLVEGYFWVL G-VYFEPQYS  
LARKIIKVF TMISTIDDIY DAYGTLDELE LFTKAMQRWD --VG-SLDQL P-EYMKPCYK  
SILDVYNEIE EE--MDNQGS LFRMHYAKEV MKKLVEG--- -----  
----- -YMDEAKWCH EK-YVP---T FEEYMPVALV TSGYTFLTTI SYLGMGE---  
IASKEAFDWL FSH---PPVI EASESVCRLM DDMRSHKFEQ -ER-GHVASG IECYMKQYGV  
-TEEEAHDEF RKQLVKAWKD INEECLRP-- -YRVPK--PL LMRILNLTRV IDVIY--KNE  
-DG-YTHVKK -AMKDNIASL LIDPMIV--- -----\*

>P1;A0\_GOSHI

Length = 775

-----  
---QVSQMPS SSPLSSNKDE MRPKADFQPS IWGDFFLNCP DKNIDAET-- ----QKRHQQ  
LKEEVRKMIV APMANSTQ-- -----K LAFIDSVQRL GVSyhFTKEI EDELENIYH-

----- NNDAENDLY TTSLRFLLR EHGfNV--SC DV--FN-KFK DEQGNFKSSV  
TS----- ---DVRGLLE LYQASYLRVH GE--DILDEA ISFTSNHLSL AV-----  
ASLDHPLSEE VSHAL-KQSI RRGLPRVEAR HYLS-VYQDI ESHNKV---- -----LLE  
FAKIDFNMVQ LLHRKELSEI SRWWKDLDF- QRKL-PYARD RVVEGYFWIS G-VYFEPQYS  
LGRKMLTKVI AMASIVDDTY DSYATYEELI PYTNAIERWD --IK-CIDEL P-EYMKPSYK  
ALLDVYEEME QL--VAEHGR QYRVEYAKNA MIRLAQ---- -----  
----- SYLVEARWTL QN-YKP---S FEEFKANALP TCGYAMLAIT SFVGMGDI--  
-VTPETFKWA AND---PKII QASTIICRFM DDVAEHKFKH -RR-EDDCSA IECYMEEYGV  
-TAQEAYDVF NKHVESAWKD VNQEFLKP-- -TEMPT--EV LNRSNLARV MDVLY--REG  
-DG-YTYVGK -AAKGGITSL LIEPIAL--- -----\*  
>P1;DC\_GOSHI

Length = 775

-----  
MASQVSQMPS SSPLSSNKDE MRPKADFQPS IWGDFFLNCP DKNIDAET-- ----QKRHQQ  
LKEEVRKMIV APMANSTL-- -----K LAFIDSVQGL GVSYHFTKEI EDELENIYH-  
----- NNDAENDLY TTSLRFLLR EHGfHV--SC DV--FN-KFK DEQGNFKSSV  
TS----- ---DVRGLLE LYQASYLRVH GE--DILDEA ISFTSNHLSL AV-----  
ASLDHPLSEE VSHAL-KQSI RRGLPRVEAR HYLS-VYQDI ESHNKV---- -----LLE  
FAKIDFNMVQ LLHRKELSEI SRWWKDLDF- QRKL-PYARD RVVEGYFWIS G-VYFEPQYS  
LGRKMLTKVI AMASIVDDTY DSYATYEELI PYTNAIERWD --IK-CIDEL P-EYMKPSYK  
ALLDVYEEME QL--VAEHGR QYRVEYAKNA MIRLAQ---- -----  
----- SYLVEARWTL QN-YKP---S FEEFKANALP TCGYAMLAIT SFVGMGDI--  
-VTPETFKWA AND---PKII QASTIICRFM DDVTEHKFKH -RR-EDDCSA IECYMEEYGV  
-TAQEAYDVF NKHVESAWKD VNQGFLKP-- -TEMPT--EV LNRSNLARV MDVLY--REG  
-DG-YTYVGK -AAKGGITSL LIEPIAL--- -----\*  
>P1;QK\_GOSAR

Length = 775

-----  
MASQVSQMPS SSPLSSNKDE MRPKADFQPS IWGDLFLNCP DKNIDAET-- ----EKRHQQ  
LKEEVRKMIV APMANSTQ-- -----K LAFIDSVQRL GVSYHFTKEI EDELENIYH-  
----- NNDAENDLY TTSLRFLLR EHGfNV--SC DV--FN-KFK DEQGNFKSSV  
TS----- ---DVRGLLE LYQASYLRVH GE--DILDEA ISFTTNHLSL AV-----  
ASLDYPLSEE VSHAL-KQSI RRGLPRVEAR HYLS-VYQDI ESHNKV---- -----LLE  
FAKIDFNMVQ LLHRKELSEI SRWWKDLDF- QRKL-PYARD RVVEGYFWIS G-VYFEPQYS  
LGRKMLTKVI AMASIVDDTY DSYATYEELI PYTKAIERWD --IK-CIDEL P-EYMKPSYK  
ALLDVYEEME QL--VAKHGR QYRVEYAKNA MIRLAQ---- -----  
----- SYLVEARWTL QN-YKP---S FEEFKANALP TCGYAMLAIT SFVGMGDI--  
-VTPETFKWA AND---PKII QASTIICRFM DDVAEHKFKH -RR-EDDCSA IECYMEEYGV  
-TAQEAYDVF NKHVESAWKD VNKEFLKP-- -TEMPT--EV LNRSNLARV MDVLY--REG

```

-DG-YTYVGK -AAKGGITSL LIEPVAL--- -----*
>P1;50_GOSAR
  Length = 775
-----
MASQVSQMPSS SPLSSNKDE IRPKADFQPS IWGDFFLNCP DKNIDAGT-- ----EKRHOQ
LKEEVRKMIV APMANSTQ-- -----K LAFIDSVQRL GVSYHFTKEI EDELENIYH-
----- NNDAENDLY TTSLRFLLR EHGYNV--SC DV--FN-KFK DEQGNFKSSV
TS----- --DVQGLLE LYQASYLRVH GE--DILDEA ISFTTNHLSL AV-----
SSLDHPLSEE VSHAL-KQSI RRGLPRVEAR HYLS-VYQDI ESHNKA---- -----LLE
FAKIDFNMLQ FLHRKELSEI CRWWKDLDF- QRKL-PYARD RVVEGYFWIS G-VYFEPQYS
LGRKMLTKVI AMASIVDDTY DSYATYEELI PYTNAIERWD --IK-CIDEL P-EYMKPSYK
ALLDVYKEME QL--VAEHGR QYRVEYAKNA MIRLAQ---- -----
----- SYLVEARWTL QN-YKP---S FEEFKANALP TCGYAMLAIT SFVGMGDI--
-VTPETFKWA AND---PKII QASTIICRFM DDVAEHKFKH -RR-EDDCSA IECYMEEYGV
-SAQEAYDVF NKHVESAWKD VNQEFOKPK-- -TEMPT--EV LNRSNLARV MDVLY--REG
-DG-YTYVGK -AAKGGITSL LIEPIAL--- -----*

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```

>P1;VE_GOSAR
  Length = 775
-----
MASQVSQMPSS SPLSSNKDE MRPKADFQPS IWGDLFLNCP DKNIDAET-- ----EKRHOQ
LKEEVRKMIV APMANSTQ-- -----K LAFIDSVQRL GVSYHFTKEI EDELENIYH-
----- NNDAENDLY TTSIRFLLR EHGYNV--SC DV--FN-KFK DEQGNFKSSV
TS----- --DVRGLLE LYQASYLRVH GE--DILDEA ISFTTHHLSL AV-----
ASLDHPLSEE VSHAL-KQSI RRGLPRVEAR HYLS-VYQDI ESHNKA---- -----LLE
FAKIDFNMLQ FLHRKELSEI CRWWKDLDF- QRKL-PYARD RVVEGYFWIS G-VYFEPQYS
LGRKMLTKVI AMASIVDDTY DSYATYEELI PYTNAIERWD --IK-CIDEI P-EYMKPSYK
ALLDVYEEMV QL--VAEHGR QYRVEYAKNA MIRLAQ---- -----
----- SYLVEAKWTL QN-YKP---S FEEFKANALP TCGYAMLAIT SFVGMGDI--
-VTPETFKWA ASD---PKII QASTIICRFM DDVAEHKFKH -RR-EDDCSA IECYMEEYGV
-TAQEAYDVF NKHVESAWKD LNQEFLKP-- -TEMPT--EV LNRSNLARV MDVLY--REG
-DG-YTYVGK -AAKGGITSL LIEPIAL--- -----*

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>P1;MY_GOSAR
  Length = 775
-----M
TSQVSQMPSS SPLSSNKDE MRPKADYPPS IWGDFFHNC P DKNIDAET-- ----EKRHOQ
LKEEVRKMIV APMANSTQ-- -----K LTFIDSVQRL GVSYHFTKEI EDELENIYHN
----- NNDAENDLY TTSLRFLLR EHGPNV--SC DA--FN-KFK EEQGNFKSSV
TN----- --NVRGLLE LYEASYLRVH GE--DILDEA ISFSANNLSL AV-----
ASLDYPLSEQ VSHAL-KQSI RRGLPRVEAR HYLS-VYQDI ESHNKA---- -----LLE

```



FAKIDFNMLQ LLHRKELSEI FRWRNDLDF- QTKL-PYTKD RVVECYFWIL G-VYFEPHYS  
LGRKMMTKVI IMTPVIDDTY DSYATYDELN PYTSAIE-WE --IK-CIDQL P-EYMKLSYK  
ALLDVYEEMK QL--LAEHGR QYRVEYAKNA MIRLAQ-----  
----- SYFVEAKWTL QN-YKP---S FEEFKINALS STGYAMLAIT SFVGMARDI--  
-VTPETFKWA ASE---PKII QASAIICRFM DDIAEHKFKH -RR-EDDWSV IDYYMKEYNV  
-TAHDTYDVF NKYIESAWKD MNQELLKP-- -TEMPT--EV MNRSLNLSRV MDVVY--KEG  
-DG-YTYVRK -AMKDVITSL LIEPVTL--- ----- \*

>P1;4N\_GOSHI

Length = 775

-----  
MAQVSQLLS SSPLTSNKDE MRLKADFQPS IWGDLFLTCL DNDIDAET-- ----EQRHQO  
LEGGVRKMIV APMANSTQ-- -----K LTFIDSVQRL GVSYRFTKEI EDELENIYH-  
----- NNND AENDLY TTSLRFLLR EHG FNV--SC EV--FN-KFK DEQGD FKS SL  
TS----- ---DVRGLLE LYEASYLRVH GE--DILDEA ISFTTDHLTL AV-----  
ATLEYPLSEH VSHAL-KKSI RRGLPRIEAR HYLS-VYQDI ESHNTA---- -----LLE  
FAKIDFNMLQ LLHRKELSEI CRWWKDLDF- KRKL-PYVRD RVVECFWIL G-VYFEPQYS  
LGRKILTKVI AMTSVIDDTY DSYATYDELI PYTNAIERWD --IK-CIDQL P-EYMKLSYK  
ALLDVYEEME QL--MAEDGR QYRVEYAKNI MIQLAQ-----  
----- AFLMEAKWTL QN-HKP---S FEEFKATALQ TTGYAMLAIT ALVDMGDI--  
-VTPETFTWA ANN---PKII QASTIICRFM DDVAEHKFKQ -RR-EDDFSG IECYMEEYGV  
-MVQEAYNVF YKHIESAWKD VNKGF LKP-- -TEMPI--EV LNRILNLARV MNVLY--NEG  
-DG-YTYVGK -ATKGIISIL LIEPVTL--- ----- \*

>P1;8W\_GOSAR

Length = 775

-----  
-MASQASQVL ASPHPAISSE NRPKADFHPG IWGDMFIICP DTDIDAAT-- ----ELQYEE  
LKAQVRKMIM EPVDDSNQ-- -----K LPFIDAVQRL GVSYHFEKEI EDELENIYRD  
T----- NNNDADTDLY TTALRFLLR EHGFDI--SC DA--FN-KFK DEAGNFKASL  
TS----- ---DVQGLLE LYEASYMRVH GE--DILDEA ISFTTAQLTL AL-----  
PTLHHPLSEQ VGHAL-KQSI RRGLPRVEAR NFIS-IYQDL ESHNKS---- -----LLQ  
FAKIDFNLLQ LLHRKELSEI CRWWKDLDF- TRKL-PFARD RVVEGYFWIM G-VYFEPQYS  
LGRKMLTKVI AMASIVDDTY DSYATYDELI PYTNAIERWD --IK-CMNQL P-NYMKISYK  
ALLNVYEEME QL--LANQGR QYRVEYAKKA MIRLVQ-----  
----- AYLLEAKWTH QN-YKP---T FEEFRDNALP TSGYAMLAIT AFVGMGEV--  
-ITPETFKWA ASD---PKII KASTIICRFM DDIAEHKFNH -RR-EDDCSA IECYMKQYGV  
-TAQEAYNEF NKHIESSWKD VNEEFLKP-- -TEMPT--PV LCRSLNLARV MDVLY--REG  
-DG-YTHVGK -AAKGITSL LIDPIQI--- ----- \*

>P1;BN\_ARTAN

Length = 775

```

-----
----- --MSVKEEKV IRPIVHFPPS VWADQFLIFD DKQAEQANV- ----EQVVNE
LREDVRKDLV SSDLVQTEHT -----NL LKLIDAIQRL GIAYHFEEEI EQALQHIY--
----- DTYGDDWKGR SPSLWFRILR QOGFYV--SC DI--FK-NYK KEDGSILRNP
LTN----- ---DVEGLLE LYEATYLRVQ GE--GVLDDA LVFTRTCLEK IAKDL-----
VHTNPTLSTY IQEAL-KQPL QKRLARLEAL HYIP-MYEQQ ASHNES---- -----LLK
LAKLGFNLLQ SLHRKELNEV SRWWKGLDV- PNNL-PYARD RMVECYFWAL G-VYFEPKYS
QARIFLAKVI SLATVLDDTY DAYGTYEELK IFTEAIQRWS --IT-CIDML P-EYLKLLYQ
GVLDIYIEME EI--MGKEGK AHHLSYAKES MKEFIR---- -----
----- SYMMEAKWAN EG-YVP---T AEEHMSVAFV SSGYSMLATT CFVGMGDI--
-VTDEAFKWA LTK---PPII KASCAIARLM DDIHSQKEEK -ER-IHVASS VESYMKQYDV
-TEEHVLKVF NKKIEDAWKD ITRESLVR-- -KDIPM--PL MMRVINLAQV MDVLY--KHK
-DG-FTNVGE -ELKDHIKSL LVHPIPI--- -----*

```

>P1;CP\_ARTAN

Length = 775

```

-----
----- --MSVKEEKV IRPIVHFPPS VWADQFLIFD DKQAEQAN-- ---VEQVVNE
LREDVRKDLV SSDLVQTEHT N-----L LKLIDAIQRL GIAYHFEEEI EQALQHIY--
----- DTYGDDWKGR SPSLWFRILR QOGFYV--SC DI--FK-NYK KEDGSFKESL
TN----- ---DVEGLLE LYEATYLRVQ GE--GVLDDA LVFTRTCLEK IAKD-----L
VHTNPTLSTY IQEAL-KQPL HKRLTRLEAL RYIP-MYEQQ ASHNES---- -----LLK
LAKLGFNLLQ SLHRKELSEV SRWWKGLDV- PNNL-PYARD RMVECYFWAL G-VYFEPKYS
QARIFLAKVI SLATVLDDTY DAYGTYEELK IFTEAIQRWS --IT-CIDML P-EYLKLLYQ
GVLDIYIEME EI--MGKEGK AHHLSYAKES MKEFIR---- -----
----- SYMMEAKWAN EG-YVP---T AEEHMSVAFV SSGYSMLATT CFVGMGDI--
-VTDEAFKWA LTK---PPII KASCAIARLM DDIHSQKEEK -ER-IHVASS VESYMKQYDV
-TEEHVLKVF NKKIEDAWKD ITRESLVR-- -KDIPM--PL MMRVINLAQV MDVLY--KHK
-DG-FTNVGE -ELKDHIKSL LVHPIPI--- -----*

```

>P1;UK\_ARTAN

Length = 775

```

-----
----- --MSLIVEDV IRPNANFPSE IWGDQFLAYD QDEQEGV--- ----EQVIKD
LKEEVKSELL TALNSPTQHT -----EL LKFIDAIERL GIAYYFEEEI NOVFOHMY--
----- TAYGDKWTGG NTSLWFRLMR QHGFFV--SS DI--FS-TYK DKEGRFKESL
EK----- ---DVHGLLE LYEAAYMFVP GE--GILDDA LVFTRTCLDE IAKNP-----
SLSNSAVSSQ IREAL-TQPL HKRLPRLEAL RYIP-FYQQQ ASHSET---- -----LLK
LAKLGFNQLQ SLHKKELSII SKWWKSFDV- ANNL-PYARN RPVECYFWAL A-VYFEPQYS
ESRVFLSRFF SIQTFLDDTY DAYGTYEELE QFTEAIQRWS --IT-CLDGL P-ESMKLIFQ
MLVKIFEEIE EI--LSKDGK QHHVNYIKET LKEAVQ---- -----

```

----- SYMTEARWAK EE-YIP---T IEEHTKVSYI SIGYKLALVA GFACMGDV--  
-IADDSFEWV FTN---PPLV NACCLLCRTM DDLGSHKGEQ -DR-KHVA ST IECYMKQFDA  
-SEQQAYESL NKKVEDAWKE INREFMIT-- -CKDVN-IHV AMRVLNFSRS VDVLY--KNK  
-DH-FTHVGV -EVINHISL FVDAIIT--- -----\*  
>P1;TR\_9ASTR

Length = 775

-----  
----- ---MSVQEEV IRPTANFPLS VWGDMFVNYE QQYEDGVD-- ----NKMIDD  
LKEEVRKDIL ATLDHPTEHF -----KL LKLVD AIQRL GIAYYFEE EI NEGLQHIY--  
----- DAYGDHWTGV GTSLWFRLMR QQRFLV--SS DI--LS-KYK DKEGGFNESL  
KN----- ---DVQELLE LYEAAYLGMP GE--VILDDA LRFTRNRLHD IAK-----  
ESNC----TQ IQEAL-KOPL LKRLPRLEAL RYIP-FYESQ PSYNHS---- -----LLK  
LAKLGFNQLQ SLHMKELTQI SNWWKAFDV- PKNL-PYARN RLVESYFWAL G-VYFEPQYS  
QSRMFLARVP ATATLCDDTY DAYGTYEELL VFTEA IERWP --SA-CLEEL P-ENIKLIYR  
MIMNLYEEME KM--LTKMGK SHHLNYVQEA MQEYIR---- -----  
----- SCMREAKWTH ED-YIP---T VEEHIELTYI SSGYKYSLAA SFAAMGHV--  
-ITDETYKWA FTN---PPLV KACCVLCRIM DDI VTHKEEQ -ER-KHVASG IECYMKQFHV  
-TEQH VYDLF NEKVEDAWEE MNKESLIC-- -KDVEM--PV VMRVINLARA MDVLY--KNK  
-DH-YTHVGE -ELINHINSL VVDAIII--- -----\*  
>P1;S4\_ARTAN

Length = 775

-----  
----- --MSLTEEKP IRPIANFPPS IWGDQFLIYE KQVEQGV--- ----EQIVND  
LKKEVRQLLK EALDIPMKHA -----NL LKLIDEIQRL GIPYHFEREI DHALQCIYET  
YGDNW----- -----NGD RSSLWFRLMR KQGY YV--TC DV--FN-NYK DKN GAFKQSL  
AN----- ---DVEGLLE LYEATSMRVP GE--IILED A LGFTRSRLSI MTKDA-----  
FSTNPALFTE IQRAL-KOPL WKRLPRIEAA QYIP-FYQQQ DSHNKT---- -----LLK  
LAKLEFNLLQ SLHKEELSHV CKWWKAFDI- KKNA-PCLRD RIVECYFWGL G-SGYEPQYS  
RARVFFTKAV AVITLIDDTY DAYGTYEELK IFTEAVERWS --IT-CLDTL P-EYMKPIYK  
LFMDTYTEME EF--LAKEGR TDLFNCGKEF VKEFVR---- -----  
----- NLMFEAKWAN EG-HIP---T TEEHDPV VII TGGANLLTTT CYLGMSDI--  
-FTKESVEWA VSA---PPLF RYSGILGRRL NDLMTHKAEQ -ER-KHSSSS LESYMKEYNV  
-NEEYAQTLI YKEVEDVWKD INREYLTT-- -KNIPR--PL LMAVIYLCQF LEVQY--AGK  
-DN-FTRMGD -EYKHLIKSL LVYPMSI--- -----\*  
>P1;96\_ARTAN

Length = 775

-----  
----- --MSLTEEKP IRPIANFPPS IWGDQFLIYE KQVEQGV-- ----QIVND  
LKKEVRQLLK EALDIPMKHA N-----L LKLIDEIQRL GIPYHFEREI DHALQCIY--

----- ETYGDNWNNGD RSSLWFRLMR KQGYV--TC DV--FN-NYK DKNGAFKQSL  
AN----- ---DVEGLLE LYEATSMRVP GE--IILED A LGFTRSRLSI MTKD-----A  
FSTNPALFTE IQRAL-KOPL WKRLPRIEAA QYIP-FYQQO DSHNKT---- -----LLK  
LAKLEFNLLQ SLHKEELSHV CKWWKAFDI- KKNA-PCLRD RIVECYFWGL G-SGYEPQYS  
RARVFFTKAV AVITLIDDTY DAYGTYEELK IFTEAVERWS --IT-CLDTL P-EYMKPIYK  
LFMDTYTEME EF--LAKEGR TDLFNCGKEF VKEFVR---- -----  
----- NLMVEAKWAN EG-HIP---T TEEHDPVVI TGGANLLTTT CYLGMSDI--  
-FTKESVEWA VSA---PPLF RYSGILGRRL NDLMTHKAEQ -ER-KHSSSS LESYMKEYNV  
-NEEYAQTLI YKEVEDVWKD INREYLTT-- -KNIPR--PL LMAVIYLCQF LEVQY--AGK  
-DN-FTRMGD -EYKHLIKSL LVYPMSI--- -----\*  
>P1;3W\_9ASTR

Length = 775

----- MAAKQGEVVR PDADYSYHPS LWGDQFLHYD EQEDDQVE-- -V--DQQIEI  
LKEETRREIL SSLDDPAKHT -----NL LKLIDVIQRL GIAYYFEHEI TQALDHIYNV  
YG----- ---DEWNGG STSLWFRLLR QOGFYV--SC DI--FN-IYK LDNGSFKDSL  
TK----- ---DIECMLE LYEAAYMRVQ GE--IILDEA LEFTKTHLEQ IAKD-----P  
LRCNNTLSRH IYEAL-KRPI RKRLPRVDAL QYMP-FYEQQ DSHNKS---- -----LLR  
LAKLGFNRLQ SLHKKELSOL SKWWKEFDA- PKNL-RYVRD RLVELYFWVL G-VYFEPQYS  
RSRIFLTKVI KMATILDDTY DIHGTYEELE IFTKAVQRWS --IT-CMDTL P-DYMKMIYK  
SLLDVYEEME EI--IEKDGK AYQVHYAKDS MIDLVT---- -----  
----- SYMTEAKWLH EG-HVP---T FEEYNSITNL TGGYKMLTTS SFVDMPGD--  
IVTQESFRWA LNN---PPLI KASADVSRIM DDIVGHKEEQ -QR-KHLPSR VEMYMKKYHL  
-AEEDVYDLL QORVEDAWKD LNRETLTC-- -KDIHM--AL KMRPINLARV IDMLY--KND  
-DN-LKNVGQ -EIQDYIKSC FINAISV--- -----\*  
>P1;HS\_9ASTR

Length = 775

----- MAAKQGEVVR PDADYSYHPS LWGDQFLHYD EQEDDQVEV- ----DQQIEI  
LKEETRKEIL SSLDDPAKHT N-----L LKLIDVIQRL GIAYYFEHEI TQALGHIY--  
----- NVYGDEWNGG STSLWFRLLR QOGFYV--SC DI--FN-IYK LDNGSFKDSL  
TK----- ---DIECMLE LYEAAYMRVQ GE--IILDEA LEFTKTHLEQ IAKDP-----  
LRCNNTLSRH IYEAL-KRPI RKRLPRVDAL QYMP-FYEQQ DSHNKS---- -----LLR  
LAKLGFNRLQ SLHKKELSOL SKWWKEFDA- PKNL-RYVRD RLVELYFWVL G-VYFEPQYS  
RSRIFLTKVI KMATILDDTY DIHGTYEELE IFTKAVQRWS --IT-CMDTL P-DYMKMIYK  
SLLDVYEEME EI--IDKDGK AYQVHYAKDS MIDLVT---- -----  
----- SYMTEAKWLH EG-HVP---T FEEYNSITNL TGGYKMLTTS SFVDMPGD--  
IVTQESFKWA LNN---PPLI KASADVSRIM DDIVGHKEEQ -QR-KHLPSR VEMYMKKYHL  
-AEEDVYDLL QORVEDAWKD LNRETLTC-- -KDIHM--AL KMRPINLARV IDMLY--KND

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-DN-LKNVGQ -EIQDIKSC FINAISV--- -----*
>P1;8P_9ASTR
  Length = 775
-----
----- --MAAKQVEV IRPVANYHPS LWGDQFLHYD EQEDEHVEV- ----DQQIEI
LKEETRKEIL ASLDDPTKHT N-----L LKLIDVIQRL GIAYYFEHEI TQALDHIY--
----- SVYGDEWNGG RTSLWFRLLR QOGFYV--SC DI--FN-IYK LDNGSFKDSL
TK----- ---DIECMLE LYEAAYMRVQ GE--IILDEA LEFTKTHLEH IAKDP-----
LRCNNTLSRH IHEAL-ERP V QKRLPRLDAI RYIP-FYEQQ DSHNKS---- -----LLR
LAKLGFNRLQ SLHKKELSQL SKWWKEFDA- PKNL-PYVRD RLVELYFWIL G-VYFEPQYS
RSRIFLTKTI KMAAILDDTY DIYGTYEELE IFTKAVQRWS --IT-CMDTL P-DYMKVIYK
SLLDVYEEME EI--IEKD GK AYQVHYAKES MIDLVT---- -----
----- SYMTEAKWLH EG-HVP---T FDEHNSVTNI TGGYKMLTAS SFVGMHGD--
IVTQESFKWV LNN---PPLI KASSDISRIM NDI VGHKEEQ -QR-KHIASS VEMYMKEYNL
-AEEDVYDFL KERVEDAWKD INRETLTC-- -KDIHM--AL KMPPINLARV MDMLY--KNG
-DN-LKNVGQ -EIQDYMKSC FINPMSV--- -----*

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>P1;4E_9ASTR
  Length = 775
-----
----- MAAKHVEAIR PAANYQYHPS LWGDQFLHYD EREDEHVEV- ----DQQIEI
LKEETRKEIL ASLDDPAKHT N-----L LKLIDVIQRL GIAYYFEHEI TQALDHIY--
----- NVYGDEWNGG STSLWFRLLR QOGFYV--SC DI--FN-IYK LDNGSFKDSL
TK----- ---DIECMLE LYEAAYMRVQ GE--IILDEA LEFTKTHLEQ IAKDP-----
LRCNNTLSRH IHEAL-ELPV QKRLPRLDAI RYIP-FYEQQ DSHNKS---- -----LLR
LAKLGFNRLQ SLHKKELSQL SKWWKEFDA- PKNV-PYARD RLVEHYFWIL G-VYFEPQYS
RSRIFLAKII TMTAILNDTY DIYGTYEELE IFTKALQTWS ---T-CMDTF P-DYMKVIYK
SLLDIYEEME EI--MEKNGK AYQVDYAKEA MRELLTG--- -----
----- GYMAEAKLLH EG-HVP---T FEEHNKITNL SAGHKMLSTS SFVGMMPGD--
IVTQDSFKWA LNN---PRLI TASAYIGRIL NDI VGHKEEQ -QR-KHIPSI VEMYMKEHNL
-LREDVYDLL KQVEDAWKD LNRETLTC-- -KDIHMS--L KMCPINLARV EHKIY--KNG
-DN-LKFVGO -EIQDIKSC FINAMSV--- -----*

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```

>P1;KI_9ASTR
  Length = 775
-----
----- MAAKHVEAIR PAANYQYHPS LWGDQFLHYD EREDEHVE-- -V--DQQIEI
LKEETRKEIL ASLDDPAKHT -----NL LKLIDVIQRL GIAYYFEHEI TQALDHIYNV
YG----- ---DEWNGG STSLWFRLLR QOGFYV--SC DI--FN-IYK LDNGSFKDSL
TK----- ---DIECMLE LYEAAYMRVQ GE--IILDEA LEFTKTHLEQ IAKDP-----
LRCNNTLSRH IHEAL-ELPV QKRLPRLDAI RYIP-FYEQQ DSHNKS---- -----LLR

```

LAKLGFNRLO SLHKKELNQL SKWWKEFDA- PKNV-PYARD RLVEHYFWIL G-VYFEPQYS  
RSRIFLAKII TMTAILNDTY DIYGTYYEELE IFTKALQ TWS ---T-CMDTF P-DYMKVIYK  
SLLDIYEEME EI--MEKNGK AYQVDYAKEA MRELLT---- -----  
-----G GYMAEAKLLH EG-HVP---T FEEHNKITNL SAGHKMLSTS SFVGM PGD--  
IVTQDSFKWA LNN---PRLI TASAYIGRIL NDI VGHKEEQ -QR-KHIPSI VEMYMKEHNL  
-LREDVYDLL KQRVEDAWKD LNRETLTC-- -KDIHM--SL KMCPINLARV EHKIY--KNG  
-DN-LKFVGO -EIQDYIKSC FINAMSV--- -----\*  
>P1;TF\_ARTAN

Length = 775

----- MSTLPISSVS  
FSSSTSPLVV DDKVSTKPDV IRHTMNFNAS IWGDQFLTYD EPEDLVMK-- ----KQLVEE  
LKEEVKKELI TIKGSNEPMQ HVK-----L IELIDAVQRL GIAYHFEEEI EEALQIHVT  
YG----- EQWVDKENLQ SISLWFRLLR QQGFNV--SS GV--FK-DFM DEKGGFKESL  
CN----- ---DAQGILA LYEA AFMRVE DE--TILDNA LEFTKVHLDI IAKD-----  
PSCDSSLRTO IHQAL-KOPL RRRLARIEAL HYMP-IYQQE TSHNED---- -----LLK  
LAKLDFSVLQ SMHKKELSHI CKWWKDLDL- QNKL-PYVRD RVVEGYFWIL S-IYYEPQHA  
RTRMFLMKT C MWLVVLD DDTF DNYGTYYEELE IFTQ AVERWS --IS-CLDML P-EYMKLIYQ  
ELVNLHVEME ES--LGKGGK NISNSLCQGR WOKELG---- -----  
-----SQ ITLVETKMAK RG-VHAQ--P LEEYMSVSMV TGT YGLMIAR SYVGRGDI--  
-VTEDTFKWV SSY---PPII KASCVIVRLM DDI VSHKEEQ -ER-GHVASS IECYSKESGA  
-SEEEACEYI SRKVEDAWKV INRESLRP-- -TAVPF--PL LMPAINLARM CEVLY--SVN  
-DG-FTHAEG -DMKSYMKS FVHPMVV--- -----\*  
>P1;5D\_ARTAN

Length = 775

----- MSTLPISSVS  
FSSSTSPLVV DDKVSTKPDV IRHTMNFNAS IWGDQFLTYD EPEDLVMK-- ----KQFVEE  
LKEEVKKELI TIKGSNEPMQ H-----VKL IELIDAVQRL GIAYHFEEEI EEALQIHVT  
YG----- EQWVDKENLQ SISLWFRLLR QQGFNV--SS GV--FK-DFM DEKGGFKESL  
CN----- ---DAQGILA LYEA AFMRVE DE--TILDNA LEFTKVHLDI IAKD-----  
PSCDSSLRTO IHQAL-KOPL RRRLARIEAL HYMP-IYQQE TSHNEV---- -----LLK  
LAKLDFSVLQ SMHKKELSHI CKWWKDLDL- QNKL-PYVRD RVVEGYFWIL S-IYYEPQHA  
RTRMFLMKT C MWLVVLD DDTF DNYGTYYEELE IFTQ AVERWS --IS-CLDML P-EYIKLIYQ  
ELVNLHVEME ES--LGKGGK NISNSLCQGR WOKELGSQ-- -----  
----- ITLVETKMAK RG-VHAQ--P LEEYMSVSMV TGT YGLMIAR SYVGRGDI--  
-VTEDTFKWV SSY---PPII KASCVIVRLM DDI VSHKEEQ -ER-GHVASS IECYSKESGA  
-SEEEACEYI SRKVEDAWKV INRESLRP-- -TAVPF--PL LMPAINLARM CEVLY--SVN  
-DG-FTHAEG -DMKSYMKS FVHPMVV--- -----\*  
>P1;II\_ARTAN

Length = 775

```

----- MSTLPISSVS
FSSSTSPLVV DDKVSTKPDV IRHTMNFNAS IWGDQFLTYD EPEDLVMK-- ----KOLVEE
LKEEVKKELI TIKGSNEPMQ HVK-----L IELIDAVQRL GIAYHFEEEI EEALQHIHVT
YG----- EQWVDKENLQ SISLWFRLLR QOGFNV--SS GV--FK-DFM DEKGKFKESL
CN----- --DAQGILA LYEA AFMRVE DE--TILDNA LEFTKVHLDI IAKD-----
PSCDSSLRTO IHQAL-KQPL RRLARIEAL HYMP-IYQOE TSHDEV---- -----LLK
LAKLDFSVLQ SMHKKELSHI CKWWKDLDL- QNKL-PYVRD RVVEGYFWIL S-IYYEPQHA
RTRMFLMKT C MWLVVLDLDTF DNYGTYYEELE IFTQAVRWS --IS-CLDML P-EYMKLIYQ
ELVNLHVEME ES--LEKEGK TYQIHVYKEM AKELVR---- -----
----- NYLVEARWLK EG-YMP---T LEEYMSVSMV TGTYGLMIAR SYVGRGDI--
-VTEDTFKWV SSY---PPII KASCIVIRLM DDIVSHKEEQ -ER-GHVASS IECYSKESGA
-SEEEACEYI SRKVEDAWKV INRESLRP-- -TAVPF--PL LMPAINLARM CEVLY--SVN
-DG-FTHAEG -DMKSYMKS FVHPMVV--- -----*

```

>P1;1V\_ARTAN

Length = 775

```

-----MSTFLV CNASFSPSYG
LPSSCDRNS- ----SMNQEI VRNTVKFPPS IWGDQFLTYH EPKSLTI-- ----EKQHVE
EVEEIRKLL NTAFSEPKQH -----TKL IHLIDSVQRL GVSYHFQEI EEALQHVYAT
HG----- DQWIGKDNLK STSQWFRILR QOGFNV--SS GI--FE-NHM DDKGKFKEHL
SD----- --DVOGMLG LYEAAYMSVE GE--KELDDA LEFTKTHLGN IAKD-----
PSQNASLRTK IEQAL-NRPL RKRMPRLEAL HYIP-KYQOE ASHDET---- -----LLN
LAKLDYNMLQ SIHKREISEI CKWWKDLDF- SNKL-PHVRD RLVEIYFWVL G-VYFEPQHY
RSRMFLT KTS MWLVVLDLDTY DNYGTYYEELK IFTEAVQRWS --LS-CLDSL P-EYMKLIYR
ELINHYQEME ES--VEKEGK SYQLFYAKEM VKENCR---- -----
----- NLLVEAKWLK EG-YVP---T LEEHMSVSCV TYAYAVMIAN SYVGRENM--
-VTEESFKWV AKF---PPLV NATCLILRLM DDIAGHEEQ -ER-DHVSS IECYRNETGA
-SEEDAVKFL SKQVEDAWKV INKECLRP-- -TEIPM--SL TIPPLSLARV SDILY--KTN
-NG-YNHAGE -EVISYIKSL LVHPLV---- -----*

```

>P1;CA\_SOLLC

Length = 775

```

-----
-----MAASSADK CRPLANFHPS VWGYHFLSYT HEITNOEK-- ----VEVDE
YKETIRKMLV ETCDNSTQ-- -----K LVLIDAMQRL GVAYHFDNEI ETSIQNIFDA
SS----- QONDNDNNLY VVSLRFLVR QOGHYM--SS DV--FK-QFT NQDGKFKETL
TN----- --DVOGLLS LYEASHLRVR NE--EILEEA LTFTTTHLES IVSN-----L
SNNNNSLKVE VGEAL-TQPI RMTLPRMGAR KYIS-IYENN DAHHHL---- -----LLK
FAKLDFNMLQ KFHQRELSL TRWWKDLDF- ANKY-PYARD RLVECYFWIL G-VYFEPKYS
RARKMMTKVL NLTSIIDDTF DAYATFDELV TFNDAIQRWD --AN-AIDSI Q-PYMRPAYQ

```

ALLDIYSEME QV--LSKEGK LDRVYYAKNE MKKLVR-----  
----- AYFKETQWLN DCDHIP---K YEEQVENAIV SAGYMMISTT CLVGIEEF--  
-ISHETFEWL MNE---SVIV RASALIARAM NDIVGHEDEQ -ER-GHVASL IECYMKDYGA  
-SKQETYIKF LKEVTNAWKD INKQFSRP-- -TEVPM--FV LERVLNLTRV ADTLY--KEK  
-DT-YSTAKG -KLKNMINPI LIESVKI--- ----- \*

>P1;ED\_SOLLC

Length = 775

-----  
-----LV PNSARASADK CRPLANFHPS VWGYHFLSYT HEITNQE--- ----KVEVDE  
YKETIRKMLV ETCDNSTQ-- -----K LVLIDAMQRL GVAYHFDNEI ETSIQNIFDA  
SS----- KQNDNDNNLY VVSLRFRLVR QOGHYM--SS DV--FK-QFT NQDGKFKETL  
TN----- ---DVQGLLS LYEASHLRVR NE--EILEEA LTFTTTHLES IVSNL-----  
SNNNNSLKVE VGEAL-TQPI RMTLPRMGAR KYIS-IYENN DAHHHL---- -----LLK  
FAKLDFNMLQ KFHQRELSDL TRWWKDLDF- ANKY-PYARD RLVECYFWIL G-VYFEPKYS  
RARKMMTKVL NLTSIIDDTF DAYATFDELV TFNDAIQRWD --AN-AIDSI Q-PYMRPAYQ  
ALLDIYSEME QV--LSKEGK LDRVYYAKNE MKKLVR-----  
----- AYFKETQWLN DCDHIP---K YEEQVENAIV SAGYMMISTT CLVGIEEF--  
-ISHETFEWL MNE---SVIV RASALIARAM NDIVGHEDEQ -ER-GHVASL IECYMKDYGA  
-SKQETYIKF LKEVTNAWKD INKQFFRP-- -TEVPM--FV LERVLNLTRV ADTLY--KEK  
-DT-YTNAKG -KLKNMINSI LIESVKI--- ----- \*

>P1;FD\_SOLLC

Length = 775

-----  
----- --MAASSADK CRPLANFHPS VWGYHFLSYT HEITNQE-- ----VEVDE  
YKETIRKMLV ETCDNSTQ-- -----K LVLIDAMQRL GVAYHFDNEI ETSIQNIFDA  
SS----- KQNDNDNNLY VVSLRFRLVR QOGHYM--SS DV--FK-QFT NQDGKFKETL  
TN----- ---DVQGLLS LYEASHLRVR NE--EILEEA LTFTTTHLES IVSN-----L  
SNNNNSLKVE VGEAL-TQPI RMTLPRMGAR KYIS-IYENN DAHHHL---- -----LLK  
FAKLDFNMLQ KFHQRELSDL TRWWKDLDF- ANKY-PYARD RLVECYFWIL G-VYFEPKYS  
RARKMMTKVL NLTSIIDDTF DAYATFDELV TFNDAIQRWD --AN-AIDSI Q-PYMRPAYQ  
ALLDIYSEME QV--LSKEGK LDRVYYAKNE MKKLVR-----  
----- AYFKETQWLN DCDHIP---K YEEQVENAIV SAGYMMISTT CLVGIEEF--  
-ISHETFEWL MNE---SVIV RASALIARAM NDIVGHEDEQ -ER-GHVASL IECYMKDYGA  
-SKQETYIKF LKEVTNAWKD INKQFFRP-- -TEVPM--FV LERVLNLTRV ADTLY--KEK  
-DT-YTNAKG -KLKNMINSI LIESVKI--- ----- \*

>P1;MM\_SOLHA

Length = 775

-----  
----- --MAASSANK SRPLANFHPT VWGYHFLSYT HEITNQE-- ----VEVDE



YKETIRKMLV EAPEGSEQ-- -----K LVLIDAMQRL GVAYHFHNEI ETSIQNIF--  
----- DAPKQNNNLH IVSLRFRLVR QOGHYM--SS DV--FK-QFT NQDGKFKETL  
TN----- ---DVOGLLS LYEASYLRVR DE--EILEEA LAFTTTHLKS IVST-----M  
SNNNNSLKVE VSEAL-TQPI RMTLPRMEAR RYIS-IYENN DAHNHL-----LLK  
FAKLDFNMLQ KLHQRELSDL TRWWKDLDF- ANKY-PYARD RLVECYFWIL G-VYFEPKYS  
RARKMMTKVL KMTSIIDDTF DAYATFDELE PFNDAIQRWD --AN-AIDSI P-PYMRPAYQ  
AFLDIYSEME QV--LSKKGK LDRVYYAKNE MKKLVR-----  
----- AYFKETQWLN DCDHIP---K YEEHMENSLV SGGYMMIPTT CLVGMEEF--  
-ISIETFEWL MND---PLIV RASSLIARAM NDIVGHEVEQ -ER-GHVASL IECYMKDYGA  
-SKQEAYAKF KKDVNTAWKD INKEFFRP-- -TEVPM--FV LERVLNLTRA AEPLY--KEK  
-DA-YTNAKG -KLKNMINSI LIESVKI--- -----\*  
>P1;L5\_SOLHA

Length = 775

-----  
----- --MAASFANK CRPLANFHPT VWGYHFLYYN PEITNQE--- ----KIEVDE  
YKETIRKMLV EAPEGSEQ-- -----K LVLIDAMQRL GVAYHFHNEI ETSIQNIFDA  
----- PKQNNDDNLH IVSLRFRLVR QOGHYM--SS DV--FK-QFT NQDGKFKETL  
TN----- ---DVOGLLS LYEASHLRVR NE--EILEEA LTFTTTHLES IVSNL-----  
SNKNNSLKVE VSEAL-SQPI RMTLPRIGAR KYIS-IYENN DAHNHL-----LLK  
FAKLDFNMLQ KFHQRELSDL TRWWKDLDF- ANKI-PYARD RLVECYFWIL G-VYFEPKYS  
RARKMMTKVL KMTSIIDDTF DAYANFDELV PFNDAIQRWD --AN-AIDSI P-PYMRPIYQ  
ALLDIYGEMD QV--LSKEGK LDRVYYAKYE MKKLVR-----  
----- AYFKESQWLN DDNHIP---K YEEHMENAIV TVGYMMGATN CLVGMEEF--  
-ISKETFEWL MSE---PVIV RASSLIGRAM DDIVGHEVEQ -ER-GHVASI IECYMKDYGA  
-SKQEAYAKF KKDVNTAWKD INKEFFRP-- -TEVPM--FV LERALNFTRV IDTLY--QEE  
-DE-YTNAKG -KLKNMIHSI LIESVKI--- -----\*  
>P1;08\_TOBAC

Length = 775

-----MS QSISPIFPRF AKFQSNIWRC STFELRVIHS SYASIGGRRK  
ERERRMKRA- ----MNPSSS SRHLADFHST IWGDHFLSYN SEITEITT-- -QE-KNEHEM  
LKEIVRKMLV ETPDNSTQ-- -----K LVLIDTIQRL GLAYHFNDEI ENSIQNIFNL  
SQN----- SENDNEHNLY VAALRFRLAR QOGYYM--SS DV--FK-QFT NHDGKFKENH  
IN----- ---DIQGLLS LYEATHMRVH DE--EILEEA LIFTTTHLES MI-----  
PNLSNSLKVQ VTEAS-NQPI RKTIPRVGSR KYIY-IYENI GTHNDL-----LVK  
FAKLDFNMLQ ELHRKELNEL TSWWKEMDF- ATNF-QYAKG RLVEAYFWMV G-IYFEPQYS  
RSRRMITQVV NMNSIIDDTY DAFATFDELM LFTDAIQRWD --VG-AMDSL P-AYLRPIYQ  
GLLDVFNEME EV--MAKEGK ADRIYYAKNE MKKLVA-----  
----- AYFKEVWLN AN-YIP---K CEEYMKNGVV SCTGRCMEQF ALVVIEEI--  
-ITKEAFEWL ANE---PLIP RAASTICRLM DDIVDHEVEQ -QR-GHVASF VEYYMKEYGT

-SKQEAYVEM WKKITNAWKD INKELLRA-- -TAVPM--FV LERTLDYTRL VDTCF--KDD  
-DG-YTNPKS -KVKDMIALL FVESIDI--- -----\*  
>P1;H1\_TOBAC

Length = 775

-----MSQISPL ICSHFAKFQS N----- -IWRCNTSQL RVIHSSYASF  
GGRRKERVRR MNRAMDLSSS SRHLADFPST IWGDHFLSYN SEITEITT-- -QE-KNEHEM  
LKEIVRKMLV ETPDNSTQ-- -----K LVLIDTIQRL GLAYHFNDEI ENSIQNIFNL  
SQN----- SEDDDEHNLV VAALRFRLAR QQGYM--SS DV--FK-QFT NHDGKFKENH  
TN----- -DVQGLLS LYEAAMRVH DE--EILEEA LIFTTTHLES VI-----  
PNLSNSLKVQ VTEAL-SHPI RKAI PRVGAR KYIH-IYENI GTHNDL---- -----LLK  
FAKLDFNMLQ KLHRKELNEL TSWWKDLDR- ANKF-PYAKD RLVEAYFWTV G-IYFEPQYS  
RSRSLVTKV KMNSIIDDTY DAYATFDELV LFTDAIQRWD --EG-AMDLL P-TYLRPIYQ  
GLLDVFNEME EV--LAKEGK ADHIYAKKE MKKVAE---- -----  
----- VYFKEAEWLN AN-YIP---K CEEYMKNGLV SSTGPMYGI SLVVMEEI--  
-ITKEAFEWL TNE---PLIL RAASTICRLM DDMADHEVEQ -QR-GHVASF VECYMKEYGV  
-SKQETYVEM RKKITNAWKD INKELLRP-- -TAVPM--FI LERSLNFSRL ADTFL--KDD  
-DG-YTNPKS -KVKDLIASL FVESVDI--- -----\*  
>P1;EG\_9SOLA

Length = 775

-----MDAEI TRRSNHHPT VWGDHFLAYI HLLGANEW-- -E--EKEHGD  
LKEEVRKMLL MTSSKSLQ-- -----M LDLINKIQLL GVAYHFEHEI EESLSYIYTR  
YEEW----- INEVDNSDLH AVSLSFRLLR RQGYCV--SC DA--FR-KYI EGQGDYNKAL  
VS----- -NVHGLLS LYEAAQLRVE GE--EILDEA VNFTITHLKL LL-----  
PKLSNSLAIQ VHNAL-KYPI NKTIVRVASR KYIS-FYQED DSHNEV---- -----LLN  
FAKLDFNMLQ KLHKRELCDI TRWWKELDF- AQTL-HFARD RVVELYFWSL G-VYFEPQYR  
VARNILTKML CFISITDDIY DTYGTLDEL TLLTNAIERWN --IN-ASEQL P-SYMKLFYL  
ALLNFYNEAE KE--LLKENK SFRVNYSIVE MKKLVR---- -----  
----- AYFQEAQWYN GD-NIP---T MEQYVKNQIV SSTYLLLVT T SSLGLGKE--  
-ATKEAFDWI ATE---PPIA VAASIIGRLS NDIVSHEREL -KR-GDVASA IECYMNDYGV  
-TKEEAYTKM RKI IENKWKV VNRGCLKP-- -LAVAR--VL PMAMLNLSRV AEFFY--KDE  
-DA-YTVSKN -NLRDIISMV LVDPITIQ-- -----\*  
>P1;3A\_OCIBA

Length = 775

-----TSPKNSDVEE IRKSATYHSS VWGNHFLSYT SDVTEITA-- -AE-KEQLEK  
LKEKVNLLA QTPDESTG-- -----K MELIDAIQRL GVGYHFTTEI QESLRQIH--  
EG----- QIRNDDDDVR VVALRFRLLR QGGYRA--PC DV--FE-KFM DDGGNFKESL  
KK----- -DVEGMLS LYEASYYGID GE--EIMDKA LEFSSSHLES MLHNI----S

TKTNKSLRR LQEAL-DTPI SKAAIRLGAT KFIS-TYRED ESHNED---- -----ILN  
FAKLDFNIIQ KMHQEEANYL TRWWEDLDL- ASKL-DFARD RMVESYFWSL G-VYFQPQYR  
TSRIYLTKII SIVAVIDDIY DVYGSFDDL R SFTDVIQSWK --IS-NADEL P-PYMRICFE  
ALLGIYEDMG -----D RIGAPYAIDT MKELVD---- -----  
----- TYMQEAEWCY TE-YVP---T VDEYMKVALV TGGYLMVATT FLTGINN---  
-ITKKDFDWI RNR---PRLI QVAEVLTRLM DDIAGHGTEK -KT-----TA VSCYMKEYEC  
-SEMEASREL SKQVKKAWKD LNDEWMEP-- -RSSA--EI IGCIVNMSRV LHIMY--STG  
-DD-GFSDSS TRTTQAVKTL LVDHPMN--- -----\*  
>P1;DE\_OCIBA

Length = 775

-----  
MTNMFASAAP ISTNNTTVED MRRSVTYHPS VWKDHFLDYA SGITEVE--- ----MEQLQK  
QKERIKTLLA QTLDDFVL-- -----K IELIDAIQRL GVGYHFEKEI NHSLRQIYDT  
F----- QISSKDNDIR VVALRFLLR QHGYPV--PS DV--FK-KFI DNQGRLDSEV  
MN----- --NVEGMLS LYEASNYGME GE--DILDKA LEISTSHLEP LAS-----  
RS-----RR INEAL-EMPI SKTLVRLGAR KFIS-IYEED ESRDED---- -----LLK  
FAKLDFNIIQ KIHQEELTHI ARWWKELDL- GNKL-PFARD RVVECYFWIL G-VYFEPQYN  
IARRFMTKVI AMTSIIDDIY DVHGTLEELQ RFTDAIRSWD --IR-AIDEL P-PYMRICYE  
ALLGMYAEME NE--MVKQOQ SYRIEYARQE MIKLV-----  
----- TYMEEAKWCY SK-YIP---N MDEYMKLALV SGAYMMLATT SLVGILGD--  
PITKQDFDWI TNE---PPIL RAASVICRLM DDVVGHGIEQ -KI-----SS VDCYMKENGC  
-SKMEAVGEF SKRVKKAWKN LNEEWVEP-- -RAASM--VI LVRVVNLARV INLLY--VGE  
-DS-YGNSSV -KTKELIKGV LVHPIK----- -----\*  
>P1;M4\_CUCSA

Length = 775

-----  
--MSSHFPAS IMKTNDIYDT KRSLANFHPT IWKEHFLSFT FDDALKVD-- -GGMKERIEK  
LKEEIRMMVI ASVQNPLV-- -----K LNLVDSIQRL GVSYHFEDEI DQFLEHMYVS  
YNNLLFS-- SNDSQDDDLH ISALLFLLR QHGYSRI--SC DI--FL-KFM DNNGKFESL  
VE----- --DERGILS LYEASHMRGH GE--ALLEEA LEFTTTHLKA YIHLY-----  
SNINPNFASE VSNAL-KLPI RKCVPVKAR EYFE-IYQQQ PSHNET---- -----LLT  
FSKLDFNIIQ KLHQKEIAEI CRWWKDLNV- STNF-PFARD RIVECYFWIL S-IYFEPYFK  
FGRKILTKVI AMTSIMDDIY DAYGTFEELQ LFTLAIKRD --MS-MVNLL P-QYMKVHYT  
TLLDLFEEMD KG--IVNDGI SYRSCFGKEA MKRQAE----- -----  
----- SYFKEAEWLN KN-YKP---K YGEYMEVALA SSGYELLSTI SFVCMGDI--  
-ATKEVFEWL FDC---PQIL KASTTISRML DDVVSYKFEK -ER-EHIVSA VECYMSNHGR  
-SEDETCAEL LKQVEDAWKT INECCLHP-- -MNVPM--PF LICLLNLTRV MALLY--SHE  
-DG-YTNSKG -RTKLLIQSL LIDPLHL--- -----\*  
>P1;PA\_CUCME

Length = 775

```
-----M
SSQVSNFPAS IMKTNDIPDV KRSLANFHPN IWKEHFLSFT FDDALKID-- -EGMKERTEK
LKEEIRMMMI AYVENQLI-- -----K LNLVDSIQRL GVSYHFEDEV DEFLEHIYVS
YNNLSLLS-- NKNSNGEDLH ITALLFRLLR QOQYRI--SC DI--FL-KFM DDNGKFKESL
VE----- --DERGLLS LYEASHMMGH GE--ALLEEA LEFTTTHLQT YIHR-----Y
SNINPSFASE VSNAL-KLPI RKSVPRIKAR EYLE-IYQQH PSHNET---- -----LLE
FSKLDNFNIQ KLHQKELSEI CRWWKDLDV- PTKF-PFARD RIVECYFWTL G-AYFEPQYS
VGRKMLTKVI AIASILDDIY DAYGTFEELQ VLTPAIQRWD --RS-MVHTL P-LYMKPFYV
AMLELYEEIG KE--IDKDQN SLHLQVAIGG IKRLSE---- -----
----- SYFEEAKWLN KE-YKP---S FKEYMELALK TTGYTMLISI SFLGLGDH--
IVTNEVLQWL SNG---PQII KASTIICRLM DDIASHKFEQ -ER-EHVASA VECYMKQYDC
-SEEEACIEL HKEVVDWKD TNEAFYRP-- -FNVPV--PV LMRVLNFSRV INLLY--LDE
-DG-YTNAKS -GTKFLIKSL LVDPLPC--- -----*
```

>P1;W4\_9APIA

Length = 775

```
-----
-MDVMNATFG APPPHKKTET VRPTVQYHPS VWGDHFLSYP THGHLTAG-D -SDKVEEIKL
LKEEVKQMLF KAGDNPOQ-- -----Q LVLIDDIQRL GVAYHFVSEI DEALKCMSES
YQQLS----- EKMIEDQDFH MTALLFRLLR QOQHNV--SA DE--FL-KFK DNNGAFQECL
MK----- --DVRGILS LYEATHLRVH GE--DILEEA LAFTTSQIEL L-----
EFSDNMLANE AKRAL-KRPI RKDLNRVIAQ HYIS-IYEKI DSHNKV---- -----LMK
LAKLDFNYLQ KLHQGELSYI CSWWRGLNA- KEKF-PFARD RIVEDYFRIL G-VYFEPQYL
LARRILTKCI AMNSILDDIY DAYGTLDLLE IFTDAIQRWD --IN-AMDQL P-EYMKHYYQ
ALLDFCEIE KY--MVETGR PLFRVQHAKD KYQLAR--- -----
----- AYLQEAQWSN KS-YVP---T MEEYITNALI TTGYTFLGTC SFVGMGDV--
-ATREAFDWV TND---PLMI RAASVVCRIC DDIVGHEMEQ -ER-QHVASA IECYMKQYGA
-SKDETVAEF KKWVANAWKD LNKECLNP-- -TTMAM--PL CTRIFNMTCV IHCLY--QQK
-DA-YTFSNN -STKEMITSV LVDPVPI--- -----*
```

>P1;2T\_VITVI

Length = 775

```
-----
MSVQSSGVLL APSKNLSPEV GRRCANFHPS IWGDHFLSYA SEFTNTDD-- --HLKQHVQO
LKEEVRKMLM AADDDSAQ-- -----K LLLIDAIQRL GVAYHFSEI DEVLKHMFDG
----- SVVSAEEDVY TASLRFRLLR QOQYHV--SC DL--FN-NFK DNEGNFKESL
SS----- --DVRGMLS LYEATHFRVH GE--DILDEA LAFTTTHLQS AT-----
KHSSNPLAEQ VVHAL-KQPI RKGLPRLEAR HYFS-VYQAD DSHNKA---- -----LLK
LAKLDFNLLQ KLHQKELSDI SAWWKDLDF- AHKL-PFARD RVVECYFWIL G-VYFEPQFF
FARRILTKVI AMTSIIDDIY DVYGTLEELE LFTEAVERWD --IS-AIDQL P-EYMRVCYQ
```

ALLYVYSEIE EE--MAKEGR SYRLYYAKEA MKNQVR-----  
----- AYYEEAKWLQ VQ-QIP---T MEEYMPVALV TSAYSMLATT SFVGMGDA--  
-VTKESFDWI FSK---PKIV RASAIVCRLM DDMVFHKFEQ -KR-GHVASA VECYMKQHGA  
-SEQETPNEF POPVREAWKD INEECLIP-- -TAVPM--PI LMRVLNLARV IDVIY--KNE  
-DG-YTHFGA -VLKDFVTSM LIDPVPI--- ----- \*

>P1;GA\_VITVI

Length = 775

-----  
MSVQSSVLL APSKNLSPEV GRRCANFHPS IWGDHFLSYA SEFTNTDD-- -HL-KQHVQQ  
LKEEVRKMLM AADDDSAQ-- -----K LLLIDAIQRL GVAYHFESI DEVLKHMFDG  
----- SVVSAEEDVY TASLRFLLR QOGYHV--SC DL--FN-NFK DNEGNFKESL  
SS----- ---DVRGMLS LYEATHFRVH GE--DILDEA LAFTTTHLQS AT-----  
KYSSNPLAEQ VVHAL-KQPI RKGLPRLEAR HYFS-VYQAD DSHNKA---- -----LLK  
LAKLDFNLLQ KLHQKELSDI SAWWKDLDF- AHKL-PFARD RVVECYFWIL G-VYFEPQFF  
FARRILTKVI AMTSIIDDIY DVYGTLEELE LFTEAVERWD --IS-AIDQL P-EYMRVCYQ  
ALLYVYSEIE EE--MAKEGR SYRLYYAKEA MKNQVR-----  
----- AYYEEAKWLQ VQ-QIP---T MEEYMPVALV TSAYSMLATT SFVGMGDA--  
-VTKESFDWI FSK---PKIV RASAIVCRLM DDMVSHKFEQ -KR-GHVASA VECYMKQHGA  
-SEQETHNEF NKQVRDAWKD INEECLIP-- -TAVPM--PI LMRVLNLARV IDVIY--KNE  
-DG-YTHSGT -VLKDFVTSM LIDPVPI--- ----- \*

>P1;Z0\_VITVI

Length = 775

-----  
MSSLLASVDL PPKKDTTTEV VRDSANYHPS IWGNHFLENA SHDVHIID-- -GHTEQQVQQ  
LKEEVRKMII SSTDNYSQ-- -----K YNLIDTIQRL GVSYHFESI EEALKHLSDY  
YHV----- SCEEDDDDL C TVALRFLLR QHGYNII--SY DA--FK-KFK DNKGNFKESL  
IS----- ---DVKGMLS LYEATHLRKH GE--DILDEA LTFTTTHLQS M-----  
PYFSSPLAEQ VVHAL-RQPL HKGIQRLEAR HHIS-IYQED DAHSEA---- -----LLK  
LAKLDFNQLQ KVHQQELSVI VSWWKDLDF- AKKL-PFARD RVVECYFWAL T-VYFEPQYF  
HARRILTKVI ALTSILDDIY DLFGTLEELE IFTEAIERWD --IS-FIGQL P-DYMKVFYQ  
ALLDVYNEIE EV--TVKAGR SYRAHYAKEA MKNQVR-----  
----- AYFAEAKWLF LR-QMP---T IEEYMSVALP TSGYQLLATT SFIGMENM--  
-VTKDTFEWV FSD---PKIV RASSTICRLM NDMVPHKFEQ -KR-GHVPSA VECYMKQHGV  
-SEQQTLDEL HNQVRDAWKD MNQECLSP-- -TAVPM--PI IMRVLNLARF IDVVY--KDE  
-DG-YTHSET -VLKDLIASL LIHPVPI--- ----- \*

>P1;NF\_POPJC

Length = 775

-----  
--MSVEGSAI FSTATVEPNV SRRSAGYSPS IWGDHFLSYA TDSMETS D-- ----KAEHKK

LKEEVKRELM ANINKPSQ-- -----T LDFIDAIQRL GISYHFEIEI DEILREMYKS  
HCDFDNGD-- DDDHHHNDLY AISLKFRLLR QOGYKI--SC DV--FG-KFK NSQGTFNDSL  
AN----- ---DTRGILS LYEATHLRVH GD--EVLEEA LVFTTSHLEF LA-----  
THSSSPLRAK INHAL-KQPV RKNIPRLEAR HYFS-IYQED PSCSEV---- -----LLN  
FAKLDFNLIQ KQHOKELSEI ANWWKELDF- AKKL-PFARD RVIECYFWIL G-VYLEPEYF  
LARRILTKVI AMTSVIDDIY DVYGTPEELE LFTDAIERWE --IT-AVDQL P-EYMKVTYK  
ALLDVYTEIE EN--MVTEER SYRVYAKEA MKNLVR---- -----  
----- AYYLESKWFH QK-HTP---T MEEYMAVALV TSGYAMLAT SFVGMGHV--  
-VTKDSFDWL FRG---PKIL KASEIICRLM DDIVSHKFEQ -KR-GHVASS IECYMKQHGT  
-TEQETVHEF RKQVTDWKD LNEEFLHP-- -TAVPM--PL LTRMLNLARV IDVVY--KDE  
-DG-YTNAGT -VLKDLVSAL LIDPVP--- -----\*  
>P1;AJ\_ACTDE

Length = 775

-----MQLPC  
AQALPIPTVT TTTSIEPPHV TRRSANYHPS IWGDHFLAYS SDAMEEEVIN -MEQQORLHH  
LKQKVRKMLE AAAEQSSQ-- -----M LNLVDKIQRL GVSYHFETEI ETALRHIYK-  
----- TCDYHFDDLH TAALSFRLLR QOGYPV--SC DM--FD-KFK NSKGEFQESI  
IS----- ---DVOGMLS LYEATCLRILH GE--DILDEA LAFTITQLRS AL-----  
PNLSTPFKEQ I IHAL-NQPI HKGLTRLNAR SHIL-FFEON DCHSKD---- -----LLN  
FAKLDFNLLQ KLHQRELCEI TRWWKDLNF- AKTL-PFARD RMVECYFWIL G-VYFEPQYL  
LARRMLTKVI AMISIIDDIY DVYGTLEELV LFTDAIERWE --IS-ALDQL P-EYMKLCYQ  
ALLDVYSMID EE--MAKQGR SYCVDYAKSS MKILVR---- -----  
----- AYFEEAKWFH QG-YVP---T MEEYMQVALV TAGYKMLATS SFVGMGDL--  
-ATKEAFDWV SND---PLIV QAASVIGRLK DDIVGHKFEQ -KR-GHVASA VECYSKQHGT  
-TEEEAIIEL DKQVTHSWKD INAECLCP-- -IKVPM--PL LARVLNLARV LYVIY--QDE  
-DG-YTHPGT -KVENFVTSV LIDSMPIN-- -----\*  
>P1;5G\_MEDTR

Length = 775

-----MEYSQ  
TKSLAACAQV DSTQHAVSDF KRPIANFRPC IWGHLFLKYD SESMEIDD-- -NM-MQQVQM  
QKEEVKLLLL SSRNDMAQ-- -----I LNLIDSLQRL GISYQFEHEI DEALEQIHNN  
FSDNK----- EMTSEEGDLH FLALVFRLLR QKGHHM--SS DI--FE-KFK NPKGNFNEKI  
SK----- ---DIQGMWR LYEAHLMIH GE--DILDEA LDFTYSKLNT LET-----  
NQVSPFLATQ VRHCL-KTPL YKRVRVEIR CYIS-SYGEE SSQSKV---- -----LLN  
FAKLDYNMLQ KMHQKEIGSI TKWWKKSDF- VTKV-PYARD RVVEAYFWPL A-MSYVPKDS  
IARKIVAKLI SVISLVDDTY DAYGTVEELE LFTQAIQRWD --IS-LIQSL P-ECMQVVFN  
TIVEFYDEME RT--IVEIGK SSLVLPYIKQ DIFYKVAR--- -----  
----- AYLVEAKWCK AG-YIP---T YDEYKVNGLA STSIPNLILT FLVFGEL---  
-SNEELVNW I LNY---PTII DAVSIFGRLT DDISTNKFEH -ER-VHVASA VDCCMKQYDI

-SQEEAYKLI LKEIEDLWRV MNEECLKL-- -HHIPR--PV LECILNFARG THFIY--EDF  
-EDKYT-NPD -LLKDYIAAL LVDPISIEQC E-----\*  
-----\*

>P1;Z0\_MEDTR

Length = 775

-----  
-----ME SLAAPAPVDI KRPIVDFSPS IWGDVFLQYD SQPMEIND-- -NM-KTQVQM  
QKEEVRKIFQ SSSNDISQ-- -----K LNFIDSLQRL GISYHFEREI DEALEQIHK  
LTKNK----- EITTKEGSLH FLALEFRLLR KKGYHI--SS DEI-FE-KFK NNKGLNENI  
SK----- ---DVQGMWS LYEAAQLRIH DE--DILDEA LDFTYSHLNS LIT-----  
NELSPFLAKQ LCQCL-RTPL HKGVPRLETR CYIS-SYGEE PSHSKV---- -----LLN  
FAKLDFTVQ KMHQNEIGSI TKWKDSEF- ATNV-PYARD RVAEAYFWPL A-MSYEPKYS  
TARKMVGKLV TCVSLDDTY DAYGTVEELE LFTEAMQRWD --IN-VIQL P-ESMKVVFN  
SIVELCDEIE TT--IVENGT SSLVFIQYVK QNFYKLAR-- -----  
----- SYFVESKWC S EG-YIP---T YDEYKANGSI SSSYP-LQIL SFIGLGEF--  
-SNDEILDWI FNY---PTII DAISAHGRLA DDISSHKFEQ -ER-VHVASA VECCMKQYDM  
-SGEEAYNFI RKEIENYWKV MNEECLKL-- -DNIPR--PV LEFIMNVARV TEFAY--ENF  
-EDKYT-KPE -LLKDYIVAL LVDPISIELS E-----\*  
-----\*

>P1;5C\_CUCME

Length = 775

-----  
-----MSSN ISAIPNSLEV IRRSAQFQAS VWGDYFLSYH SLSPEKGN-- -KVMEKQTEE  
LKEEIKRELN STTKDEEPE- -----K LRLIDSIQRL GVCYHFYEYI NKILEQLHHI  
TIT----- SKNNGDDHPY NMTLRFLLR QOGYNI--SS KS-----FE RFRGWESSY  
DK----- ---NVEELLS LYEASQLRMR GE--EALDEA FRFATAQLEA IVQD-----  
PTDPTVVG VCQAL-KWPM YKNLPRLQAS HYIG-LYSEK PWRNES---- -----LPN  
FAKMDFSKLQ KLHQKEIAYI SKWDDYGF- AEKL-SFARN RIVEGYFFAL G-IFFEPQLS  
TARLIMTKII AIGSVLDDIY DVYGTFEELK LLTLALERWD --KS-ETKKL P-KYMKMYE  
ALLDVFEIE QE--MSQKET TPYCIHQMKE ATKELGR--- -----  
----- VFLVEAKWCK EG-YTP---T VEEYLDIALI SFGHKLLMVT ALLGMGST--  
IATQQIVQWI TSM---PNIL KASAIICRLM NDIVSHKFEQ -ER-GHVASA IECYMEQNYM  
-SEHDVLIIL GKQIDEFWKD MVENYCVVIT EEEVPR--GV LMRVLNLR L FNVIIY--KDG  
-DG-YTQSHG -STKTHIKSL LVDSLPL--- -----\*  
-----\*

>P1;WR\_CUCSA

Length = 775

-----  
-----MSSN VSAIPNSFEL IRRSAQFQAS VWGDYFLSYH SLPPEKGN-- -KVMEKQTEE  
LKEEIKMELV STTKDEPE- -----K LRLIDLQRL GVCYHFENEI NNILQQLHHI  
TIT----- SEKNDDNPY NMTLCFRLLR QOGYNV--SS EP--FD-RFR GKWESSYDN-  
----- ---NVEELLS LYEASQLRMQ GE--EALDEA FCFATAQLEA IVQD-----

PTTDPMVAAE IRQAL-KWPM YKNLPRLKAR HHIG-LYSEK PWRNES---- -----LLN  
FAKMDFNKLO NLHQTEIAYI SKWWDYDGF- AEKL-SFARN RIVEGYFFAL G-IFFEPQLL  
TARLIMTKVI AIGSMLDDIY DVYGTFEELK LLTLALERWD --KS-ETKQL P-NYMKMYE  
ALLDVFEIE QE--MSQKET ETTPYCIHHM KEATKELGR- -----  
----- VFLVEATWCK EG-YTP---K VEEYLDIALI SFGHKLLMVT ALLGMGSH--  
MATQQIVQWI TSM---PNIL KASAVICRLM NDIVSHKFEQ -ER-GHVASA IECYMEQNHL  
-SEYEALIAL RKQIDDLWKD MVENYCAVIT EDEVPR--GV LMRVLNLTRL FNVIY--KDG  
-DG-YTQSHG -STKAHIKSL LVDSVPL--- -----\*

>P1;99\_MEDTR

Length = 775

-----  
-----MS TLTNSNPEIK QRNLADYHPN IWGEYFIQYA SESMDLDQ-- -NI-VAEIDT  
LKSEVRNMLV AKTDEPFA-- -----K VKLVDSICRL GVSYHFEKEI DDVLQQVHKS  
CVEN----- GEVILEDNLC ALAVLFRVLR QOGFYV--SP NV--FT-KFK DKQGNFNETL  
IT----- ---DVEGMLS LYEASHMIVH EE--DILEEA LGFTSTHLES IA-----  
TQLNHSLAEQ VKYAS-KHPI HKNLPRLEAR HYIS-IYEQD PSHNEI---- -----LLT  
FSKLDFNLLQ SLHQKEFGNI CKWWKELDF- SSKL-PYARD RIVECSFWSL I-VYFEPQYP  
QARKMLSKVN AILSFIDDTY DSYGTIDELE LFTEAIERWD --ID-ALNNL P-DYMKLLYK  
SFWNIYEIE QE--MIKQGR LYILNYYEKE FKKAVQ---- -----  
----- AYMTEARWLN KN-YIP---T TEEYMSVSTI SCCSTLLILT SYIGMGDT--

-VIENIFNWL TNE---PIIA NAAATICRVM DEIVSSEFEH -KR-GHVCSL LDCYIKQYGM  
-TREAAIQEC QKRVAIAWKD INKECLRP-- -TEVPI--EF LTRALNFSRF MDVIFY--TDK  
-DN-YTHVEG -LMKTYIKDV LVDPIPI--- -----\*

>P1;XG\_MEDTR

Length = 775

-----  
-----MS TVAYSDDHAK QRNLADYHPS VWGGFFLQYA SETMELDQ-- -NL-ASQIDT  
LKDEVRNMLV SKTEMPLT-- -----K VKLIDSICRL GVGYHFEKEI DEVLQHIHKS  
YVEN----- GEITLEDSLC SLAMLFRVFR QOGLHV--SP NV--FN-KFK DKQGNFNENL  
ST----- ---DVEGMLS LYEASHMMVH ED--DILEEA LNFTSTHLES IA-----  
SQSSPSLAAQ IEYTL-KQAL HKNIPRLEAR HYIS-IYEKD PTCDEV---- -----LLT  
FAKLDFNLLQ SLHQKEFGNI SKWWKELDF- STKL-PYARD RIAECSFWVL T-AFFEPQYS  
QARKMMIKVI TLLSIIDDTY DAYGTIDELE LFTKAVERWD --IS-SLDEL P-DYMKPIYR  
SFLTIEEIE KE--MRKEGR IYTLDYKIE FKKSVQ---- -----  
----- AFMTEARWLN EN-HIP---T TEEYMRISKK SGAYPLLILT SYIGMGDI--  
-ATKEIFNWV SNE---PRIV NAAATLCLRM DEIVSSEFEQ -KR-GHVCSL LDCYMKQFDM  
-SREAAIQEC KNRMTIVWKD INEECLRP-- -TEVPM--PF MTRVLNLSRF MDVIY--KNK  
-DN-YTDSGD -LMKTCIKEY LVDPVPI--- -----\*



>P1;EV\_MEDTR

Length = 775

```
-----
MSVSVTSSLV APTPNANSDF SRRSANYHPN IWGDLFIQYV LEPMEFDE-- -I--MKQIIM
LKEKVRQMLV PNVNVTNPSR -----E ANLIDSIQRL GLYHHFEQEI GELLRHIDNN
HVEN----- GTITLNEDLH SIALVFRLLR QOQYHI--LP DV--FK-KFK NEQGNFKETL
VG----- ---DVEGMLS LYEATHMRIH GE--EILDDA LSFTSLHLEM MT-----
TQLSPSVATK INHSL-KRPL FKNLPRVAR HYIS-TYEED PSHDAT---- -----LLL
LAKLDFNLLQ KQHQKEVGDI SKWWKDLDF- ATKL-PFARN RIVEAYFWIL G-VYFEPQYS
FGRRIMTKVI SLASVIDDIY DVYGTIEELQ LFTQAIERWD --IS-CMDFL P-QYMKFCYK
AVLDVYEEME QE--MVKEGR AFCVFIYAKNE MKRLVQ---- -----
----- AYFTEAKWFS RN-YIP---T VDEYMALGIV NSGYYLITAT SFIGMGCI--
-ATEDVFQWL TNN---PKIV NASSKIARLM DDIVSNEFEQ -ER-GHGASA IECYMNEHGV
-SREDAVNEL SRQVTNAWKD TNEELLD-- -TEVPK--PL LIRVLNLSRV IDVLY--KDG
-DC-YTNSQG -STKNDIISI LLNCPV--- -----*
-----
```

>P1;EM\_9ROSI

Length = 775

```
-----
-MKMSIPLL AAVSSSTEET VRPIADFHPT LWGNHFLKSA ADVETIDA-- -AT-QEQHAA
LKQEVRRMIT TTANKLAQ-- -----K LHMIDAVQRL GVAYHFEKEI EDELGKVS--
----- -HDLDSDDL YVSLRFRLFR QOGVKI--SC DV--FD-KFK DDEGKFESL
IN----- ---DIRGMLS LYEAAYLAIR GE--DILDEA IVFTTTHLKS VISISDH---
SHANSNLAEQ IRHSL-QIPL RKAARLEAR YFLD-IYSRD DLHDET---- -----LLK
FAKLDFNILQ AAHQKEASIM TRWWNDLGF- PKKV-PYARD RIIETIYIWM LGSVYEPNLA
FGRIFASKVV CMITTIDDTF DAYGTFEELT LFTEAVTRWD --IG-LIDTL P-EYMKFIVK
ALLDIYREAE EE--LAKEGR SYGIPYAKQM MQELII---- -----
----- LYFTEAKWLY KG-YVP---T FDEYKSVLR SIGLRTLAVA SFVDLGDF--
IATKDNFECI LKN---AKSL KATETIGRLM DDIAGYKFEQ -KR-GHNPSA VECYKNQHG
-SEEEAVKEL LLEVANSWKD INEELLNP-- -TTVPL--PM LQRLLYFARS GHFIY--DDG
HDR-YTH-SL -MMKROVALL LTEPLAI--- -----*
-----
```

>P1;HV\_9ROSI

Length = 775

```
-----
----MSAQVL ATVSSSTEKT VRPIAGFHPN LWGDYFLTLA SDCKTDDT-- -TH-QEYEA
LKQEVRRMIT ATADTPAQ-- -----K LQLVDAVQRL GVAYHFEQEI EDAMEKIYHD
D----- FDNNDVDVLY TVSLRFRLLR QOGFKV--PC DV--FA-KFK DDEGKFASL
VR----- ---DVHGILS LYEAGHLAIR GE--GILDEA IAFTRTHLQS MVSQ-----
DVCPNNLAEQ INHTL-DCPL RRALPRVETR FFLS-VYPRD DKHDKT---- -----LLK
-----
```

FSKLDFNLVQ RIHQKELSAI TRWWKDLDF- TTKL-PYARD RIVELYFWIV G-TYFEPKYT  
LARKIMTKTI YTASIIDDTF DAYGFFEEKL LFAEAVQRWD --IG-AMDIL P-EYMKVLYK  
ALLDTFNEIE QD--LAKEGR SSCLPYGKEK MQELVQ---- -----  
----- MYFVQAKWFS EG-YVP---T WDEYYPVGLV SCGYFMLATN SFLGMCDV--  
-ANKESFEWI SRT---LRFQ QRHQFICRLR NDIVSHQFEQ -KR-GHIASG VECYIKQYGV  
-SAEEVTVF TEEVENAWKD MNEEFKLP-- -TAFPV--AL IERPFNIARV IEFLN--KKG  
-DW-YTH-SH -AIKDQIAAV LRDPVTI--- -----\*  
>P1;WM\_CITSI

Length = 775

-----  
-----MSSGET FRPTADFHPS LWRNHFLKGA SDFKTVDH-- -TATQERHEA  
LKEEVRRMIT DAEDKPVQ-- -----K LRLIDEVQRL GVAYHFEKEI GDAIQKLCPI  
----- YIDSNRADLH TVSLHFRLLR QOGIKI--SC DV--FE-KFK DDEGRFKSSL  
IN----- --DVQGMLS LYEAAYMAVR GE--HILDEA IAF'T'THLKS LVAQ-----  
DHVTPKLAEQ INHAL-YRPL RKTLPRLR YFMS-MINST SDHLCN---- -----KTLN  
FAKLDFNILL ELHKEELNEL TKWWKDLDF- TTKL-PYARD RLVELYFWDL G-TYFEPQYA  
FGRKIMTQLN YILSIIDDTY DAYGTLEELS LFTEAVQRWN --IE-AVDML P-EYMKLIYR  
TLLDAFNEIE ED--MAKQGR SHCVRYAKEE NQKVIG---- -----  
----- AYSVQAKWFS EG-YVP---T IEEYMPIALT SCAYTFVITN SFLGMGDF--  
-ATKEVFEWI SNN---PKVV KAASVICRLM DDMQGHEFEQ -KR-GHVASA IECYTKQHG  
-SKEEAIKMF EEEVANAWKD INEELMMK-- -PTVVA-RPL LGTILNLARA IDFIY--KED  
-DG-YTH-SY -LIKDQIASV LGDHVVPF--- -----\*  
>P1;BK\_MAIZE

Length = 775

-----  
---MASPPAH RSSKAADEEL PKASSTFHPS LWGSFFLTYQ PPTAPQRAN- ---MKERAEV  
LRERVRKVLK GSTTDQLP-- -----ET VNLILTLQRL GLGYYYENEI DKLLHQIYS-  
----- NSDYNVKDLN LVSQRFYLLR KNGYDV--PS DV--FL-SFK TEEGGFACAA  
A----- --DTRSLLS LYNAAYLWKH GE--EVLDEA ISSTRRLQD LLGR-----  
LLPESFAKE VSSSL-RTPL FRRVGILEAR NYIP-IYETE ATRNEA---- -----VLE  
LAKLNFNLQO LDFCEELKHC SAWWNEMIA- KSKL-TFVRD RIVEEYFWMN G-ACYDPPYS  
LSRIILTKIT GLITIIDDMF DTHGTTEDCM KFAEAFGRWD --ES-AIHLL P-EYMKDFYI  
LMLETFQSF D---ALGPEK SYRVLYLKQA MERLVE---- -----  
----- LYTKEIKWRD ED-YVA---T MSEHLQVSAE SIGANALTCS AYAGMGDM--  
SITKETFEWA LSF---PQFI RTFGSFVRLS NDVVSTKREQ -TK-DHSPST VHCYMKEHGI  
-TMDACEKI KELIEDSWKD MLEQSLAL-- -KGLPK--VV PQLVDFDFSR TDNMY--RDR  
-DA-LTSSEA --LKEMIQLL FVEPIPE--- -----\*  
>P1;S3\_MAIZE

Length = 775

```

----- MASPPA HRSS-----
----- KAADEEL PKVSSTFHPS LWGSFFLTYQ PPTAPQRA-- -NM-KERAEV
LRERVRKVLK GSTTDQLPE- -----T VNLILTLQRL GLGYYYENEI DKLLHQIYS-
----- NSDYNVKDLN LVSQRFYLLR KNGYDV--PS DV--FL-SFK TEEGGFACAA
A----- DTRSLLS LYNAAYLWKH GE--EVLDEA ISSTRRLRLQD LLGR-----
LLPESPFAKE VSSSL-RTPL FRRVGILEAR NYIP-IYETE ATRNEA---- -----VLE
LAKLNFNLQO LDFCEELKHC SAWWNEMIA- KSKL-TFVRD RIVEEYFWMN G-ACYDPPYS
LSRIILTKIT GLITIIDDMF DTHGTTEDCM KFAEAFGRWD --ES-AIHLL P-EYMKDFYI
LMLETFQSFE D---ALGPEK SYRVLYLKQA MERLVE---- -----
----- LYTKEIKWRD ED-YVA---T MSEHLKVS AE SIGANALTCS AYAGMGDM--
SITKETFEWA LSF---PQFI RTFGSFVRLS NDVESTKREQ -TK-DHSPST VHCYMKEHGI
-TMDDACEKI KELIEDSWKD MLEQSLAL-- -KGLPK--VV PQLVFDFSRT TDNMY--RDR
-DA-LTSSEA --LKEMIQLL FVEPIPE--- -----
-----*
```

>P1;NN\_MAIZE

Length = 775

```

----- MASPPAH RSSKAADEEL PKASSTFHPS LWGSFFLTYQ PPTAPQORAN- ---MKERAEV
LRERVRKVLK GSTTDQLP-- -----ET VNLILTLQRL GLGYYYENEI DKLLHQIYS-
----- NSDYNVKDLN LVSQRFYLLR KNGYDV--PS DV--FL-SFK TEEGGFACAA
A----- DTRSLLS LYNAAYLRKH GE--EVLDEA ISSTRRLRLQD LLGR-----
LLPESPFAKE VSSSL-RTPL FRRVGILEAR NYIP-IYETE ATRNEA---- -----VLE
LAKLNFNLQO LDFCEELKHC SAWWNEMIA- KSKL-TFVRD RIVEEYFWMN G-ACYDPPYS
LSRIILTKIT GLITIIDDMF DTHGTTEDCM KFAEAFGRWD --ES-AIHLL P-EYMKDFYI
LMLETFQSFE D---ALGPEK SYRVLYLKQA MERLVE---- -----
----- LYSKEIKWRD DD-YVP---T MSEHLQVSAE TIATIALTCS AYAGMGDM--
SIRKETFEWA LSF---PQFI RTFGSFVRLS NDVVSTKREQ -TK-DHSPST VHCYMKEHGT
-TMDDACEKI KELIEDSWKD MLEQSLAL-- -KGLPK--VV PQLVFDFSRT TDNMY--RDR
-DA-LTSSEA --LKEMIQLL FVEPIPE--- -----
-----*
```

>P1;5G\_MAIZE

Length = 775

```

----- MASPPAH RSSKAADEEL PKASSTFHPS LWGSFFLTYQ PPTAPQORAN- ---MKERAEV
LRERVRKVLK GSTTDQLP-- -----ET VNLILTLQRL GLGYYYENEI DKLLHQIYS-
----- NSDYNEKDLN LVSQRFYLLR KNGYDV--PS DV--FL-NFK TEEGGFACAA
A----- DTRSLLS LYNAAYLRKH GE--EVLDEA ISSTRRLRLQD LLGR-----
LLPESPFAKE VSSSL-RTPL FRRVGILEAR NYIP-IYEKE ATRNEA---- -----VLE
LAKLNFNLQO LDFCEELKHC SAWWNEMIA- KSKL-TFVRD RIVEEYFWMN G-ACCDPPYS
LSRIILTKIT GLITIIDDMF DTHGTTEDCM KFAEAFGRWD --ES-AIHLL P-EYMKDFYI
```

LMLETFSQFE D---ALGPEK SYRVLYLKQA MERLVE-----  
----- LYSKEIKWRD QD-YVA---T MSEHLQVSAE SIGANALTCS AYAGMGDM--  
SITKETFEWA LSF---PQFI RTFGSFVRLS NDDVSTKREQ -TK-DHSPST VHCYMKEHGT  
-TMDDACEKI KELIEDSWKD MLEQSLAL-- -KGLPK--VV PQLVDFDFSR TDNMY--RDR  
-DA-LTSSEA --LKEMIQLL FVEPIPE--- ----- \*

>P1;2I\_MAIZE

Length = 775

-----  
--MAAPTLTA DGPRLGQQEM KKMSPSFHPT LWGDFFLSYE APTEAQEAQ- ---MREKAAV  
LKEEVRNMIK GSHDVPE--- -----I VDLIITLQRL NLDYHYEDEI NEKLTVVY--  
----- KSNYDGGNLD LVSRRFYLLR KCGYDV--SS DV--FL-KFK DQLGNFVEA-  
----- --DTRSLLS LYNA AFLRIH GE--TVLDEA ISFTMRVLQD RL-----  
EHLESPLAEE VSSAL-DAPL FRRVGTLEMK DYIP-IYEKD AKQNK-----ILE  
FAKLNFNLLQ LRYSSSELKEC TTWWKELRV- ESNL-SFVRD RIVEVYFWMS G-GCYDPQYS  
HSRIILTKIV AFITILDDTL DSHATSCEM QLAEAIERWD --ES-AVSL P-EYMKDFYM  
YLLKTFSSFE N---ELGPK SYRVFYLKEA VKELVR-----  
----- EYTKEIKWRD ED-YVP--KT LKEHLKVSLI SIGGTLVLCS AFVGMGDV--  
-VTKKIMKWV MSD---AELV KSGFIFVRLS NDI VSTKREQ -RE-KHCVST VQCYMKQHEI  
-TMDEACEQI KELTEDSWKF MIEQGLAL-- -KEYPI--IV PRTVLEFART VDYMY--KEA  
-DK-YTVSHT --IKDMLTSL YVKPVL M----- \*

>P1;5I\_MAIZE

Length = 775

-----MAA  
PTLTADGPR- ----LGQQEM KKMSPSFHPT LWGDFFLSYE APTEAQEA-- -QM-REKAAV  
LKEEVRNMIK GSHDVPE--- -----I VDLIITLQRL NLDYHYEDEI NEKLTVVY--  
----- KSNYDGGNLD LVSRRFYLLR KCGYDV--SS DV--FL-KFK DQLGNFVEA-  
----- --DTRSLLS LYNA AFLRIH GE--TVLDEA ISFTMRVLQD RL-----  
EHLESPLAEE VSSAL-DTPL FRRVGTLEMK DYIP-IYEKD AKQNK-----ILE  
FAKLNFNLLQ LRYSSSELKEC TTWWKELRV- ESNL-SFVRD RIVEVYFWMS G-GCYDPQYS  
HSRIILTKIV AFITILDDTL DSHATSCEM QLAEAIERWD --ES-AVSL P-EYMKDFYM  
YLLKTFSSFE N---ELGPK SYRVFYLKEA VKELVR-----  
----- EYTKEIKWRD ED-YVP--KT LKEHLKVSLI SIGGTLVLCS AFVGMGDV--  
-VTKKIMKWV MSD---AELV KSGFIFVRLS NDI VSTKREQ -RE-KHCVST VQCYMKQHEI  
-TMDEACEQI KELTEDSWKF MIEQGLAL-- -KEYPI--IV PRTVLEFART VDYMY--KEA  
-DK-YTVSHT --IKDMLTSL YVKPVL M----- \*

>P1;WZ\_MAIZE

Length = 775

-----  
--MAAPTLTT DGPRLGQQEM KKMSPSFHPT LWGDFFLSYE APTEAQEA-- --EMRQRAEV

```

LREEVRNMIK GSHDVPE--- -----I VDLIITLQRL NLDYHYEDEI NEKLAVVY--
----- NSNYDGGNLD LVSRRFYLLR KCGYHV--SS DV--FL-NFK DOYGNFIEV-
----- ---DTRSLLS LYNAAYLRH GE--TVLDEA ISFTTRCLQD RL-----
EHLESPIAEE VSSAL-DTPL FRRVGTLEMK DYIP-IYEKD AKQNK-----ILE
FAKLNFNLLQ LLYSSELKEC TTWWKELRV- ESNL-SFVRD RIVEVYFWS G-GCYDPQYS
HSRIILTKIV AFITILDDTL DSHANSYEM QLAEVERWD --ES-AVSL P-EYMKDFYM
YLLKTFSSFE N---ELGPKD SYRVFYLKEA VKELVR-----
----- EYTKEIKWRD ED-YVP--KT LKEHLKVSLI SIGGTLVLC AFVGMGDV--
-VTKKIMEWV MSD---AELV KSGFIFVRLS NDIVSTKREQ -RE-KHCVST VQCYMKQHEL
-TMDEACEQI KELTEDSWKF MIEOGLAL-- -KEYPI--IV PRTVLEFART VDYMY--KEA
-DK-YTVSHT --IKDMLTSL YVKPVL--- -----*

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>P1;Y4\_ORYSJ

Length = 775

```

-----
-----MSSTP AANFSNEDDE RKAPTGFHPS LWGDFFISYQ PPTAPKHAY- ---MKERAEV
LKEEVRKVVK GSNEVPE--- -----I LDLVITLQRL GLDSYYKAEI DELLCTVY--
----- NTDYNDKDLH LVSLRFYLLR KNGYDV--SS DI--FQ-HFK DKEGSFVAD-
----- ---DTRSLLS LYNAAYMRTH GE--KVLDEA VVFTTNRLRS ELK-----
-HLKSPVADE VSLAL-DTPL FRRVRIETQ NYIP-IYESA TTRNEA-----ILE
FAKLNFNLLQ LIYCEELKTI TRWWKELNV- ESNL-SFIRD RIVEMHFWMT G-ACSEPHYS
LLRIILTKMT AFITILDDIF DTYATTEESM MLAKAIYMCN --ES-ATVLL P-KYMKDFYL
YYLKTFSFE E---ALGPNK SYRVLYFKEL FKILIK-----
----- GYSEEIKWRD DH-YIP--KT IEEHLELSRM TVGAFQLACA SLVGMGDF--
-ITEDTLDYL LTY---PKLI KSYTTCVRLS NDIASKREQ -AG-DHYAST IQCYMLQHGT
-TIHEACIGI KELIEDSWKD MMKEYLAP-- -TNLQP-KIV ARTVIDFART GDYIY--KQA
-DS-FTFSHT --IKDMIASL YVEPYSI--- -----*

```

>P1;KH\_ORYSI

Length = 775

```

-----
-----MSSTP AANFSNEDDE RKAPTGFHPS LWGDFFISYQ PPTAPKHA-- -YM-KERAEV
LKEEVRKVVK GSNEVPE--- -----I LDLVITLQRL GLDSYYKAEI DELLCTVY--
----- NTDYNDKDLH LVSLRFYLLR KNGYDV--SS DI--FQ-HFK DKEGSFVVD-
----- ---DTRSLLS LYNAAYMRTH GE--TVLDEA VVFTSNRLRS EL-----
KHLKSPVADE VSLAL-DTPL FRRVRIETR NYIP-IYESA TTRNEA-----ILE
FAKLNFNLLQ LIYCEELKTI TRWWKELNV- ESNL-SFIRD RIVEMHFWMT G-ACSEPHYS
LSRIILTKMT AFITILDDIF DTYGTTEESM MLAKAIYMCN --ES-ATLLL P-KYMMDFYL
YYLKTFSFE E---ALGPNK SYRVLYFKEL FKILIK-----
----- GYSEEIKWRD DH-YIP--KT IEEHLELSRT TVGAFQLACA SLVGMGDF--
-ITEDTLDYL LTY---PKLL KSYTTCVRLS NDIASKREQ -AG-DHYAST IQCYMLQHGT

```

-TIHEACIGI KELIEDSWKD MMKEYLTP-- -TDLQP-KIV ARTVIDFART GDYMY--KQA  
-DS-FTFSHT --IKDMIASL YVEPYSI--- -----\*  
>P1;XU\_MAIZE

Length = 775

-----  
----- -MDATAFHPS LWGDFVVKYK PPTAPKRG-- --HMTERAEL  
LKEEVRKTLK AAANQITN-- -----A LDLIITLQRL GLDHHYENEI SELLRFVYS-  
----- SSDYDDKDLY VVSLRFYLLR KHGHCV--SS DV--FT-SFK DEEGNFVVD-  
----- ---DTKCLLS LYNAAYVRTH GE--KVLDEA ITFTRRQLEA SLLDP-----  
--LEPALADE VHLTL-QTPL FRRLRILEAI NYIP-IYGKE AGRNEA---- -----ILE  
LAKLNFNLAQ LIYCEELKEV TLWWKQLNV- ETNL-SFIRD RIVECHFWM T G-ACCEPQYS  
LSRVIATKMT ALITVLDDMM DTYSTTEEAM LLAEAIYRWE --EN-AAELL P-RYMKDFYL  
YLLKTIDSCG D---ELGPNR SFRTFYLKEM LKVLVR---- -----  
----- GSSQEIKWRN EN-YVP--KT ISEHLEHSGP TVGAFQVACS SFVGMGDS--  
-ITKESFEWL LTY---PELA KSLMNISRL NDTASTKREQ -NA-GQHVST VQCYMLKHGT  
-TMDEACEKI KELTEDSWKD MMELYLTP-- -TEHPK--LI AQTIVDFART ADYMY--KET  
-DG-FTFSHT --IKDMIACL FVDPISLF-- -----\*  
>P1;UP\_ORYSI

Length = 775

-----MPA  
DHMEKTVPTV VPARPPNSEG ERKSTNFHPS LWGDFFLNVE PPTAPQQA-- -CM-KGRAEV  
LREEVRTLLK GLKEVQK--- -----I LDITMAIQRL GLDMYVNEI NELLHFVY--  
----- SSDYNDKDLN LVSLRFYLLR KNGYNM--SS GI--FL-SFK DNEGNFIVD-  
----- ---DTRTLN LYNAANLRVY GE--KVLDEA ATFTISRLEG VL-----  
ESSDSILSTE VSFAL-EAPI FRRARIVEMR NYIP-IYEIE ATRNET---- -----ILE  
FAKLNFNLLQ LLYCEELNKI TLWWKELKV- KSNL-SFSRD RIVEMYFWMN G-ALYEPHYS  
HSRIILTRVT AFMTIIDDIF DTYGTTEESM LLAEAINRWD --ES-AIGLL P-EYIRGFYA  
YLLKTFDSFE E---ELAPEK RYR----- LKRLVQ---- -----  
----- AYTKELKWRD ED-YTP--KT LEEHFEVSMR SSGGFTLAAA SFVGMDDI--  
-ATKDIFEWI LSY---PSLF KTFDIFVRLS NDIIVSNKREQ -TG-DHYAST IQCYMKEHGT  
-TIHETYQRL RELIEDSWKD MVEHCTNP-- --IDDQPLIV PQTVVNFART VTTMY--THG  
-DA-FTSSHT --IKEMISSI YVVP IQV--- -----\*  
>P1;W5\_ZEAMH

Length = 775

-----  
-----MAADE ARSVSRLHSE EDMHGKHHST LWGDFFLHHV PCRPGQYS-- --IMKDNVKI  
MKKEEVKMLL DVGSSDLS-- -----HK LECIDTLERL GLDYHYTKEI DELMCNVF--  
----- EARDQDLDLT TTSQFLYLLR KHGYHV--SS DV--FL-KFG DDKGDIVTD-  
----- ---DARCLLR MYEAAHVRVN GE--EILDNI LIHTKRQLQC IVD-----

-DLEPTLOEE VRYAL-ETPL FRRLNRVQAR QFIS-TYEKS TMRNNM---- -----LLE  
FSKLDFNILL TLYCEELKDL TMWWKEFQAO ANTT-IYARD RMVEMHFWM G-VFFEPQYS  
YSRKMLTQLF MIVSVLDDLY DSHCTTEEGN AFTAALQRWD --EE-GVEQC P-TYLRTLYT  
NIRATVKAIE ED---LNLQN NKHAKLVKGL IIDMAM---- -----  
----- CYN AET EWRD KK-YVP--AT VDEHLKISAR SSGCMHLVSQ GFISMGDV--  
-ATSEALEWA STY---PKIV RAVCIIARLA NDIMS YKREA -SN-NTMVST VQTC AKEYGT  
TTVEQAIEKI RELIEEAWMD I THECLRQ-- --PQPM--AL LERAVNLART MDFLY--KDV  
-DG-YTDSWS --IKGILDSL YVHLID---- -----\*

>P1;XY\_ZEADI

Length = 775

-----  
-----MAADE ARSVSR LHSE EDMHGKHHST LWGDFFLHHV PCRPGQYL-- --IMKDKVKI  
MKEEVKKMLL DVGSSDLS-- -----HK LDCINTLERL GLDYHYTKEI DELMCNVF--  
----- EARDQDL DLT TTSQLFYLLR KHGYHV--SS DV--FL-KFR DDKGDIVTD-  
----- --DARCLLR MYEAAHVRVN GE--EILDNI LIHTKRQLQC IVD-----  
-DLEPTLOEE VRYAL-ETPL FRRLNRVQAR QFIS-TYEKS TTRNNM---- -----LLE  
FSKLDFNILL TLYCEELKDL TLWWKEFQAO ANTA-IYARD RMVEMHFWM G-VFFEPQYS  
YSRKMLTQLF MIVSVLDDLY DSHCTTEEGN TFTAALQRWD --EE-GVEQC P-TYLRTLYT  
NIRATVKAIE ED---LNLQN NKHAKLVKGL IIDMAM---- -----  
----- CYN AET EWRD KK-YVP--AT VDEHLKISAR SSGCMHLVSQ GFISMGDV--  
-ATSEALEWA STY---PKIV RAVCIIARLA NDIMS YKREA -SN-NTMVST VQTC AKEYGT  
TTVEQAIEKI RELIEEAWMD I THECLRQ-- --PQPK--AL LERAVNLART MDFLY--KDV  
-DG-YTDSRS --IKGILDSL YVHLID---- -----\*

>P1;SS\_ZEAMM

Length = 775

-----  
-----MAADE ARSVSR LHSE EDMHGKHHST LWGDFFLHHV PCRPGQYL-- --IMKDNVEI  
MKEEVKKMLL DVGSSDLS-- -----HK LDCIDTLERL GLDYHYTKEI DELMCNVF--  
----- EARDQDL DLT TTSQLFYLLR KHGYHI--SS DV--FL-KFR DDKGDIVTN-  
----- --DARCLLR MYEAAHVRVN GE--EILDNI LIHTKRQLQC IVD-----  
-DLEPTLOEE VRYAL-ETPL FRRLNRVQAR QFIS-TYEKS TTRNNM---- -----LLE  
FSKLDFNILL TLYCEELKDL TLWWKEFQAO ANTT-IYARD RMVEMHFWM G-VFFEPQYS  
YSRKMLTQLF MIVSVLDDLY DSHCTTEEGN AFTAALQRWD --EE-GVEQC P-TYLRTLYT  
NIRATVKAIE ED---LNLQN NKHAKLVKGL IIDMAM---- -----  
----- CYN AET EWRD KK-YVP--AT VDEHLKISAR SSGCMHLVSQ GFISMGDV--  
-ATSEALEWA STY---PKIV RAVCIIARLA NDIMS YKREA -SN-NTMVST VQTC AKEYGT  
TTVEQAIEKI RELIEEAWMD I THECLRQ-- --PQPM--AL LERAVNLART MDFLY--KDV  
-DG-YTDSRS --IKGILDSL YVHLID---- -----\*

>P1;6H\_ZEAMP

Length = 775

```
-----MAADE ARSVSRLHSE EDMHGKHHST LWGDFFLHHV PCRPGOYL-- --IMKDNVEI
MKEEVKKMLL DVGSSDLS-- -----HK LDCIDTLERL GLDYHYTKEI DELMCNVF--
-----EARDQDLDLT TTSQLFYLLR KHGYHI--SS DV--FL-KFR DDKGDIVTN-
-----DARCLLR MYEAAHVRVN GE--EILDNI LIHTKRQLOQ IVD-----
-DLEPTLQEE VRYAL-ETPL FRRLNRVQAR QFIS-TYEKS TTRNNM---- -----LLE
FSKLDFNILL TLYCEELKDL TLWWKEFQAO ANTT-IYARD RMVEMHFMM G-VFFEPQYS
YSRKMLTQLF MIVSVLDDLY DSHCTTEEGN AFTAALQRWD --EE-GVEQC P-TYLRTLYT
NIRATIKAIE ED---LNFQN NKHAKLVKGL IIDMAM---- -----
-----CYNAETWRD KK-YVP--AT VDEHLKISAR SSGCMHLVSQ GFISMGDV--
-ATSEALEWA STY---PKIV RAVCIARLA NDIMSYPKREA -SN-NTMVST VQTCAYEYGT
TTVEQAIEKI RELIEEAWMD ITHECLRQ-- --PQPK--AL LERAVNLART MDFLY--KDA
-DG-YTDSRS --IKGILDSL YVHLID---- -----*
```

>P1;Y1\_MAIZE

Length = 775

```
-----MAADE ARSVSRLHSE EDMHGKHHST LWGDFFLHHV PCRPGOYL-- --IMKDNVEI
MKEEVKKMLL DVGSSDLS-- -----HK LDCIDTLERL GLDYHYTKEI DELMCNVF--
-----EARDQDLDLT TTSQLFYLLR KHGYHI--SS DV--FL-KFR DDKGDIVTN-
-----DARCLLR MYEAAHVRVN GE--EILDNI LIHTKRQLOQ IVD-----
-DLEPTLQEE VRYAL-ETPL FRRLNRVQAR QFIS-TYEKS TTRINM---- -----LLE
FSKLDFNILL TLYCEELKDL TLWWKEFQAO ANTT-IYARD RMVEMHFMM G-VFFEPQYS
YSRKMLTQLF MIVSVLDDLY DSHCTTEEGN AFTAALQRWD --EE-GVEQC P-TYLRTLYT
NIRATIKAIE ED---LNFQN NKHAKLVKGL IIDMAM---- -----
-----CYNAETWRD KK-YVP--AT VDEHLKISAR SSGCMHLVSQ GFISMGDV--
-ATSEALEWA STY---PKIV RAVCIARLA NDIMSYPKREA -SN-NTMVST VQTCAYEYGT
TTVEQAIEKI RELIEEAWMD ITHECLRQ-- --PQPK--AL LERAVNLART MDFLY--KDA
-DG-YTDSRS --IKGILDSL YVHLID---- -----*
```

>P1;R6\_ZEALU

Length = 775

```
-----MAADE ARSVSRLHGE EDMHGKHHST LWGDFFLHHV PCRPGOYL-- --IMKDNVEI
MKEEVKKMLL DVGSSDLS-- -----HK LDCIDTLGRL GLDYHYTKEI DELMCNVF--
-----EAMDQDLDLT TTSQLFYLLR KHGYHI--SS DV--FL-KFR DDKGDIVTN-
-----DARCLLR MYEAAHVRVN GE--EILDNI LIHTKRQLOQ IVD-----
-DLEPTLQEE VRYAL-ETPL FRRLNRVQAR QFIS-TYEKS TTRNNM---- -----LLE
FSKLDFNILL TLYCEELKDL TLWWKEFQAO ANMT-IYARD RMVEMHFMM G-VFFEPQYS
YSRKMLTRLF MIVSVLDDLY DSHCTTEEGN AFTAALQRWD --EE-GVEQC P-TYLRTLYT
```



NIRATVKAIE ED---LNLQN NKHAKLVKGL IIDMAM-----  
----- CYNAETEW RD KK-YVP--AT VDEHLKISAR SSGCMHLVSQ GFISMGDV--  
-ATSEALEWA STY---PKIV RAVCIIARLA NDIMS YKREA -SN-NTMVST VQTC AKEYGT  
TTVEQAIEKI RELIEEAWMD I THECLRQ-- --POP K--AL LERAVNLART MDFLY--KDV  
-DG-YTDSRS --IKGILDSL YVHLID-----

>P1;JA\_ZEAP E

Length = 775

-----  
-----MAADE ARSVSKLHSE EDMHGKHHST LWG DFFLHHV PCRPGQYL-- --IMKDNVEI  
MKEEVKKMLL DVGSSDLS-- -----HK LDCIDTLERL GLGYHYTKEI DELMCNVF--  
----- EARDQDL DLT TTSQ LFYLLR KHGYHI--SS DV--FL-KFR DDKGDI VTD-  
----- --DARCLLR MYEAAHVRVN GE--EILDNI LSHTKRQLQC IVD-----  
-DLEPTLQEE VRYAL-ETPL FRRLNRVQAR QFIS-TYEKS TTRNNM---- -----LLE  
FSKLD FNILL TLYCEELKDL TLWWKEFQAO ANTA-IYARD RMVEMHFMM G-VFFEPQYS  
YSRKMLTQLF MIVSVLDDLY DSHCTTEEGN TFTAALQRWD --EE-GVEQC P-TYLRTLYT  
NIRATVKAIE ED---LNLQN NKHAKLVKGL IIDMAM-----  
----- CYNAETEW RD KK-YVP--AT VDEHLKISAR SSGCMHLVSQ GFISMGDV--  
-ATSETLEWA STY---PKIV RAVCIIARLA NDIMS YKREA -SN-NTMVST VQTC AKEYGT  
TTVEQAIEKI RELIEEAWMD VTHECLRQ-- --POP K--AL LERAVNLART MDFLY--KDV  
-DG-YTDSRS --IKGILDSL YVHLID-----

>P1;RE\_ORYSJ

Length = 775

-----  
-----V SPVEGGDLLH CKPHFDHPN VWG DYFLTFS PCTPSMLL-- -NM-KRKAHV  
SEEQVRRMIL ECSSGPNLHV -----K LELVDTLERL CIDYHYEKEI ENVLRRVHEE  
E----- DDTDNHYDLH TTALRFYLLR KHGYA--SP DV--FQ-RFR DEEGNFTRDD  
NNN----- --GTRSM LS LYNA AHLRIH GE--EILDDA IVFTRNYLQS VV-----  
KHLQSPMADE VCSAL-RTPL FRRPRRVEAR HYIS-VYDKL PTRNET---- -----ILE  
FAKLDFGILQ SLYCEELNIL TMWWKELQL- QDHL-SFARD RMVEMHFMM G-VLFEPQYS  
YGR TMLTKLF IFVSIFDDIY DNYSTLEESK LFTEA IERWD --EE-AAEEL P-GYMKFFYK  
KVLTTMKSIE TD--LKLQGN KHVDYVKNLL IDATR-----  
----- CFYNEVKWRS EG-ADQVAAT VEEHLKISVP SSCCMHVPVY AFVAMGND--  
-VTDDAINW GMAY--PKII TSSCIVGRLL NDIASHEREQ -GSSSSSSST VEACMREHGG  
ITKEEAYAKL RELVEESWMD IAGECLRP-- -AAAQPPPLL EAVVNATRVL D-FVY--KDD  
QDA-YT-HPS SLKDTIHSIY ILSV-----

>P1;29\_ORYSI

Length = 775

--MASFSVHA QPWSSSCQPA AAAPSQRQCS TTPPWRRPWR QPRT RSPGTL RCRQAQQQLL  
LSTGVIQQD- ----AVDDRL NKNPCNFHPS IWG DFFLYHS STTAASYQ-Q -QEWIVQLER

```

LKEEVGNMIT SSVTSSLLE- -----R LHLIDALERL CVNHLFEEEI NILLMQISSS
----- NNVNDCDDVH TVAMWFYLLR KHGYKV--SQ DV--FV-KFK DEEGNFIK-
----- --NPMDLLA LYNAAHYRVH GE--KILDDA ILFTKRCLHS MF-----
PSLEGLSARE VKCAL-EIPL PRRVGIYEAN YYIS-TYEKE GKVHDM---- -----IVQ
LAKLNFNLMO LOYQEELDII TRWWKDLQI- QSKL-PFARD RIVECYLWML G-VYYEPNCS
RGRILTKVI SIATIFDDTF DSYGTIEECE LFTKCLESWE ---L-VADEL P-DCMKHVLE
KVFQSYQIIE QE---LSEDE KYRMPYLRSF TEDLVR---- -----
----- NYNREVKMRE ES-YVP--KS VEEHLQISSR TGACHLLACA SLVGM DVT--
-ATKESFDWV STM---PKMV LALCTILRLV DDLKTYEREQ -LT-PHVASS IDSYM KQHDV
-SIEMARFKI EELKEEHWKD FNDEWLDP-- -DSAQP-RKL LEAIFNLTRT MEFIY--NQA
-DN-FT-YCH -NLKDTISSL LVEAFPV-N- -----*

```

>P1;HW\_MAIZE

Length = 775

```

----- --MAGAVA SPGKRIPPSP IGCTSRAASG VAVSASATVA
APASSSRQA- ----KEDDGA SRNVSGFEPS IWGDFFLTYS SPLATSSLHK -AWMVHRAEQ
LKEQVAAKLV AASSSACSLH R-----R IHLIHVLERL CLDHLFEDEI SDMLARMN--
----- DVDVSGCDLQ TVAMWFYLLR KHGYSV--SS DV--FA-EFR DEQGGGFTAN
----- --SARDLLS LHCAACLATR GE--TILDEA ISFTAKSLKS TAP-----
YTGAASLACE IKRAL-EIPL PRRVRIYEAK SRIA-EYGRE AEDEL---- -----VME
LAKLNYNLVQ LOYQOELKII TRWWNGLEL- QSRL-SFARD RVVECYFWIV G-VYFEP SYS
RARIILTKVI AIVSLLDDTY DVYGTPOECE LFTECIESWD --PA-VAGGL P-ENMKFIFG
KILDTYQSIE EE--LAP-EE KYRMPYIKNF IIDLVR---- -----
----- AYNKEVRWRE QG-YVP--AT VEEHLQVSAR SGACHLLSCA SFVGMGDV--
-AGEEAFEWV CSV---PKLV QALCIILRLS DDLKSYEREK -MA-PHVAST IESCMREHEV
-PLEVARVKI QEMIDETWKD FNEEWLNM-- -NKHQP-AEL LERIFNLTRT MVYMY--KND
-DA-YTN-CH -VIKDTINSL FVEPVFIA-- -----*

```

>P1;HQ\_ORYSA

Length = 775

```

----- --MFSSTGSR S TTSLAPCLSP QSGVSNHKPS VWGDFFITYT POPLORSE-- -EWMRQRADN
LREKVRTLFR TSGDVVA--- -----R MKLVDSIQHL GVGHLFNEEI STTSLDIH--
----- ASEFTSSSLY EVALRFLLR EHGLWV--SP AT--FN-IFK DDDGRFINEI
AD----- --EPSSLLS LYNAAYLLVH DE--PELEEA ISFSRHHLS MMQC-----
GNLKHPLADQ VKRAL-HLPL PRYKRVETL HYLS-EYGQE EGHISF---- -----LLD
LAKVDFNILQ GVHLKELKAI SEWWKDLTG- YVGL-SYLRD RLVESYTWSQ M-LFYEEGLA
LTRIIFTKII VLMVIMDDTY DSHATIQECR KLNEAIQRWD --ES-ALFLL P-EYLKKFYN
ELLNNFKEFE D---QVAIND KYRVAYAKKE FQKLSH---- -----
----- YFLQEAESH NN-YKP---S FEEQVALSTK TSTVQLLCVS TTVGRGDA--
-ISSEAFQWA AS-----SSTV TSCAKILRFM NDIASFCKGK -NK-GDMVST VECYMNEHKV

```

-ISEVAFKL DSLIEDEWRT MNHARYEH-- --HQLL--PV VQRVLNMAIS IMFFY--DKR  
KDA-YT-FST -HLQEIVRSL FVNPIPI--- -----\*  
>P1;CD\_ORYSA

Length = 775

-----  
----- --MASHDAIA PEKTTNYEPS VWGDFFINYR POPLQRSE-- -EWMRQRAKR  
LKMNVRTLFW TSNDVVV--- -----R MNLVDAVQRL GIGHLFKDEI RRTLNDIH--  
----- QSEFTSSSLH EVALRFLLR EHGLWV--SP VT--FN-KFK GDDGRFMNGI  
AD----- --EPRGLLS LYNAAYLLVH DE--PELEEA ISFSRYHLKS MMQG-----  
NNLKHPLSDQ VKRAL-NTPL PRTSKRTETL HYLS-EYGQE EGHMSI---- -----LLD  
LAKVEFNLLQ GVHLKELKAI SEWWRDLNE- HVEL-SYLRD RVVESYTCSH M-LFYEEGLA  
FTRITFTKII VLIIMDDTY DSHATIOECR KLNEAIQRWN --ES-AVSVL P-EYLKNFYH  
KLLNNFKEFE N---QVVVSE KYRVAHAKKE FQILSH---- -----  
----- YFLQEAESH NN-YKP---S FEEQLALSTK TSTVQLLCVS TTVGRGDA--  
-ITNEAFMWA AS----STTV TSCAKIMRFM NDIASFERGK -NK-GEIAST VECYMNEHNI  
-ISEVAFKL DSLVEDEWRT INQARCEH-- --HQLL--PV VQRVVNLAIC IMFFY--DKR  
KDA-YT-FST -HLQEIVRNL FINPITM--- -----\*  
>P1;WY\_ORYSA

Length = 775

-----  
----- --MFFA AHVGVLSTVK ISPCPSTIRP NRSRACRVRV  
AESLSPSIA- ----SGDPNA PEKLFYFEPS VVWNFFINHN PRPLQRSD-- -EWMRHKADK  
LKENVRKLIW TSNDVVA--- -----K MNLVDIAIQL GIGHLFEDEI SCILSDIH--  
----- KSEFTSSSLH EVALRFHLLR EHGLWV--SP DV--FN-KFK ADDGKFIDEV  
AN----- --EPRDLLS LYNAADLLVH DE--PELEEA ISFSRYHLKT MMQH-----  
NDLKQPLFDK FSRAL-HLPL PRTYKRVETL HYFL-EYGQE EGHIPI---- -----LLD  
LAKLDFNIIQ RVHLKELKAI SEWVKDLYK- YIGL-TYISD RAVESYIWSH T-MLFGEGLA  
LTRMICAKII ILLVIMDDTY DAHATIEESR KLNEAIQRWD --ES-AIPRV P-EYLKIFYI  
KLLNNFKEIE D---QVMDNE KYKVAYAKKE FQKLSH---- -----  
----- YYLQEVVWLH QN-HKP---S FQEQVDLSTK TSTAHLMFVS TTVGLGDA--  
-VTKEALEWA ES----STAI VAVGKIMRFM NDIAAFKHGK -NK-GDVTST MECYMNEHKV  
-ISDVAFMKL TSLIEHEYRT INQARFEL-- -HKSLLP-AAQ RVVILAVV-S LMFFY--DNR  
KDV-YT-LCS -DLRETIRSL YVEHAPM--- -----\*  
>P1;BK\_ORYSJ

Length = 775

-----  
----- --MST SIPLPFFFFSH GVVHARIGHR PIQPSVGLLS AGAPAKVSFR  
RQSSAHRHAA HVVSSSITP VKEVSSFEPV VWGDFFINYD PKPLQRSE-- -DWMMEKADK  
LKQDVRILFE THNDTAK--- -----K MHLVDAVQRL GIDHLFQDEI NNAISDIK--  
----- ESEFTSSSLH EVALHFLLR EHGIWV--SP DV--FE-KFK GEDGRFINTI  
AD----- --EPRALLS LYNAHLLVH DE--PELEEA MSFARHHLES MRDG-----

SRLKAPLDNQ INRAL-HLPL PRTYKRVEML HYML-EYGQE EECIVV---- -----LLD  
LAKLEFNLLQ HVHLKELKAF SQWWKDLYG- YVEL-SHVRD RAVESYLWSY A-LFYEENLT  
LTRMILAKII VFIVLMDDTY DDHATIEEER KLNEAIQRWD --ES-AISLL P-EYMKKFYR  
ALLNYFRETE A---QVEASD KYRVTCMKKE FQNLST---- -----  
----- YYLQEFEWLH QN-YKP---A FKERVALSTL SSTVPLLCVT AAVGQGDAA--  
-VTKESFELT TVR---SSAV IACAKIMRFM NDIAAFKSGR KNK-GDAANT VECYINEHKV  
-TSEVALDKI ESMIESEWRT LNQVRCDH-- --QKQF--HV VQVRMNLAVA VPPFFY--DKK  
KDA-YT-FSK -YHQGNVGNL FVNPVTL--- -----\*

>P1;EQ\_ORYSJ

Length = 775

----- --MDNRKKNL DRTTHILNHR SATSVARRTS  
ARTRARRRER TTETHRGYLV LRSSCCPIFL VVFLKMELAG CRNKRRSRSE -GWMVERAEK  
LKDDVRTMFE TCDSTEG--- -----R LQLVDAIQHL GIDHLFKEEI EYSLSEIN--  
----- ASEFISSSLH DVALRFLLR QHGFBV--SP DV--FN-KFK GDDGRFVSGI  
TN----- --DPRGLLS LYNAHLLTH DE--PELEEA ISFATQHLAS LSSG-----  
TDLNPHLIDQ INRAL-DVPL PRTYRRMETL CYMP-EYRQE EGHIPI---- -----LLE  
LAMLDFNLLQ HVHLKELKAI SEWWKDLYG- YMGL-SYIRD RVVESYVWSY V-VFYEDSA  
LARMIFTKII AFIIIMDDTY DSYATIOEER KLNEAIQRWD --ES-ATAFL P-EYIKKFYS  
ALLKTFKEFE I---HVEDDG QYRIDHTKKA FQNLASA---- -----  
----- YYLQEAESY QN-YKP---S FEEQVALSTV TSTVPLLCVS TTVGRGDA--  
-LTNEAFEWA AND---IGAK IACAKITRFM NDIAAFKRGR KNR-GDVVST VECYMNENKV  
-TSEGAFTKI DLMIEDEWRT INQALCEH-- ----- -QVLAWAKEK RPSAT--NAR  
MIK-EV-DWG -PNQDLFQVY FYFTT----- -----\*

>P1;ZA\_ORYSA

Length = 775

----- --MASSDTPT HEEALSFEPS IWGDFFINYE POPLQRSE-- -RWMQERAER  
LRGQIQTLFG TCHDMSA--- -----R MNLVDSVQHL GIDHLFQEEI EDALTSIH--  
----- GSEFRSSSLY EIALRFLLR EHGFVW--SP DA--FN-KFK GDDGKFRNDI  
AN----- --DPKGLLS LYNAHLLIH GE--PELEEA ISFARKHLEL MSQD-----  
SVLNPPLAEQ VKRAL-SLPL PRTFKRVETI CYMS-EYERE AGNIPI---- -----LLE  
LAKLDFNLLQ HIHLEELKAI SEWWKDLYG- YMEL-RYIRD RTIEAYAWSY M-MFYEDFA  
FTRMFVAKII ALDVTMDDTY DAHATVEEER QLNTAIQRWD --KS-AISIL P-EYLKIFYI  
KLLINFEEFE H---QVSDNE KYKVITYTKQE FORQST---- -----  
----- YYLQEAESY QK-HKP---S FKDQVVLSTK SSAVEQLVCVA AMIGWGNA--  
-VTTEAFEWA ASG---NDAV IACAKIGRFM NDIAAFKCGK -NK-GDVASS VECYMNENRV  
-TSEVAFKI DSLVEDEWRT TNQTRLEH-- --GTL--PM VQRVVNFTVS MVLFY--DDR  
NDA-YT-FAT -LLREIIESL FVRPAPI--- -----\*

>P1;MB\_ORYSA

Length = 775

```
-----  
----- --MVS RDSAV HEEVLGFEPS VWGDFFINYE POPLORSE-- -TCMQERA EK  
LKGDIRTFLG TCNDISA--- -----R MNLVDSIQHL GIVHLFQEQI EDALMSIH--  
----- ESEFTSSSLY EVALRFLLR EHGFWV--PP DA--FN-KFK GDDGRFRNEI  
AN----- ---DPRGLLS LYNAHLLIH GE--PELEEA ITFAREHLKL MSQD-----  
NVLNPPLACQ VRRAL-TLPL PRTFKRVETI CYML-EYQLE EGNIP I-----LLD  
LARLDFNLLQ HIHLKELKAI SEWWKDLYG- YMGL-SYIRD RTIEGYTWSY M-MFYEEGFA  
FTRMFVAKLI ALVTVMDDTY DAHATIEECH QLNTAIQRWD --KS-AISIL P-EYLKKYYS  
KLLINFKEFQ D---QVTDNE KYMVACTKEE FQKQST---- -----  
----- YYLQEAESWN QK-YKP---G FKDQVVLSTK SSAVQLLCVA AMVGWGGT--  
-MTTEAFEVW ASG---NAAV IACAKIGRFM NDIAAFKRGK -NK-RDVASS VECYMNENGV  
-TSEAAFAKI NALVEDEWRS TNQTRLEH-- --RTLL--PM VQRIVNFTVS MALFY--DDK  
KDA-YT-FGT -LLREIVESL FVKPVPI--- -----*  
>P1;JP_ORYSJ
```

Length = 775

```
-----  
-----MD DPSKQRRWHS TENKSEGRTR OHGEGLRTH AYDCGKCA-- -HT-VSVVAA  
AREMDEREIR SVKKGQ---- -----K MNLVDTLQRL GIDHLFEEEI ATTLNTH--  
----- GA EFDSPSLH DVALRFLLR QOGLWV--SS DV--FN-KFK HRDGSFIIDI  
TN----- ---DPKGLLS LYNAANLLTH NE--EALQEA ILFSRHHLEL MK-----  
SNLKSPLAEQ VSRAL-QIPL SRNLKRVEAL SYIL-EYNVH EQTYNPS--- -----ILE  
LAKLDFNLLQ HIHQRELKTI TQWWEDLSN- DIGL-DYIRD RIVECYFWSY S-MYFEEEYT  
RARMILAKFF MLTSLDDDTY DTHATLEECR NLNVAIQSWD --ES-DISVL P-DYLKFFL  
KVMSNFVEFE N---ELEPHI RHRNAYNRKV FQLLSG---- -----  
----- YYLQEA EWFH HN-YVP---S FKEQIEVSVM SAGIQALSVC ILVGMGNI--  
-VTEETLEWA IGN---NDAV RAGGEVARFM DDMAAFKNGR -NK-LDVASS VECYIKEYNV  
-TSEVALAKI GSLVEDAWKT INQAHIDR-- -RELLP---F VHRVTNLSRS MAILF--LDK  
RDA-YT-YSK -DFKRTMESH FVKPIPL--- -----*  
>P1;QM_MAIZE
```

Length = 775

```
-----  
----- --MATTGTT SMPAPVFHPT VWGDYFIK FV PEPLQVSD-- -ETMAERIRH  
LREEVSGMFQ ACKNVVD--- -----K TNLVDVVQRL GIDHHFEEQI ATALASIHS-  
----- AGLFNSSSLH EAALRFLLR QOGFWV--PA DE-LVK-FIK NEDGSFIDGI  
TN----- ---DPKGLLS LYNAAHLVTH DE--GTTTLE DAIAFARQHL EAARR-----  
CSLKSPLAEQ VGRAL-GIPL PRTLKREEAI AFIP-EYSSQ QDQOVYSPV- -----ILE  
LAKLDFNLLQ HLHQEELKEI SQWWKDLGSG- EIGL-GYVRD RIVECYFWSY T-VHYERGQA  
RARMILAKVF MLTSLDDDTY DVHATLEEAR ELNKAIQRWD --ES-DVSL P-EYLKFFV
```

KVISNFRFE D---ELESHE KYRNVYNIKG FQTLK-----  
----- HYLQEAWEFH HG-CTP---S FKDQVNVSVI TGGAQVLSIG LLVGMGHE--  
-ATREAFWEA IGD---TDAI WACGEVSRFM DDMSAFKNGR -NK-MDVASS VECYIKEHNV  
-PSEVALARI NSLVEDAWKT INQAPFKY-- -PALFP---V VQRVTSLAKS MTLLF--LDK  
RDA-YT-YSK -DFQTTLETH FVRHIPL--- ----- \*

>P1;8X\_MAIZE

Length = 775

-----  
-----  
-----MAPKT VWGYFFIDYI PEPLQVSD-- ----KQRVVE  
LKGEVARLFE DCNCKDVVE- -----R MNLVDVVQRL GIDHHFKEQI DTALKNIQ--  
----- GAEFNSSDLH EVSLRFLLR QHGLWV--PA DQ--FD-KFR RQEDGSFSSD  
IAD----- ---DPKGLLG LYNAASLLIH GE--EVLEEA LLFARRHLES IRRGGG----  
LHDSPLYSEQ VGRSL-KIPL PRTLKRLEAV SYIP-EYSSA DDTYIHPE- -----ILE  
LARLDFNLLQ HVHQNELRTV TQWWKGLCD- VIGP-DYGRD RIVECYFWAF S-MYEEEEHA  
RARMILARLI MLASLLDDTF DDRATLQECR ELNKAIERWD --ESDDISLL P-ECIQKFFL  
EVIRNFAEFE D---ELEAHE KYRVAYARKA YQLLSK-----  
----- SYLQEVVEWCH QG-YTP---S FDDHVSVSTA SAGIQVLCVG MLVGMGDA--  
-ATKEVFWEW IGSN--NRVV RACAEVTRFM DDMADFKRGK -NK-TDVATT VECYMKEQNV  
-TGEVAFDKI GSFVEDAWKT LNQAALVG-- -DRALL--PV VQRVAGLAMS MMVFF--HGK  
IDR-YT-DSE -HLKETLEDL FVNHVPLC-- ----- \*

>P1;6S\_ORYSJ

Length = 775

-----  
-----  
-----MAPAFHPAIF GDFFINNVQP SPKESDEW-- -M--EERVDQ  
LVEEVGRMLE VCKDDVVK-- -----Q MNLVDVLQRL GIDHHFEEQI DTILKNIH--  
----- RAEFNSSDLY EVALRFLLR KQGYWV--SP DE--FN-KFK AEDGSFSSDD  
ITN----- ---DPKGLLS LYNAHLLTH NE--KALEEA ILFARHHLQL LR-----  
GNLAYPLDEQ VTRAL-EIPL PRTMKRVEVL NYIF-EYSAE EKMFNPS--- -----ILE  
LAVLDFNILQ KVHQNELKEI CQWWENLSS- DIRL-DYVRE RVVECYFCAY A-AYYEKEHA  
RARMIFAKRC MLFSLDDTY DVRATLEEAR KFNDALQRWD --KS-DVSSL P-EDLKRFFL  
SIISNFRFE D---ELEPHE KYRNSYNIKA FQILSS-----  
----- NFLQEAWEFH QN-YIP---C FTDHVTVSLQ TGGAIELPVS LIVGMGDI--  
-ATKEVLDWA LAN---PDAG RAFAEVARFM DDLAASHSGR -DK-MDVAST VECYMNEHGV  
-TREVAEAKI AGMAEDGWKS MNQIRFKH-- -RAFLP---F VQRIANLCMS ATLLY--HGK  
KNG-FS-NSL -ELKDMFESH FVNPIPLNHI DYD----- \*

>P1;X2\_ORYSJ

Length = 775

-----  
-----  
-----MAA  
SKAAAANQPL E-----MDAV VNGGAGFDLS SDSYKLNLLI NGCEERM--- ----RARAER

LAGEVRRRMF AAGGGNGDGE GGVTMSVAEA ATLVDTLERL GLDGHFRHEI GVLLGRLRRE  
EA----- DFAGSDDDL Y TVALRFLLR QHG VV--SA GTCVRD-KFR DGTCFSFSSSL  
RD----- ---DPRGLLS LYNAAHMAAP VE--IALDDI IAFARCHLEA LSME-----  
GELKSPLAEQ VSRAP-DIPL PRFPRRLETM SYLV-EYEQE DEHDDM---- -----LLE  
LARLEFELTR CLHLEELKAL SLWWRELYE- SVKL-SYARD RLVESYFWTC G-VFHEEEYS  
RARIMFAKVF GLLSLMDDTY DVHATLEECY KLNEAIQRWD --EG-AISIL P-EYLRMFYI  
KLLSNFDELE A---SLEPHE KFRVSYAKNA FKLSS-----  
----- YYLREAKWSN TK-YTP---S FAEHLEVSVM SSGFPMLAPV VLMGVHDDAA  
VATAAAFEEWA TAAGVPDVVI AASGEVARFL NDIASHRVGK -NE-KDVPSS VESYMAEHGV  
-GEEAALAAV AAMAHEGWRT INRALMEM-- -DPGLL--PA ARLIVNLTRT LEVIY--LGG  
RDG-YT-FGG -DIKGLVVSL FLDPVAVIRI -----\*  
>P1;QM\_ORYSJ

Length = 775

-----MAA MESRRLGAEG QSRRRRVGGQ RGRPHAPPAP PRSNSPVATD  
ASPCALANLH QRERERDLGR QEEK----- -WGTKCKYVA TLDRHRSE-- -EWMRERVDR  
LKMQVGCIL KTINVPY--- -----T VMLVDVLERL HIDNHFRDEI ATALQHVFFH  
DEQQKAA--- AGFDDGDQLY LESLRFLLR QHGFVW--SA DV--FD-KFK DSTGCFRESL  
ST----- ---DARGLLS LYNAHLAMP GE--AALDDA IAFSRRSLOS LQ-----  
GALRSPMAKQ VSRAL-DIPL PRAPKLETM HYIT-EYEQE AAHDGM---- -----VLE  
LARLDFELVR SLYLKEKAL SLWWRQLYD- SVQL-SYARD CLVESYFWTC A-MFHGEDYS  
RARIIFAKVF QLMTMTDDIY DIHATLEECY KFNEAVQRWD --KS-AVSIL P-EYLRNFYI  
RILNDFDEME D---SLEPDE KHRMSYVKSS FKQOSE-----  
----- YYLREAQWSS DK-HMP---S FAEHLDVFSM SIGYPTMAVV VLLCARDG--  
-DGAAASMEA SEWA--PSLV RAGGEVTRFL NDIASYKTGK -SG-KDAAST IECYMAERGV  
-GGEEAVAAV AALVESAWRT INRACVEM-- -DPNLL--PA ARLLVNLATT PEVIY--FGG  
RDG-YT-VGA -DLKGLVTAL FLDPLRV--- -----\*  
>P1;MF\_ZINZE

Length = 775

-----MEKQSL TFDGDEEAKI DRKSSKYHPS IWGDYFIQNS SLTHAKES-T -QRMIKRVEE  
LKVQVKSMFK DTSDDLQ--- -----L MNLINSIQML GLDYHFENEI DEALRLIY--  
----- EVDDKSYGLY ETSLRFQLR QHGYHV--SA DI--FN-KFK DDNGSFISL  
NG----- ---DAKGLLS LYNVSYLGTH GE--TILDEA KSFTKPQLVS LMS-----  
-ELEQSLAAQ VSLFL-ELPL CRRNKILLAR KYIL-IYQED AMRNNV---- -----ILE  
LAKLNFNLLQ SLYQEELKKI SIWWDNLAFL AKSL-SFTRD RVVEGYWVWL T-IYFEPQHS  
RARVICKVAF AFLSIMDDIY DNYGILEECT LLTEAIKRWN --PQ-AIDGL P-EYLDKYLL  
KLLKTFEEFE DE---LELNE KYRMLYLQDE VKALAIS---  
----- -YLQEAkwGI ER-HVP---S LDEHLHNSLI SSGSSTVICA SFVGMGEV--  
-ATKEVFDWL SSF---PKVV EACCVIGRLL NDIRSHELEQ -GR-DHTAST VESYMKHEDT

-NVDVACEKL REIVEKAWKD LNNESLNP-- -TKVPR--LM IERIVNLSKS NEEIY--KYN  
-DT-YTNSDT -TMKDNISLV LVESCDYFNK -----\*  
>P1;N9\_ZINOF

Length = 775

-----  
-----MENQS LTFVGDDEAK VRKSTKFHPS IWGDYFIQNS SLSHAEES-T -QRMIKRVEE  
LKVQVKSMFK DTSDILQ--- -----L MNLIDSIQML GLDYHFENEI DKALRLIN--  
----- EVDDKSYGLY ETSLRFLLR QHGNHV--ST DI--FN-KFK GDNGSFISL  
NG----- ---DAKGLLS LYNASYLGTH GE--TILDEA KSAKPOLIS LL-----  
SELEQSLAAQ VTLFL-ELPL HKRVKILLVR KYIL-IYQEG AMRNNV---- -----LLE  
FAKLNFNLLQ SLYQEELKKI SIWWYDLAL- AKSL-SFTRD RIVECYWVWL T-LYFDPQYS  
HSRLIYSKVI SLVSIMDDIY DNYGTLEECR QLTEAIKRWK --PQ-AIDSL P-EYLKYFYL  
KLLKTFEEIG EE---LEHNE KYRMLYLQDQ IKAIIV---- -----  
----- AYLEEAKWSI ER-HVP---S LDEHLHYSLI TSGCSLVPCA SYVGMGEV--  
-ATKEVFDWH SSF---PKAV EACCAIGRIL NDITSYEREQ -GR-GDNAST VESYMKDHGT  
-NEKDACKKL QEIVEKAWKD LNQESLNQ-- -KNISR--LI IERLVNFSRS MEEIY--MSN  
-DM-YTNSGT -KMKGNITLV LVEAFPV--- -----\*  
>P1;SP\_ZINZE

Length = 775

-----  
-----MERQS MALVGDKEEI IRKSFYHPT VWGDYFIRNY SCLPLEKEC- ---MIKRVEE  
LKDRVRNLFETHDVLQ--- -----I MILVDSIQLL GLDYHFEKEI TAALRLIY--  
----- EADVENYGLY EVSLRFLLR QHGYNL--SP DV--FN-KFK DDKGRFLPTL  
NG----- ---DAKGLLN LYNAAYLGTH EE--TILDEA ISFTKCQLES LLG-----  
-ELEQPLAIE VSLFL-ETPL YRRTRRLLVR KYIP-IYQEK VMRNDT---- -----ILE  
LAKLDFNLLQ SLHQEEVKKI TIWWNDLAL- TKSL-KFARD RVVECYWIV A-VYFEPQYS  
RARVITSKAI SLMSIMDDIY DNYSTLEESR LLTEAIERWE --PQ-AVDCV P-EYKDFYL  
KLLKTYKDFE DE---LEPNE KYRIPYLQEE IKVLSR---- -----  
----- AYFQEAQWGV ER-YVP---A LEEHLLVSLI TAGYFAVACA SYVGLGED--  
-ATKETFEWV ASS---PKIL KSCSIHCLRM DDITSHQREQ -ER-DHFAST VESYMKEHGT  
-SAKVACEKL QVMVEQKWKD LNEECLRP-- -TQVAR--PL IEIILNLSRA MEDIY--KHK  
-DT-YTNSNT -RMKDNVSLI FVESFLI--- -----\*  
>P1;C9\_ELAOL

Length = 775

-----MSSN  
TMEAHGSTNH SSVPCGGDGT IREFLANFHPT IWGDYFIENY PLPSNLQKSE -ACIEKRREE  
LKVEVMNLLK NANDYLQ--- -----E MELIDILQRL GVAYHFEEKI DEILSQIF--  
----- KEHMEDDNLH AVALRFLLR QHGYNM--PT NI--FI-KFK EVDGSFKATL  
RN----- ---DVKGLLS LYEAAYLGIP KD--NLLDEA LNFAKLHLKS ME-----



SHMKTPLAVR VLDAF-EMPL HRRTRLEAK NYIS-IYQQD DGRINV---- -----VLE  
LAKLDFHILO SIHREEVRSI SMWWKALGL- AKKL-TFCRD RVVEGYFWIL G-VYFEPQYS  
RARIYLTKVL ALLSIMDDIY DTYGIAEELQ AFTEVIRRWD --IE-AVDQL D-EVYKLYFL  
NLYNTFKEFE DE--LAKEGN SYRVEYLKES VKELSR---- -----  
-----AYLEEVKWRD EG-YVP---P LKEYLNVSQI STVHVALSCA SFVGMGEE--  
-ATKEAFDWV TSF---PRII KSSCLIGRLL DDVASNEFEH -ER-KHVSSA VHCYIKEHGT  
-SVQEAYEKL RGMIEDEWKI MNQEYLCM-- -TTMPM--SL IRPIINLPRM AETVY--KKC  
-DS-YTHSLS -TMKDYIMSL LVEPISF--- -----\*

>P1;IG\_9ASPA

Length = 775

-----METLKA I-----  
-----PLSFDS VRQSGDYHPS VWGDYFLSYN PISPPELA-- -PL-KSRMDE  
LKVEIIQMFN NTKDSLQ--- -----M MELIDAIQRL GIGYHFEKEI NEALSRLF--  
-----NTAYDGNDLY TVALRFLLR QNRYHI--SS DD--FN-KFL DEKGDFKDCF  
SS-----DAKALLS IYDAAHLAMA TE--EILDKA INFSKTHLMS MK-----  
SHLEPHFSLM VSSSL-EIPL FKRTDRIKTR NYLS-IYEQD ANFNDV---- -----LLE  
FGKIDFICLO AMHQEEVRR L SMWWKNLGL- SKKL-PFSRD RLVECYFWVL S-VYFEPQYS  
RARTIMTKCI IQMSYLDIY DVYGGLEELR LLTDAIERWD --IK-LIDNL P-DYMQHSFR  
SLIETFKDIE TE--LAPEQN SFRVQYLKYE IKKVAK---- -----  
-----SYLQEATWAN KS-YVP---K LEEHFGVSLI TAGYSFLTCA AYMGMKEF--  
-ISKEVFDWV TSL---PEII KSSCVIGRLM NDIVSFEHEQ -KR-THVASA IQSYAMEHEC  
-SEEEACNKL MEMSNAWKS ISKELVEL-- -SNLPS--SL IWPIINLARF NEFIY--LGK  
-DL-YTNSDH -IMKETINAV LVEPVQMKM NNKADISNSM -----\*

>P1;C5\_MAGGA

Length = 775

-----MDS PTTQRPMEI GRAFVNYHPS IWGEHFIAAS PDVMRLDAH- ----KGRGEE  
LKEVVRNMFS TVNDPLL--- -----K MNLIDAIQRL GVAYHFEMEI DKALGQMYDD  
HI-----NGKDDGFDLQ TLALQFLLR QOGYNV--SS GV--FA-KFK DDEGNFSSIL  
SK-----DTHGLLS LYEAFLGTH GD--DILDEA ITFTTVHLKS TLP-----  
-HVSAPLTKL VELAL-EIPL HRRMERLOTR FYIS-IYEED RERNV---- -----LLE  
FSKLEFLRLQ SLHQREL RDI SLWWKEMDL- LAKL-PFTRD RVLEGYFWTV G-VYFEPHYS  
RARMIMTKMI AFATVMDDTY DVYGTLEELE LLTATIERWN --RG-DMDQL P-DYMKVIFI  
ALLDGVDATE DD--LTGEGK SYRIYYLKEA VKDLAK---- -----  
-----AYLAEARWVS SG-YVP---T SEEYMKVALI SAVYPMLFVA FLIGMDEV--  
-VTKEVLEWA IHM---PTML RTCSIVARLM DDIPS NKLEQ -ER-KHVSSS VECYMKEHGT  
-SYHESIQLK REMVASGWKD INKECLKP-- -TPVPT--AV INVILNFTRV LEIY--QHR  
-DG-YTDASV -ETKEHIASL FVDPIPL--- -----\*

>P1;49\_PICAB

Length = 775

```
-----  
----MAQISK  CSSLSAELNE  SSIISHHHGN  LWDDDFIQSL  KSSNGAPQ--  -Y--HERAAK  
LVEEIKNLV  SEMKDCNDDL  IR-----R  LQMVDIFECL  GIDRHFQHEI  QVALDYVYRY  
WNQLEGIGIG  SRDSLIKDFN  ATALGFRALR  LHRYNV--SS  DV--LE-NFK  NENGQFFCSS  
TVEEK-----  ---EVRCLMT  LFRASEISFP  GE--KVMDEA  KAFTTEYLTK  VLTG--VD-V  
TDVDQSLRE  VKYAL-EFPW  HCSLPRWEAR  SFIE-ICGQN  DSWLKSIMNK  -----RVLE  
LAKLDFNILQ  CAHHRELQLL  SSWWSQSDI-  -AQQ-NFYRK  RHVEFYLVVV  I-GTFEPEFS  
TCRITFAKIA  TLMTILDDLY  DTHGTLEQLK  IFTEGVKRWD  --LS-LVDRL  P-DYIKITFE  
FFLNTSNELI  AE--VAKTQE  RDMSAYIRKT  WERYLE----  -----  
-----  AYLQEAEWIA  AR-HVP---T  FDEYMKNGIS  SSGMCILNLY  SLLLMGQL--  
-LPDDVLEQI  HSP---SKIH  ELVELTARLV  DDSKDFETK-  -VG-GELASG  IECYVKDNPE  
CTLEDASNHL  NGLLDLTVKE  LNWEFVRH--  -DSVAL--CF  KKFAFNVARG  LRLIY--KYR  
-DG-FDVSNO  -EMKTHIFKI  LIDPLT----  -----  -----*
```

>P1;2L\_PICAB

Length = 775

```
-----  
----MAQISK  CSSLSAELNE  SSIISHHHGN  LWDDDFIQSL  KSSNGAPQ--  -Y--HERAAK  
LVEEIKNLV  SEMKDCNDDL  IR-----R  LQMVDIFECL  GIDRHFQHEI  QVALDYVYRY  
WNQLEGIGIG  SRDSLIKDFN  ATALGFRALR  LHRYNV--SS  DV--LE-NFK  NENGQFFCSS  
TVEEK-----  ---EVRCLMT  LFRASEISFP  GE--KVMDEA  KAFTTEYLTK  VLTGVDV---  
TDVNQSLRE  VKYAL-EFPW  HCSLPRWEAR  SFIE-ICGQN  DSWLKSIMNK  -----RVLE  
LAKLDFNILQ  WAHHRELQLL  SSWWSQSDI-  -AQQ-NFYRK  RHVEFYLVVV  I-GTFEPEFS  
TCRITFAKIS  TLMTILDDLY  DTHGTLEQLK  IFTEGVKRWD  --LS-LVDRL  P-DYIKITFE  
FFLNTSNELI  AE--VAKTQE  RDMSAYIRKT  WERYLE----  -----  
-----  AYLQEAEWIA  AR-HVP---T  FDEYMKNGIS  SSGMCILNLY  SLLLMGQL--  
-LPDDVLEQI  HSP---SKIH  ELVELTARLV  DDSKDFETKK  -VG-GELASG  IECYVKDNPE  
CTLEDASNHL  NGLLDLTVKE  LNWEFVRH--  -DSVAL--CF  KKFAFNVARG  LRLIY--KYR  
-DG-FDVSNO  -EMKTHIFKI  LIDPLT----  -----  -----*
```

>P1;M5\_PICSI

Length = 775

```
-----  
----MAQISK  CSSLSTELNE  SSIISHHHGN  LWDDDFIQSL  KSSNGAPQ--  -Y--HERAEK  
LVEEIKNLV  SEMKDCNDDL  IR-----H  LQMVDIFECL  GIDRHFQNEI  QVALDYVYRY  
WNELEGIGIG  SRDSLIKDFN  ATALGFRALR  LHRYNV--SS  DV--LE-NFK  NENGQFFCSS  
TVEEK-----  ---EVRCLMT  LFRASEISFP  GE--KVMDEA  KAFTTEYLTK  VLTG--VD-V  
TDVDQSLRE  VKYAL-EFPW  HCSLPRWEAR  NFIE-ICGQN  DSWLKSIMNK  -----RVLE  
LAKLDFNILQ  CAHHRELQLL  SRCWWSQSD-  IAQQ-NFYRK  RHVEFYFWVV  I-GTFEPEFS  
TCRITFAKIA  TLMTILDDLY  DTHGTLEQLK  IFTEGVKRWD  --LS-LVDSL  P-DYIKITFE
```

FFLNTSNELI AE--VAKTQE RDMSAYIRKT WERYLE-----  
----- AYMQEAEWIT AG-HVP---T FDEYMKNGIS SSGMCILNLY SLLLMGQL--  
-LPDDVLEQI HSP---SKIH ELVELTARLV DDSKDFETNK -VG-GELASG IECYVKDNPE  
CTLEDASNHL NGLLDLTVKE LNWEFVRH-- -DSVAL--CF KKFAFNVARG LRLIY--KYR  
-DG-FDVSNO -EMKTHIFKI LIDPLT----- \*  
>P1;K6\_PINSY

Length = 775

-----  
----MAQISI GAPLSAEVNG ACINTHHHGN LWDDYFIQSL KSPYEAPE-- -C--HERCEK  
MIEEVKHLLE SEMRDGNDD- -----LIKRLQMVDFECL GIDRHFHHEI QAALDYVYRY  
WNELEGIGVG TRDSLTKDLY ATGLGFRALR LHRYNV--SS AV--LE-NFK NENGLFFHSS  
AVQEE----- --EVRCLMT LLRASEISFP GE--KVMDEA KAFATEYLNQ LLTR--VD-I  
TEVGENLLRE VRYAL-DFPW YCSVPRWEAR SFIE-IFGQN NSWLKSTMNK -----KVLE  
LAKLDFNLIQ SAHQRELQLL SRWWSQSDI- -EKQ-NFYRK RHVEFYFWMV I-GTFEPEFS  
SSRIAFAKIA TLMTILDDLY DTHGTLEQLK IFTEAVKRWD --LS-LQDRL P-DYIKITLE  
FFFNTSNELN AEV-AKMQER DMSAYIRKAG WERYIE-----  
----- GYMQESEWMA AR-HVP---T FDDYMKNKGR SSGMCILNLY SLLLMGQL--  
-VPDNILEQI HLP---SKIH ELVELTARLV DDSKDFQAKK -DG-GEFASG TECYLKEKPE  
CTEEDAMNHL IGLLNLTAME LNWEFVKH-- -DGVAL--CL KKFVFEVARG LRFIY--KYR  
-DG-FDYSNE -EMKSQITKI LIDQVPI--- \*  
>P1;K4\_PINSY

Length = 775

-----  
----- MAEICESVSV PRRTANYHGN VWDDDEFIVSL NSPYGAPA-- -Y--YERVGK  
LIEEIKHLLE SEMEDSNYDF IK-----R LRIVDTFECL GIDRHFQHEI KTVALDYVYR  
YWNEKGIAVG SRDFLNRLDN TTALGFRALR LHRYNV--DS GV--LE-NFK DGNGKFFCNF  
SGDK----- --EVRSMLE LLRASEISFP GE--KVMEEA KAYTREYLNQ VLAARG-E-V  
TGVDQSLREE VKYAL-EFPW HCSAPRWEAR SFIE-IYGEN HSWLKSNNFNQ -----KVLE  
LAKLDFNLIQ CIHQKEMQYI TRWWRDSEV- -AQV-NFYRR RHMELYFWAV I-SIFEPEFS  
QSRIAFAKVT TVGTVLDDLY DTYGMLDELK TITEGVRRWD --IS-LIDDL P-EKIKIAIQ  
FFFNTANELA AE--VVSQKQ POTSAILKDT WVRYLE-----  
----- SYLQEAEWIT TG-CVP---T FSEYIKNAVA SSGMCIVNLI PLLLMGQP--  
-LPNNILOQI HSP---SKIQ ELSELTIRLI DDLRDFEDEK -ER-GEMASI IECYIKDNPD  
STVGNALNRI KGILQLSLEE MNREFLQK-- -DSVPL--CC KKFTFNITRG LQFLY--KYG  
-DG-ISISNN -EVKDQIFKI LVEQVPMDE- \*  
>P1;J4\_PICSI

Length = 775

-----  
----- MAQISESAAI PRRTANHHGN VWDDDLILSL DSPYGAPA-- -Y--YERVAN

LIEEMKHL L REMEDSNHDL IR-----R LQIVDTLECL GIDRHFQHEI KTAALDYVYR  
CWNEKGIGMG SSSDSGSKDL ATALGLRALR LHRYNV--SS GV--LE-NFK DENGKFFCNL  
TGDK----- ---RVRSM L LRRASEISFP GE--KVMQEA KAFTREYLTO VLAGRGDV--  
TDVDQSLRE VKYAL-EFPW HWSVPRWEAR SFIE-IYGON HSWLKSNIQO -----KVLE  
LAKLDFNIO CIHQKEIQFI VRWWRESEI- -AQL-NFYRK RHVEFYFWVV I-CIFEPEFS  
QSRIAFKIC TVATVLDDLY DTHGMLDELK TVTEGVS RWD --LP-LIDDL P-DNIKIAFO  
FFNTANELA VE--VVKKQG RDMIAL LKAN WQRYVE---- -----  
----- SYLQEA EWIA TR-HVP----S FDEYIKNARA SSGMCIGNLI PLLLLGQL--  
-LANNIVEQI HSP---SKIQ ELSELTIRLI DDIRD FEDEK -ER-GEIASA IECYMKDNP  
STVENALNHL EGILHLSLEE LNWEFIKQ-- -DTVPL--CC KKFTFNIVRG LQFVY--KYG  
-DG-LSISNK -EVKDQIFKI LIDQVPIEE- -----\*  
>P1;02\_ABIGR

Length = 775

-----  
----- -MAEISESSI PRRTGNHHGN VWDDDLI HSL NSPYGAPA-- -Y--YELLQK  
LIQEIKHL L TEMEMDDGDH D-----LIK R LQIVDTLECL GIDRHFQHEI QTAALDYVYR  
WWNEKGIGEG SRDSFSKDLN ATALGFRALR LHRYNV--SS GV--LK-NFK DENGKFFCNF  
TGEEGRGDK- ---QVRSM L LRRASEISFP GE--KVMEEA KAFTREYLNQ VLAGHGDV--  
TDVDQSLRE VKYAL-EFPW HCSVPRWEAR SFLE-IYGHN HSWLKSNIQO -----KMLK  
LAKLDFNIO CKHHKEIQFI TRWWRDSGI- S-QL-NFYRK RHVEYYSWVV M-CIFEPEFS  
ESRIAFKTA ILCTVLDDLY DTHATLHEIK IMTEGVRRWD --LS-LTDDL P-DYIKIAFO  
FFNTVNELI VE--IVKRQG RDMTTIVKDC WKRYIE---- -----  
----- SYLQEA EWIA TG-HIP---T FNEYIKNGMA SSGMCILNLN PLLLLDKL--  
-LPDNILEQI HSP---SKIL DLLELTGRIA DDLKDFEDEK -ER-GEMASS LQCYMKENPE  
STVENALNHI KGILNRSLEE FNWEFMKQ-- -DSVPM--CC KKFTFNIGRG LQFIY--KYR  
-DG-LYISDK -EVKDQIFKI LVHQVPMEE- -----\*  
>P1;N7\_PICSI

Length = 775

MALVSIAPLV SRSGVQKSLI SSTNDLLSLC KPLSTIGMLR PKKYVTPITT SMSNAAQREA  
TNQHSNICGD DVTPSIGNDA ERRVANHHSN LWDDDV I HSL STSYEAPA-- -Y--RQRVET  
LIEDIKRLL L IEMEDSCSDS DDD---LIK R LQIVDTIECL GIDRHFQPEI KVAVDYVYRC  
WNERGIG-LG SRDSL I KDLN STALGFQALR MHRYNV--SS GV--FD-NFK DENGQFFCNS  
SGEEKEGRD DK-RVRSM L LFRASNISFP GE--KVMDEA KIFTTEYLNQ VLTG--QA-V  
TDVDQSLRE VKYAL-EFPW HCSVPRWEAR NYIE-IYEON YSWLKSNI NA -----KILE  
LAKLDFNIO CTHQKEMQLI SRWWADSYL- -POL-GFYRK RHVELYFWVV T-GTFEPEFS  
SSRIAFTKIA TLATVLDDLY DTHGTLDEVK IFTEGVRRWD --NS-LIGRL P-DHIKKIFE  
FFMKTSNEMN DEV-EKKQGR DMRAYIRKNG WERYLE---- -----  
----- SYLQEA EWIA AG-YVP----S FNEYLKNGLA SSGSCVLNLI PLLLLMQI--  
-LPEDILEQI FFP---SKIH ELLEMTIRLK DDITDFEQEK -ER-GEIASS LECYLKDNPE

STREDALNHI KGILDLSVSE LNWEFLKH-- -DNVPL--CC KKFTFNFARG MHFLF--KYK  
-DG-VSISDN -EVKDQILKV LIEPVHL--- -----\*  
>P1;K5\_PINSY

Length = 775

-----MAL VSVTPLISRS GVHRLPISSK NDRSALCQQL  
SSAGMVMPKK SVTPILSMST QRRGTGNHHSN VWDDDDVIHSL STSYAAPT-- -Y--RERGET  
LVEDIKHRLN NDMKDCSDA ADD---LIRR LQMVDIEECL GIDRHFQPEI KEAIDYVYRY  
WNETGIG-LG SRNSGIKDLN ATALGFRALR MHRYNV--SS DV--LE-NFK DESGQFFCSS  
STGEE---GN ADKEVRSMLS LFRASNISFP GE--KVMEEA KFTFTQYLTQ VLTG--HT-A  
ADVDQSLQRE VKYAL-EFPW HCSVPRWEAR NFIE-IYEON YSWLKSIMNQ -----KILE  
LAKLDFNILQ CTHKEEMQLI SRWRSESYL- -PQL-DFYRK RHVELYFWAV L-GTFEPEFR  
SSRIAFTKLS TVMTVIDDLY DTHGTLDEIK IFTEGVRRWD --TS-LISRL P-DHIQKIFE  
FFMKTSNEWT AEV-EKKQGR DMAAYIRKNG WERYVE---- -----  
-----SYLQEGEWMA AG-YVP---S FNEYKNGLA SSGMVCVNLNLI PLLLLMDQI--  
-LPDDILKQI VYP---SKIH ELLELTIRVK DDITDFEKEK -EH-GQVASC SECYMKDNPE  
CTREDALNHM KGILDLSVSQ LNWEFLKH-- -DNVPL--CY KRFTFNLARG MHFLF--KYN  
-DG-ITLSDN -EVKDQIFKV LIQPLQL--- -----\*  
>P1;G8\_ABIGR

Length = 775

-----MAQISES VSPST----- -----DLKS TESSIT-----  
-----S NRHG----- -----NM WEDDR-IQSL NSPYGAPA-- -Y--QERSEK  
LIEEIKLLFL SDMDSCNDS DRD---LIK R LEIVDTVECL GIDRHFQPEI KLALDYVYRC  
WNERGIGEG- SRDLSLKKDLN ATALGFRALR LHRYNV--SS GV--LE-NFR DDNGQFFCGS  
TVEEEGAE-A YNKHVRCMLS LSRASNILFP GE--KVMEEA KAFTTNYLKK VLAGREA---  
THVDESLIGE VKYAL-EFPW HCSVQRWEAR SFIE-IFGQI DSELKSNLSK -----KMLE  
LAKLDFNILQ CTHQKELQII SRWFADSSI- A-SL-NFYRK CYVEFYFWMA A-AISEPEFS  
GSRVAFTKIA ILMTMLDDLY DTHGTLDDQLK IFTEGVRRWD --VS-LVEGL P-DFMKIAFE  
FWLKTSNELI AEA-VKAQGO DMAAYIRKNA WERYLE---- -----  
-----AYLQDAEWIA TG-HVP---T FDEYLNNGTP NTGMVCVNLNLI PLLLLMGEH--  
-LPIDILEQI FLP---SRFH HLIELASRLV DDARDFQAEK -DH--GDLSC IECYLKDHPE  
STVEDALNHV NGLLGNCLLE MNWKFLKKQ- -DSVPL--SCK KYSFHVLSARS IQFMY--NQG  
-DG-FSISNK -VIKDQVQKV LIVPVPI--- -----\*  
>P1;S2\_PINTA

Length = 775

-----  
-----MSSLAVDDA ERRVGDYHPN LWDDALIQLS STPYGASP-- ---YRDVAEK  
LIGEIKEMFA SISIEDGDDE ICY---FLQR LWDMIDNVERL GISRHFENEI KAAMEDVYSR  
HWSDKG-IAC GRHSVVADLN STALAFRTL R LHGYSV--CS DV--FK-IFQ DQKGEFACSA  
DQTEG----- ---EIKGILN LLRASLIAFP GE--RILQEA EIFATTYLKE ALP-----

KIQGSRLSQE IEYVL-EYGW LTDLPRLETR NYIEVLAE EI TPYFKKP--- -CMAVEKLLK  
LAKIEFNLFH SLOQTELKHL SRWWKDSGF- -AQL-TFTRH RHVEFYTLAS C-IAMEPKHS  
AFRLGFAKLC YLGIVLDDIY DTYGKMEELE LFTA AIKRWD --TS-TTECL P-EYMKG VYM  
AFYDCVNEMA RQ--AEKTQG WDTLDYARKT WEALID---- -  
----- AFMEEAKWIS SG-YVP---T FOKYLDNGKV SFGYRAATLQ PILTLDIP--  
-LPLHILQEI DFP---SSFN DLASSILRLR GDICGYQAER -SR-GEQASS ISCYMKDNPG  
STEEDALSHV NAMIGDKIPE FNWEFMKP-- -SKAPIS--S KKYAFDILRA FYHLY--KYR  
-DG-FSIAKI -ETKKLVMRT VLDPVPM--- -  
-----\*

>P1;VM\_PICAB

Length = 775

-----  
----MDLAVE IAMDLAVDDV ERRVGDYHSN LWDDDFIQSL STPYGASS-- ---YRERAER  
LVGEVKEMFT SISIEDGELT SD----LLQR LWMVDNVERL GISRHFENEI KAAIDYVYSY  
WSDKGIVR-- GRDSAVPDLN SIALGFRTL R LHGYTV--SS DV--FK-VFQ DRKGEFACSA  
IPTEG----- ---DIKGVLN LLRASYIAFP GE--KVMEKA QTFAATYLKE ALQK-----  
-IQVSSLSRE IEYVL-EYGW LTNFPRLEAR NYIDVFGEEI CPYFKKP--- -CIMVDKLE  
LAKLEFNLFH SLOQTELKHV SRWWKDSGF- -SQL-TFTRH RHVEFYTLAS C-IAIEPKHS  
AFRLGFAKVC YLGIVLDDIY DTFGKMELE LFTA AIKRWD --PS-TTECL P-EYMKG VYM  
AFYNCVNELA LQ--AEKTQG RDMLNYARKA WEALFD---- -  
----- AFLEEAKWIS SG-YLP---T FEEYLENGKV SFGYRAATLQ PILTLDIP--  
-LPLHILQOI DFP---SRFN DLASSILRLR GDICGYQAER -SR-GEEASS ISCYMKDNPG  
STEEDALSHI NAMISDNINE LNWELLKP-- --NSNVPIS KKHAFDILRA FYHLY--KYR  
-DG-FSIAKI -ETKNLVMRT VLEPVP--- -  
-----\*

>P1;VW\_MAIZE

Length = 775

-----  
--MAMPVKLT PASLSLKAVC CRFSSGGHAL RFGSSLPCWR RTPTQRSTSS -STTRPAAEV  
SSGKSKQHDQ EASEATIR-- -----QQ LQLVDVLENM GISRHFAAEI KCILDRTYRS  
WLQ----- RHEEIMLDTM TCAMAFRILR LNGYNV--SS DE--LYHVVE ASGLHNSLGG  
YLN----- ---DTRTLE LHKASTVSIS EDE-SILDSI GRSRSTLLRE QLESGG----  
ALRKPSLFKE VEHAL-DGPF YTTLDRLHHR WNIENFNIE QHMLET PYLS NQHTSRDILA  
LSIRDFSSSQ FTYQOELQHL ESWVKECRL- -DQL-QFARQ KLAYFYLSAA G-TMFSPELS  
DARTLWAKNG VLTIVDDFF DVAGSKEELE NLVMLVEMWD -EHH-KVEFY S-EQVEIIFS  
SIYDSVNQLG EK--ASLVQD RSITKHLVEI WDLK---- -  
----- SMMTEVEWRL SK-YVP---T EKEYMINASL IFGLGPIVLP ALYFVGPK--  
-ISESIVKDP EYD----ELF KLMSTCGRLL NDVQTFEREY -NE--GKLNS VSLLVLHGGP  
MSISDAKRKL QKPIDTCRRD LLSLVLREE- -SVVPR--PC KELFWKMCKV CYFFY--STT  
-DG-FSSQVE --RAKEVDAV INEPLKLOGS HTLVSDV--- -  
-----\*

>P1;0J\_OCIBA

Length = 775

```
-----  
-----ME SRRSANYQAS IWDDNFIQSL ASPYAGEK-- ---YAEKAEK  
LKTEVKTMID QTRDELK--- -----Q LELIDNLQRL GICHHFQDLT KKILQKIYGE  
ERNGD----- HQHYKEKGLH FTALRFRILR QDGYHV--PQ DV--FS-SFM NKAGDFEESL  
SK----- ---DTKGLVS LYEASYSME GE--TILDMA KDFSSHHLHK MVED-----  
-ATDKRVANQ I IHSL-EMPL HRRVQKLEAI WFIQ-FYECG SDANPT---- -----LVE  
LAKLDFNMVQ ATYQEELKRL SRWYEETGL- QEKL-SFARH RLAEAFWLSM G-IIPEGHFG  
YGRMHLMKIG AYITLLDDIY DVYGTLEELQ VLTEI IERWD --IN-LLDQL P-EYMQIFFL  
YMFNSTNELA YE--ILRDQG INVISNLKGL WVELSQ---- -----  
----- CYFKEATWPH NG-YTP---T TEEYLNVAI SASGPVILFS GYFTTTNP--  
-INKHELQSL ERH-----A HSLSMILRLA DDLGTSSDEM -KR-GDVPKA IQCFMNDTGC  
-CEEEARQHV KRLIDA EWKK MNKDILMEKP FKNFCP---- --TAMNLGRI SMSFY--EHG  
-DG-YGGPHS -DTKMKMVS L FVQPMNITI- -----*  
>P1;FT_LAVAN
```

Length = 775

```
-----  
-----ME ARRSGNFESS IWDDDYIQSL TSSYTGKMY- ----VDKSEK  
LKIEVKMMMD EATDELE--- -----Q LELINDLQRL GISYHFKDGI AKMLNNIYKS  
----- DSKYMEKDLH LTALKFRLLR QHGYRV--PQ DV--FS-SFM DDEGNFEAWV  
VE----- ---DVSVLVS LYEASHISVE GE--SILDMA KDFSSHHLTE MVEQIG----  
---EACLAEQ VKRTL-ELPL HWRVGRLEAR WVFVQ-AYETR PNSNPT---- -----LVE  
LAKLDFNMVQ AKYQDELKRC SRWYEETGL- PEKM-SFARH RLAE CFLWLSL G-FIPDPHGG  
YSREIMTKIA VLITITDDIY DIYGALEELQ EFTEAFERWD --IN-SLDLL P-EYMQICFL  
AIFNSANELG YQ--ILRDQG LNIIPNLKRS WAELSR---- -----  
----- AYYLEARWPH NG-FVP---T TDQYLNTAWI SISGPLLLSY GYLTTTNP--  
-INNKEKSL EKH---PSII RWPSMVLRLA DDLGTSSEEI -KR-GDVSKS IQCYMNETGC  
-CEGDARHHV KSLIEVALKR MNDEILMEKP FKSFDT---- --NAMNLARI SLCFY--QYG  
-DG-FGKPHS DTIKNLVSLI VLPFHMP--- -----*  
>P1;P5_ANTMA
```

Length = 775

```
-----  
-----MSNLHVKK  
TDRIASGFDV AYLSAANKTH QWSIADDIAS TPGSPRLHYP MDFNGQSTRT PDNFSMEYDK  
KIEEIKNLLR SKREEEPID- -----R LMFVDALQRL GVNHNFEELI ETILRNYYES  
TS----- ANICGFHTLH DVSLFFRLMR QHGYDI--SS DV--FN-KFK GDDGRFRGEL  
QR----- ---DTRGLME LYEASQLRFE GE--YTLDEA ESFSSQNLNK YLAD-----  
--MDCSSCRL VTNKL-QHPY RKSIGRLTTR YDFR----GK NQWGKT---- -----LHE  
LAAMDLMRK SEYQKELFQV SEWWKELRI- AENL-SLARN QPLKWTCSM AILIDDITLS  
EQRIELTKSI TFIYLIDDIF DVYGSPEELV IFAEAVSKWD --YA-AVETL P-DYMKLCYK
```

SLLD'TTNEIG YK--IYEKYG YNPIDSLKTT WASLCN-----  
----- AFLEEAKWFA SG-NLP---N ATKYLENGKV SSGVYVVMVH LFFLLGLG--  
-GTCGSAIHL NDT---SKLM SSVATILRLW DDLGSAKDEH -QD-GKDGSY IECYMKEHIS  
LSTEQAOQHA IDLISSEWKL LNKECFNLN- -HVSTS--SI KKAALNTARM VPLMY----S  
YD---ENQGL PILEEYVKIM LFD----- \*  
>P1;XV\_MEDTR

Length = 775

-----  
MAFSLSFATS TKHSTFSSNK TSNILEYNKT NLTSVFNQIH IPKSGKCK-- -DDLHIRHAK  
ALDEVKQV FV RNIRKNTD-- -----EC LSMVDSIQRL GMEYNFEEEI EATLERKHTM  
LRFQ----- FORNEYQGLS QAAFQFRMLR QEGYYI--SP DI--FD-KFC DNKGKLYTF  
SE----- ---DINGMIA LFEASQLSIE GE--DCLDNV GQFCGQYLND WSS-----  
TFHGHPQAKF VAHTL-MYPT HKTLRFTPT IMQS----QN ATWTNS---- -IQQ  
FSKIDTQMV SSSLKEIFAV SKWWKDLGL- PKDL-EFARD EPIKWYSWSM A-CLPDPQFS  
EERIELTKPL SLIYIIDDIF DFYGNIDELT LFTDAVKRWD --LS-AIEQL P-DCMKVCFK  
ALYDITNEFA LR--TYIKHG WNPLTSLIKS WVRLLN---- -  
----- AFLQEAKWFA SG-NVP---K SEEYLKNAIV STGVHVILVH AFFCMGQG--  
-ITEKTVSLM DDF---PTII STTAKILRLC DDLEGDKDVN -CE-GNDGSY SKCYMKDNPG  
VSIGLTKEHM SEQISDAWKQ LNKECLNT-- -NPLPS--SF TKLCLNAARM VPIMYN-YDG  
-NT-PSKLEE YVKSLNDGG YLQSIHSPTS EHSTV----- \*  
>P1;AZ\_MALDO

Length = 775

-----M EFRVHLQADN  
EQKIFQNMK PEPEASYLIN QRRSANYKPN IWKNDFLDQS LISKYDGD-- --EYRKLSEK  
LIEEVKIYIS AETMDLVA-- -----K LELIDSVRKL GLANLFEKEI KEALDSIAAI  
ES----- DNLGTRDDLY GTALHFKILR QHGKVV--SQ DI--FG-RFM DEKGTLENHH  
FA----- ---HLKGMLE LFEASNLGFE GE--DILDEA KASLTLALRD SG-----HI  
CYPDSNLSRD VVHSL-ELPS HRRVQWFDVK WQIN-AYEKD ICRVNAT--- -----LLE  
LAKLNFNVVQ AOLQKNLREA SRWWANLGI- ADNL-KFARD RLVECFACAV G-VAFEPEHS  
SFRICLTQVI NLVLIIDDVY DIYGSEELK HFTNAVDRWD --SR-ETEQL P-ECMKMCFQ  
VLYNTTCEIA REI-EEENGW NQVLPQLTKV WADFC-----  
----- ALLVEAEWYN KS-HIP---T LEEYLRNGCI SSSVSVLLVH SFFSITHE--  
-GTKEMADFL HKN---EDLL YNISLIVRLN NDLGTSAAEQ -ER-GDSPSS IVCYMREVNA  
-SEETARKNI KGMIDNAWKK VNGKCF-- -NOVPFLSSF MNNATNMARV AHSLY--KDG  
-DG-FGDQEK -GPRTHILSL LFQPLVN--- - \*  
>P1;EC\_SOLTU

Length = 775

-----  
---MALAAA VMSNYGEEI VRPVADFSPS LWGDRFHYFS LDNQVEKE-- -Y--AQEIET



LKEQTRSMML AASGMTLA-- -----EK LNLIDIVERL GLAYHFEEKOI EDMLDQIYKA  
HPN----- FESHEYSDLT TLSVQFRLLR OHGYNI--SP KI--FS-RYQ DAKGKFNEPL  
SN----- ---DIKGLLN LYEASHVRTH GE--DILEEA LAFSTAHLES AA-----  
PHLKSPLSKQ VTHAL-EQSL HKSIPRVETR YFIS-IYEEE EHKNDV---- -----LLR  
FAKLDFNLLQ MLHKQELSEV SRWWKDLDF- VTTL-PYARD RAVECYFWTM G-VYAEPQYS  
QARVMLAKTI AMISIVDDTF DAYGIVKELE VYTDAIQRWD --IS-QIDRL P-DYMKISYK  
ALLDLYNDYE TE--LSMDGR SDVVHYAKER MKEIVR---- -----  
----- NYFVEAKWFI EG-YMP---P VSEYLSNALA TSTYYLLTTT SYLGVKS---  
-ANKEDFEWL AKN---PKIL EANVTLCRVI DDIATYEVEK -GR-GQIATG IECYMRDYGV  
-STEVAMEKF QEMAEIAWKD VNEGILRP-- -TPIST--EI LTRILNLARI IDVTY-KHNQ  
-DG-YTHPEK -VLKPHIIAL LVDSIEI--- -----\*  
>P1;6I\_SOLTU

Length = 775

-----  
----MALAAA VMSNYGEEEI VRPVADFSPS LWGDRFHYFS LDNOVAKE-- -Y--AQEIET  
LKEQTRSMML AASGMTLA-- -----EK LNLIDIVERL GLAYHFDKQI EDMLDQIYKA  
HPN----- FESHEYSDLT TLSLQFRLLR OHGYNI--SP NRF-FS-RYQ DAKGKFNEPL  
SN----- ---DIKGLLN LYEASHVRTH GE--DILEEA LAFSTAHLES AA-----  
PHLKSPLSKQ VTHSL-EQSL HKSIPRVETR YFIS-IYEQE EFKNDV---- -----LLR  
FAKLDFNLLQ MLHKQELSEV SRWWKDLDF- VTTL-PYARD RAVECYFWTM G-VYAEPQYS  
QARVMLAKTI AMISIVDDTF DAYGIVKELE VYTDAIQRWD --IS-QIDRL P-DYMKISYK  
ALLDLYHDYE TE--LSKDGR SDVVHYAKER MKEIVR---- -----

----- NYFVEAKWFI EG-YMP---P VSEYLSNALA TSTYYLLTTT SYLGVKS---  
-ANKEDFEWL AKN---PKIL EANVTLCRVI DDIATYEVEK -GR-GQIATG IECYMRDYGV  
-STEVAMEKF QDMAEIAWKD VNEGILGP-- -TPIST--EI LTRILNLARI IDVTY-KHNQ  
-DG-YTHPEK -VLKPHIIAL LVDSIEI--- -----\*

>P1;H6\_SOLTU

Length = 775

-----  
-----MSNYGEEEI VRPVADFSPS LWGDRFHYFS LDNOVAKE-- -Y--AQEIET  
LKEQTRSMML TASGMTLA-- -----EK LNLIDIVERL GLAYHFEEKOI EDMLDQIYKA  
HPN----- FDSHEYSDLT TLSLQFRLLR OHGYNI--SP KI--FS-RYQ DAKGKFNEPL  
SN----- ---DIKGLLN LYEASHVRTH GE--DILEEA LAFSTAHLES AA-----  
PHLKSPLSKQ VTHAL-EQSL HKSIPRVETR YFIS-IYEEE EFKNDV---- -----LLR  
FAKLDFNLLQ MLHKQELSEV SRWWKDLDF- VTTL-PYARD RAVECYFWTM G-VYAEPQYS  
QARVMLAKTI AMISIVDDTF DAYGIVKELE VYTDAIQRWD --IS-QIDRL P-DYMKISYK  
ALLDLYNDYE TE--LSKDGR SDVVHYAKER MKEIVR---- -----  
----- NYFVEAKWFI EG-YMP---P VSEYLSNALA TSTYYLLTTT SYLGVKS---

-ANKEDFEWL AKN---PKIL EANVTLCRVI DDIATYEVEK -GR-GQIATG IECYMRDYGV  
-STEVAMEKF QEMAEIAWKD VNEGILRP-- -TPVST--EI LTRILNLARI IDVTY-KHNQ  
-DG-YTHPEK -VLKPHIIAL LADSIEI--- -----\*  
>P1;1W\_SOLTU

Length = 775

-----  
----MTPAAV VMSNYGEEEI VRPIADFSFS LWGDRFHSFS LDNQIAGK-- -Y--AQEIET  
LKEQSRIILS ASSRRTLA-- -----EK LDLIDIVERL GIAYHFEEKI DDMLDQFYKA  
DPN----- FEAHEYNDLQ TLSVQFRLLR QHGYNI--SP KL--FI-RFQ DAKGKFESL  
CN----- ---DIKGLLN LYEASHVRTH GE--DILEEA LAFSTAHLES AA-----  
PHLKSPLSKQ VTHAL-EQSL HKSIPRVETR YFIS-IYEEE EQKNDV---- -----LLQ  
FAKLDFNLLQ MLHKQELSEV SRWWKDLDF- VTTL-PYARD RAVECYFWM G-VYAEPQYS  
QARVMLAKTI AMISIVDDTF DAYGIVKELE IYTDAIQRWD --IS-QIDRL P-DYMKISYK  
ALLDLYNDYE ME--LSKDGR SDVVHYAKER MKEIVR---- -----  
----- NYFVEAKWFI EG-YMP---P VSEYLSNALA TSTYYLLTTT SYLGMKS---  
-ANKQDFEWL AKN---PKIL EANVTLCRVI DDIATYEVEK -GR-GQIATG IECYMRDYGV  
-STEKAMEKF QEMAETAWKD VNEGILRP-- -TPVST--EI LTRILNLARI IDVTY-KHNQ  
-DG-YTHPEK -VLKPHIIAL LVDSIEI--- -----\*  
>P1;U3\_SOLTU

Length = 775

-----  
-----MNNYQEEDI VRPVADFSFS LWGDRFHSFS LDNQIAGK-- -Y--AQEIDT  
LKEQSRLILF ASYIRTLA-- -----EK LDLIDIVERL GIAYHFEEKI DDMLDQIYKA  
DPN----- FEAHEYNDLQ TLSVQFRLLR QHGYNI--SP KL--FS-RFQ DAKGKFNESL  
SN----- ---DIKGLLN LYEASHVRTH GE--DILEEA LAFSTAHLES AA-----  
PHLKSPLSKQ VTHAL-DQSL HKSIPRVETR YFIS-IYEEE EHKNDV---- -----LLR  
FAKLDFNLLQ MLHKQELSEV SRWWKDLDF- VTTL-PYARD RAVECYFWM G-VYAEPQYS  
QARVMLAKTI AMISIVDDTF DAYGIVKELE IYTDAIQRWD --IS-QIDRL P-DYMKISYK  
ALLDLYNDYE ME--LSKDGR SDVVHYAKER MKEIVR---- -----  
----- NYFVEAKWFI EG-YMP---P VSEYLSNALA TSTYYLLTTT SYLGMKS---  
-ANKQDFEWL AKN---PKIL EANVTLCRVI DDIATYEVEK -GR-GQIATG IECYMRDYGV  
-STEKAMEKF QEMAETAWKD VNEGILRP-- -TPVST--EI LTRILNLARI IDVTY-KHNQ  
-DG-YTHPEK -VLKPHIIAL LVDSIEI--- -----\*  
>P1;67\_SOLLC

Length = 775

-----  
----MASAAA LVSNYREEEI VRPVADFSFS LWGDRFHSFS LDNKIAGK-- -Y--AQEIET  
LKEQSRVILS ASSGTTLAQ-- -----K LDLIDIVERL GLAYHFEEKI DDVLDQIYKA  
DPN----- SEAQEYNDLQ TSSIQFRLLR QHGYNI--SP KL--FS-RFQ DAKGKFNESL

SN----- ---DIKGLLN LYEASHVRTH GE--DILEEA LAFSTAHLES AA-----

PHLKSPLSKQ VTHAL-EQSL HKSIPRVETR YFIS-IYEEE EQKNDL---- -----LLR  
FAKLDFNLLQ MLHKQELSEV SRWWKDLDF- VTTL-PYARD RAVECYFWTM G-VYAEPQYS  
QARVMLAKTI AMISIVDDTF DAYGIVKELE VYTDAIQRWD --IS-HIDRL P-DYMKISYK  
ALLDLYDDYE TE--LSKDGR SDVVHYAKER MKEIVR---- -----  
----- NYFVEAKWFI EG-YMP---P VSEYLCNALA TSTYYLLTTT SYLGVKS---  
-ANKEDFEWL AKN---PKIL EANVTLCRVI DDIATYDVEK -GR-GQIATG IECYMRDYG  
-STEEAMEKF EEMAEIAWKD VNEGILRP-- -TPVST--EI LTRILNLARI IDVTY-KHNQ  
-DG-YRHPEK -VLKPHIAL LVDSIEI--- -----\*

>P1;7B\_SOLTU

Length = 775

-----  
-----MAL AIPFNNEEEI VRPVANFSPS LWGDRFHSFS LDNOVAEK-- ---YAQEIET  
LKEQTRSLLS AAACGITLA- -----EK LNLIDIVERL GLAYHFEEKI DDMLDQIYKA  
----- DPNFDAHDLN TLSLQFRILR OHGYNI--SQ KF--FS-RFQ DANGKFKECL  
SN----- ---DIRGLLN LYEASHVRTH GE--DILEEA LVFSTAHLES AA-----  
PHLESPLSKQ VTHAL-EQSL HKSIPRVETR YFIS-IYEEE EFKNDV---- -----LLR  
FAKLDYNLLQ MLHKHELSEV SRWWKDLDF- VTTL-PYARD RAVECYFWTM G-VYAEPQYS  
QARVILAKTI AMISIVDDTF DAYGIVKELE VYTDAIQRWD --IS-QIDRL P-EYMKVSFK  
ALLDLYEDYE KE--LSKDGR SDVVHYAKER MKEIVR---- -----  
----- NYFVEAKWFI EG-YMP---P VSEYLSNALA TSTYYLLTTT SYLGVKS---  
-ATKEDFEWL ATN---PKIL EANVTLCRVV DDIATYEVEK -GR-GQIATG IECYMRDYDV  
-STEVAMEKF QEMAEIAWKD VNEGILRP-- -TPVST--EI LTRILNLARI IDVTY-KHNQ  
-DG-YTHPEK -VLKPHIAL LVDSIEI--- -----\*

>P1;A2\_SOLTU

Length = 775

-----  
-----MAL AIPFNNEEEI VRPVANFSPS LWGDRFHSFS LDNOVAEK-- -Y--AQEIET  
LKEQTRSLLS AAACGITLA- -----EK LNLIDIVERL GLAYHFEEKI DDMLDQIYKA  
----- DPNFDGHDLN TLSLQFRILR OHGYNI--SQ KF--FS-RFQ DANGFK-ECL  
SN----- ---DIRGLLN LYEASHVRTH GE--DILEEA LVFSTAHLES AA-----  
PHLESPLSKQ VTHAL-EQSL HKSIPRVETR YFIS-IYEEE EFKNDV---- -----LLR  
FAKLDYNLLQ MLHKHELSEV SRWWKDLDF- VTTL-PYARD RAVECYFWTM G-VYAEPQYS  
QARVILAKTI AMISIVDDTF DAYGIVKELE VYTDAIQRWD --IS-QIDRL P-EYMKVSFK  
ALLDLYEDYE KE--LSKDGR SDVVHYAKER MKEIVR---- -----  
----- NYFVEAKWFI EG-YMP---P VSEYLSNALA TSTYYLLTTT SYLGVKS---  
-ATKEDFEWL ATN---PKIL EANVTLCRVV DDIATYEVEK -GR-GQIATG IECYMRDYDV  
-STEVAMEKF QEMAEIAWKD VNEGILRP-- -TPVST--EI LTRILNLARI IDVTY-KHNQ

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-DG-YTHPEK -VLKPHIIAL LVDSIEI--- -----*
>P1;F6_SOLTU
  Length = 775
-----
-----MAL AIPFNNEEEI VRPVANFSPS LWGDRFHSFS LDNOVAEK-- -Y--AQEIET
LKEQTRSLLS AAACGITLA- -----EK LNLIDIVERL GLAYHFEEKI DDMLDQIYKA
----- DPNFDAHDLN TLSLQFRILR OHGYNI--SQ KF--FS-RFQ DANGKFKECL
SN----- ---DIRGLLN LYEASHVRTH GE--DILEEA LVFSTAHLES AA-----
PHLESPLSKQ VTHAL-EQSL HKSIPRVETR YFIS-IYEEE EFKNDV---- -----LLR
FAKLDYNLLQ MLHKHELSEV SRWWKDLDF- VTTL-PYARD RAVECYFWTM G-VYAEPOYS
QARVILAKTI AMISIVDDTF DAYGIVKELE VYTDAIQRWD --IS-QIDRL P-EYMKVSFK
ALLDLYEDYE KE--LSKDGR SDVVHYAKER MKEIVR---- -----
----- NYFVEAKWFI EG-YMP---P VSEYLSNALA TSTYYLLTTT SYLGVKS---
-ATKEDFEWL ATN---PKIL EANVTLCRVV DDIATYEVEK -GR-GQIATG IECYMRDYDV
-STEVA MEKF QEMAEIAWKD VNEGILRP-- -TPVST--EI LTRILNLARI IDVTY-KHNQ
-DG-YTHPEK -VLKPHIIAL LVDSIEI--- -----*
>P1;VX_CAPAN
  Length = 775
-----

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```

-----MAL ATPLNNEKEI VRPVANFSPS LWGDRFHSFS LDNOVVEK-- -Y--GQEIET
LKEQTRSMLS AACGKTLV-- -----EK LNLIDIVERL GLAYHFEEKI ENMLDPIYKA
DPK----- FEAHDYNDLN TMSIPFRLLR OHGYNI--SP KI--FS-RFP KCKGKFKESEI
SN----- ---DMRGLLN LYEASHVRTH GE--DILEEA LAFSTAHLES AA-----
PHLKSPLNKQ VTHAL-EP SL HKSIPRVETR YFIS-IYEEE EFKNDV---- -----LLR
FAKLDHNLQ MLHKQKLSEV SGWWKDLDF- VTTL-PYARH RAVECYFWTM G-VYAEPOYS
QARVMLAKTI PMISIVDDTY DAYGIVNELE VYTDAIQRWD --IS-QIDRL P-EYMKISYK
ALLDLYDDYE KE--LSKDGR ADVVHYAKER MKEIVR---- -----
----- NYFVEAKWFI EG-HMP---P VSEYLSNALA TSTYYLLTTT SYLGMKC---
-ATKEDFEWL ATN---PKIL EANVTLCRVV DDIATYEVEK -DR-GQIATG VECYMRDYDV
-STEVA MEKF QEMAEIAWKD VNEGILRP-- -TPVST--GI LTRILNLARI IDVTY-KHNQ
-DG-YTHPEK -VLKPHIIAL LVDSIDI--- -----*
>P1;DU_HYOMU
  Length = 775
-----

```

```

-----V DN QVAEKY---- -----AQEIET
LKEQTSTMLS AACGTTLT-- -----EK LNLIDIERL GIAYHFEEKI EDMLDHIYRA
DPY----- FEAHEYNDLN TSSVQFRLLR OHGYNV--SP NI--FS-RFQ DANGKFKESL
RS----- ---DIRGLLN LYEASHVRTH KE--DILEEA LVFSVGHLES AA-----

```

PHLKSPLSKQ VTHAL-EQSL HKSIPRVEIR YFIS-IYEEE EFKNDL---- -----LLR  
FAKLDYNLLQ MLHKHELSEV SRWWKDLDF- VTTL-PYARD RAVECYFWTM G-VYAEPQYS  
QARVMLAKTI AMISIVDDTF DAYGIVKELE VYTDAIQRWD --IS-QIDRL P-EYMKISYK  
ALLDLYDDYE KE--LSKDGR SDVVHYAKER MKEIVG---- -----  
----- NYFIEGKWF I EG-YMP---S VSEYLSNALA TSTYYLLTTT SYLGMKS---  
-ATKEHFEWL ATN---PKIL EANATLCRVV DDIATYEVEK -GR-GQIATG IECYMRDYG  
-STEVAMEKF QEMADIAWKD VNEEILRP-- -TPVSS--EI LTRILNLARI IDVTY-KHNQ  
-DG-YTHPEK -VLKPHI IAL VVDSIDI--- -----\*

>P1;5EAT

Length = 775

-----  
-----MAS AAVANYEEI VRPVADFS LWDGQFLSFS IDNQVAEK-- ---YAQEIEA  
LKEQTRMMLL ATGRKLAD-- -----T LNLIDIERL GISYHFEKEI DEILDQIY--  
----- NQNSNCNDLC TSALQFRLR QHGFNI--SP EI--FS-KFQ DENGKFESL  
AS----- ---DVLGLLN LYEASHVRTH AD--DILEDA LAFSTIHLES AAP-----  
-HLKSPLREQ VTHAL-EQCL HGVPRVETR FFISSYDKE QSKNNV---- -----LLR  
FAKLDYNLLQ MLHKQELAQV SRWWKDLDF- VTTL-PYARD RVVECYFWAL G-VYFEPQYS  
QARVMLVKT I SMISIVDDTF DAYGTVKELE AYTDAIQRWD --IN-EIDRL P-DYMKISYK  
AILDLYKDYE KE--LSSAGR SHIVCHAIER MKEVVR---- -----  
----- NYNVESTWFI EG-YTP---P VSEYLSNALA TTTYYYLATT SYLGMKS---  
-ATEQDFEWL SKN---PKIL EASVIICRVI DDTATYEVEK -SR-GQIATG IECCMRDYG  
-STKEAMAKF QNMAETAWKD INEGLLRP-- -TPVST--EF LTPILNLARI VEVTY-IHNL  
-DG-YTHPEE -VLKPHI IINL LVDSIKI--- -----\*

>P1;LJ\_TOBAC

Length = 775

-----  
-----MAS AAVANYEEI VRPVADFS LWDGQFLSFS IKNQVAEK-- -Y--AKEIEA  
LKEQTRMMLL ATGMKLAD-- -----T LNLIDTIERL GISYHFEKEI DDILDQIY--  
----- NQNSNCNDLC TSALQFRLR QHGFNI--SP EI--FS-KFQ DENGKFESL  
AS----- ---DVLGLLN LYEASHVRTH AD--DILEDA LAFSTIHLES AA-----  
PHLKSPLREQ VTHAL-EQCL HGVPRVETR FFISSYDKE QSKNNV---- -----LLR  
FAKLDYNLLQ MLHKQELAQV SRWWKDLDF- VTTL-PYARD RVVECYFWAL G-VYFEPQYS  
QARVMLVKT I SMISIVDDTF DAYGTVKELE AYTDAIQRWD --IN-EIDRL P-DYMKISYK  
AILDLYKDYE KE--LSSAGR SHIVCHAIER MKEVVR---- -----  
----- NYNVESTWFI EG-YTP---P VSEYLSNALA TTTYYYLATT SYLGMKS---  
-ATEQDFEWL SKN---PKIL EASVIICRVI DDTATYEVEK -SR-GQIATG IECCMRDYG  
-STKEAMAKF QNMAETAWKD INEGLLRP-- -TPVST--EF LTPILNLARI VEVTY-IHNL  
-DG-YTHPEK -VLKPHI IINL LVDSIKI--- -----\*

>P1;PE\_9SOLA

Length = 775

```
-----MAS AAVGNYYYYE I VRPVADFSPS LWGDHFLSFS IDNOVAEK-- -Y--AQEIEP
LKEQTRSMML ATGRKLAD-- -----T LNLIDTIERL GISYFFEKEI DEILDHIY--
----- NQNSNCNDFC TSALQFRLLR OHGFNI--SP QI--FS-KFQ DENGKFRESL
AS----- --DVLGLLN LYEASHVRTH AD--DILED A LAFSTIHLES AA-----
PHLKSPLREQ VTHAL-EQCL HKGVPRVETR FFISSIEYE QSKNNV---- -----LLR
FAKLDFNLLQ MLHKQELA EV SRWWKDLDF- VTTL-PYARD RVVECYFWAL G-VYFEPQYS
QARVMLVKTI SMISIVDDTF DAYGTVKELE AYTDAIQRWD --IN-EIDRL P-HYMKISYK
AILDLYKDYE KE--LSSAEK SHIVCHAIER MKEVVG---- -----
----- HYNVESTWFI EG-YMP---P VSEYLSNALA TTTYYYLATT SYLGMKS---
-ATEQDFEWL SKN---PKIL EASVIICRVI DDTATYEVEK -SR-GQIATG IECCMRDYGI
-STKKAMAKF QKMAETAWKD INEGLLRP-- -TPVST--EF LTLILNLARI VEVTY-IHNL
-DG-YTHPEK -VLKPHIINL LVDSIKI--- -----*
```

>P1;Z1\_TOBAC

Length = 775

```
-----MAS AAVATMKKRL FAPSPTSPLV SGVISSFHSL LKIRIAEK-- -Y--TKEIEG
LKEQTRNMLL ATGMKLAD-- -----T LNLIDIERL GISYHFEKEI DEILDQIY--
----- NQNSNCDDL C TSALQFRLLR OHGFNI--SP GI--FS-KFQ DENGKSKE SL
AS----- --DVLGLLN LYEASHVRTH AD--DILED A LAFSIIHLES AA-----
PHLKSPLKQQ VTHAL-EQCL HKGVPRVETR FFISSIEYE QSKNNV---- -----LLR
FAKLDFNLLQ MLHKQELA QV SRCWKDLDF- VTTL-PYARD RVVECYFWAL G-VYFEPQYS
QARVMLVKTI SMISIVDDTF DAYGTVKELE AYTDAIQRWD --IN-EIDRL P-DYMKISYK
AILDLYKDYE KE--LSSAGR SHIVCHAIER VKEVVR---- -----
----- NYNVESTWFI EG-YMP---P VSEYLSNALA TTTYYYLATT SYLGMKS---
-VTEKDFEWL SKN---PKIL EASVIICRVI DDTATYEVEK -SR-GQIATG IECCMRDYGI
-STNEAMTKF QEMAEAAWKD LNEGLLRP-- -TPVAT--EF LSRILNLARI VEVTY-IHNL
-DG-YTHPEK -VLKPHINAL LVDSIKI--- -----*
```

>P1;W7\_9SOLA

Length = 775

```
-----MAS AAVGNYYYYE I VRPVADFSPS LWGDQFLSFS IENQVAEK-- -Y--AQEIEA
LKEQTRSMML ENGRKLAD-- -----T LYLIDIERL GISYHFEKEI DDILDQIY--
----- NQNSNCNDLC TSALQFRLLR OHGFNI--SP EI--FS-KFQ DENGKFESL
AS----- --DFLGLLN LYEASHVRTH AD--DILEEA LAFSTIHLES AA-----
PHLKSPLREQ VTHAL-EQCL HKGVPRVETR FFISSIEYE QSKNDV---- -----LLR
FAKLDFNLLQ ILHKQELA EV SRWWKDLDF- VTTL-PYARD RVVECYFWAL G-VYFEPQYS
QARVILVKTI SMISIVDDTF DAYGTIKELE TYTDAIQRWD --IN-EIDRL P-DYMKISYK
```

AILDLYKDYE KE--LSSAGR SHIVCHAIER MKEVVK-----  
----- NYNVESTWFI EG-YMP---P VSEYLSNALA TTTYYYLATT SYLGMKS---  
-ATEQDFEWL SKN---PKIL EASVIICRVI DDTATYEVEK -SR-GQIATG IECCMRDYGV  
-STKEAMAKF QGMAEAAWKD LNEGFLRP-- -TPVST--EI LFRILNLARI VEVTY-IHNL  
-DG-YTHPEK -VLKPHINAL LVDSIEI--- ----- \*

>P1;V4\_9SOLA

Length = 775

-----  
-----MAS AAVGNYEEI VRPVADFSPS LWGDHFLSFS IDNHVAQK-- -Y--AQEIEP  
LKEQTRMLV ATGRKLVLD-- -----T LNLIDTIERL GISYHFEKEI DEILDQIY--  
----- NQNSNSSDLF TSALLFRLLR QHGFNI--SP EI--FS-KFQ DENGKFKESL  
AS----- ---DVVGLLN LYEASHVRTH AD--DILEAA LAFSTIHLES AA-----  
PHLKSPLREQ VAHAL-EQCL HKGVPRVETR FFISSIEYE QSKNNV---- -----LLR  
FAILDFNLLQ MLHKQELAEV SRWWKDLDF- VTTL-PYARD RVVECYFWAL G-VYFEPQYS  
QARVMLVKTI SMISIVDDTF DAYGTVKELE TYTDAIQRWD --IN-EIDRL P-DYMKISYK  
AILDLYKDYE KE--LSSAGR SHIVCHAIER MKEVVV-----  
----- NYNVESTWFI EG-YMP---P VSEYLSNALA TTTYYYLATT SYLGMKS---  
-ATEQDFEWL SKN---PKIL EASVIICRVI DDTATYEVEK -SR-GQIATG IECCMRDYGV  
-STKEAMDKF QQMAETAWKD LNEGLLRP-- -TPVSA--EL LTPILNLARI VEVTY-IHNL  
-DG-YTHPEK -VLKPHIIGL LVDSIDI--- ----- \*

>P1;A2\_9SOLA

Length = 775

-----  
-----MAS AAVANYEEI VRPVADFSPS LWGDQFLSFS IDNQIAEK-- -Y--AQEIEA  
LKEQTRMMLL ATARKLAD-- -----T LNLIDTIERL GIAYHFEKEI DEILDQIY--  
----- NQNSTFDDLC TSALQFRLLR QHGFNI--SP QI--FS-KFQ DENGKFKESL  
AS----- ---DVLGLLN LYEASHVRTH TD--NILEDA LAFSTVHLES AA-----  
PYMNSPLREQ VTHAL-EQCL HKGVPRVETR FFISSIEYE ESKNDM---- -----LLR  
FAKLDFNLLQ MLHKQELAEV SRWWKDLNF- VTTL-PYARD RVVECYFWAL G-VYFEPQYS  
QARVMLVKTI SMISIVDDTF DAYGTVKELE AYTDAIQRWD --IN-EIDRL P-DYMKISYK  
AILDLYKDYE KE--LSSAGR SHIVCHAIER MKEVVV-----  
----- NYNVESTWFI EG-YKP---P VSEYLSNALA TTTYYYLATT SYLGMKS---  
-VAEQDFEWL SKN---PKIL EASVIICRVI DDTATYEVEK -SR-GQIATG IECCMRDYGV  
-STKEAMDKF QKMAETAWKD LNEGLLRP-- -TPISA--EF LTPILNLARI VEVTY-IHNL  
-DG-YTHPEK -VLKPHIIDL LVESIQUI--- ----- \*

>P1;EK\_CAPAA

Length = 775

-----  
--MASVAVEN NVVNHIAEEI IRPVADYSPS IWGDRFLSFS IDNQVEQK-- -Y--AQEIEP

PKEQTRSMLL ASPRKLSD-- -----T LNLIDVIERL AIAYHFEKEI DEILDRIYNE  
NSNF----- EGDVYNEDLC TCALQFRLLR OHGYNI--SL EI--FS-KFL DGNGRLKESL  
AS----- ---DVLGLLS LYEASHVRSH GE--DILED A LAFSTTHLES AT-----  
PHLEYPLKEQ VRHAL-EQSL HKGIPRIEQ FFISSYDKQ AIKNDV---- -----LLR  
FAKLDYNMLQ MLHKQELAEV SRWWKDLNF- VNTL-PYARD RVVECYFWAL G-VYYEPQYS  
QARVMLVKTI AMISIVDDTY EAYGTVDELA IYTDVIQRWD --IK-RIDSL P-DYMKISYK  
ALLDLYKDYE KE--MSRDGR SHVYYAKER LKELVK---- -----  
----- SYNIEAKWFI EG-HMP---P ASEYLRNAFV TTTYYYLATT SYLGMKY---  
-AKEQQFEWL SKN---PKIL EGCVTICRVI DDIATYEVEK -NR-GQLSTG IECYMRDYSV  
-STKEAMAKF QEMGESGWKD INEGMLRP-- -TPIPM--EF LSRILNLARL VDVTY-KHNE  
-DG-YTHPEK -VIKPHIAM VVDSFKI--- -----\*  
>P1;V5\_CAPAN

Length = 775

-----  
--MASVAVEN NVVNHIAEEI IRPVADFSFS LWGDRFLSFS IDNOVETK-- -Y--AQEIEP  
LKEQTRSMLL ASGRKLSE-- -----T LNLIDVIERL GIAYHFEKEI DEILDRIYNE  
NSNF----- EGDVYNEDLC TCRLQFRLLR OHGYNI--SL KI--FS-KFL DGNGRLKESL  
AS----- ---DVLGLLS LYEASHVRSH GE--DILED A LAFSTTHLES AT-----  
PHLEYPLKEQ VRHAL-EQSL HKGIPRIEQ FFISSVYDKQ AIKNDV---- -----LLR  
FAKLDYNMLQ MLHKQELAEV SRWWKDLNF- VNTL-PYARD RVVECYFWAL G-VYYEPQYS  
QARVMLVKTI AMISIVDDTY DAYGTVDELA IYTDVIQRWD --IK-EIDSL P-DYMKISYK  
ALLDLYKDYE KE--MSRDGR SHVYYAKER LKELVK---- -----  
----- SYNIEAKWFI EG-HMP---P ASEYLRNAFV TTTYYYLATT SYLGMKY---  
-AKEQQFEWL SKN---PKIL EGCVTICRVI DDIATYEVEK -NR-GQLSTG IECYMRDYSV  
-STKEAMAKF QEMGESGWKD INEGMLRP-- -TPIPM--EF LSRILNLARL VDVTY-KHNE  
-DG-YTHPEK -VIKPHIAM VVDSFKI--- -----\*  
>P1;BH\_CAPAN

Length = 775

-----  
MASAIVDNNF VNHIEEEEEI IRPVANFAPS LWGNSFLSFS INNHVETK-- -Y--VQEIEV  
LKEQTRSMLL DTGRKLVE-- -----T LNLIDVIERL GIAYHYEKEI DDILKKNFLD  
NSN----- FDEDDFNDLC TCALQFRLLR OHGYKI--SL KI--FS-KLQ DENGKLKESL  
AS----- ---DVLGLLS LYEASHVRTH GD--DILED A LAFSTTHLES AA-----  
PHLNSPLKEQ VTHAL-ELSL HKGIPRAETR FFISSIYEQ ETKNDV---- -----LLR  
FAKLDNFLLQ MLHKQELAEV SRWWKDLNF- MATL-PYARD RAVECYFWTL G-VYYEPQYS  
QARIMLAkti AMISIVDDTF DSYGTVKELD TYTNAIQRWD --IS-EIDRL P-DYMKISYK  
ALLQLYEDYE KE--LSSNGR SHVYHAKQR MKEIVR---- -----  
----- SYNVEARWFI KG-HMP---L VSEYLSNALI TSTYYLLTTT SYLGMKS---  
-STEQDFEWL SKN---PKIL KANATICRVI DDIATYEVEK -SR-GEIATG IECYRREYGV



-STEEGMIKF SEIREAAWKD INEGMLRP-- -SSVTM--EF LTPILNLVRL IDVVY-KHNQ  
-DG-YTHPEK -VLKPHIVAL LVDSIKI--- -----\*  
>P1;BR\_PERFR

Length = 775

-----  
----- --MASEQAQN HRPVADFSPTS LWGDQFVKYD SCPQVQKK-- -Y--SNTVDV  
LKKEVKGMIT APGTKMVD-- -----T MELIDTIERL GVSFHFQDEI EQKLQFFDL  
KTDYC----- NDGDDAYDLY TVALHFRLFR QHGYRI--SC DI--FG-RWI DGNGKFKEGL  
KS----- ---DGKSLLS LYEASYLRTG GE--TILDEA LDFAAASLKS IA-----  
PHLQSPGLKQ VVHAL-VQPL HFGNPRIEAR NFIS-IYEEY EGMNEA---- -----LLR  
LAKLDYNLLQ MLHKEELHQV SRWWKDLDL- ITKL-PYARD RVVECFWAV G-VYHEPQYS  
RARVMLTKTI VMTSIIDDTY DAYGTIEELD IFTEAIERWN --VE-ETKRL P-EYMKPLYK  
ALLELYKQFE QE--LEKEGR SYVAYYAIES LKELVR---- -----  
----- SYRIEAKWFI QG-YLP---P YEEYLKNALI TCTYCYHTTT SLLGVES---  
-AIKENFEWL SNK---PKML VAGLLICRLI DDIATYILER -GR-GQVATG IESYMKDNGA  
-TQEEPIAKI FEIATDAWKD INDECLRP-- -SLYNS-RDV LMRIFNLERI IDVTY-KGNQ  
-DR-YTQPEK -VLKPHIIVF FFDPII--- -----\*  
>P1;78\_PERFR

Length = 775

-----  
----- --MASEQAQN HRPVADFSPTS LWGDQFIKHD SCPQVEKK-- -Y--SNTVDV  
LKKEVKGMIT APGTKMVD-- -----T MELIDTIERL GVSYHFQDEI EHKLQFFDL  
KPDYC----- NDDDDAYDLH TVALHFRLFR QHGYRI--SC DI--FG-RWV HGDGKFEEIL  
KS----- ---DGKGLLS LYEASYLRTG GE--TILDEA LDFATASLKS IA-----  
PCLESPLGKQ VVHAL-VQPL HFGTPRIEAR NFIS-IYEEY EGRNES---- -----LLM  
FAKIDYNLLQ MLHKEELHQV SRWWKELDL- IAKL-PYARD RVVECFWAI G-AYHEPQYS  
RARVMLTKTI AMTSIIDDTY DAYGTIKELD IFTEAIERWN --VK-ETKRL P-EYMKPLYK  
ALLELYQQFE QE--LENEGR SYVAYYAIES LKELVR---- -----  
----- SYRVEAKWFI QG-YLP---P FEEYLKNALI TCSYCYHTMT SFLGVES---  
-AIKEDFEWL SNK---PKML VAGLLICRLV DDIATYEVEK -AR-GQVATG IESYMKDNGA  
-TKEEAMAKF FEIARDAWKD INEECLRP-- -NLYNS-RDV WMRILNLERI IHVAY-KDSQ  
-DG-YTQPEK -VLKPHIIAL FVDPIQI--- -----\*  
>P1;72\_9LAMI

Length = 775

-----  
----- MAVQISETVR PFANFSPNPS LWGDQFINHK SKTQOISR-- -IY-LEEIEG  
LKNEVKCMLF STPEGKMADE-----T VNLIDTLERL GVSYHFEKEI EEKMKHLFNL  
IKADN----- YKDHEGCDLY TDALHFRLFR QHGYPI--SS GI--FN-KWM DGNGKFKESE  
KS----- ---DAKGLLS LYEACCLRTH GD--TLLDEA LVFATASLKS MA-----

ANLASPLRKQ VEHAL-FQHL HFGIPRVEAR HFIT-FYEEE EHKNE-----LLR  
FAKLDFNALQ ALHKEELSEI SKWWKDLDL- ISKL-PYARD RVVESYFWAV G-VYYQPKYS  
RARIMLTKTI AMTAILDDTY DSYGTLEELD VLTKAIERWD --IK-EINGL P-EYIKGFYK  
QVLKLYQOOLE EE--LAKEGR SYAVYYAIEA CKELAR-----  
----- SYAVEAKWFK KG-YLP---G FEEYLINSLV TSTAGYLNII SFFGVES---  
-VTKEDFEWF SKK---PRIA VATQIITRVI DDIATYEVEK -EK-GQSATG IDCYMKEHGV  
-SKEKAMQRF YEMSTNAWKD INEEGLSW-- -PSSFS-RDI FVQLRNFSRM VDVTY-GKNE  
-DG-YSKPEK -ILKPLIIAL FVDQIKL--- -----\*

>P1;RE\_MARVU

Length = 775

-----  
----- --MAAQIETR PFANFSPSPS LWGDQFTKYN SDPQVKEK-- -Y--SKQIEV  
LKNEVKSMVT AQQGKMVD-- -----T INFIDTMERL GIAYHFKDEI EETIQQFFNL  
NT----- NYEDEAYDLY TVALHFRLFR QHGHPI--SC DI--FG-KWI DGNGKFQESL  
KS----- ---DAKGLLS LYEASYLRIH GD--TQLDEA IDFATTNLKS MA-----  
PNLGSPLRKQ VENAL-VQSL HFGLPRVEAR HFIS-IYEEE QQKNHT-----LLR  
FAKLDFNLLQ ILHKEELCEL SRWWKELDF- ISQF-PYVRD RIVECFFWSV G-MYHEPQYS  
RARIMLAKSL VMITILDDTF DSYGTIEELE LLTEAMQRWD --TK-DIDGL P-EYIKEIYK  
LMLKIYQOFE EE--LAMDGK AYATHYAIEA YKELTK-----  
----- GYYVEAKWFI RG-YVP---P FEEYLSNALV TAGSKYLHFS SLLGMKS---  
-IMKKDLEWL STK---RKMI VATQTISRLV NDISSY-VEK -ER-GQPATG IECYMKDKGV  
-TKEEAMDKF YEMATNAWKD SNEECLGL-- -SGNSR--DV YIVVLNFNRI MDVTY-KNKE  
-DG-YTQPEK -VLKPHIIAL FVDQIDI--- -----\*

>P1;UW\_MENPI

Length = 775

-----  
-----MATN GVVISCLREV RPPMTKHAPS MWTDTFSNFS LDDKEQOK-- ---CSETIEA  
LKQEARGMLM AATTPLQ--- -----Q MTLIDTLERL GLSFHFETEI EYKIELIN--  
----- AAEDDGFDFL ATALRFLLR QHORHV--SC DV--FD-KFI DKDGKFEEESL  
SN----- ---NVEGLLS LYEAHVGFGR EE--RILQEA VNFTRHHLEG AELD-----  
-QSPLLIREK VKRAL-EHPL HRDFPIVYAR LFIS-IYEKD DSRDEL-----LLK  
LSKVNFKFMQ NLYKEELSOL SRWWNTWNL- KSKL-PYARD RVVEAYVWGV G-YHYEPQYS  
YVRMGLAKGV LICGIMDDTY DNYATLNEAQ LFTQVLDKWD --RD-EAERL P-EYMKIVYR  
FILSIYENYE RD--AAKLGK SFAAPYFKET VKQLAR-----  
----- AFNEEQKWVM ER-QLP---S FQDYVKNSEK TSCIYTMFAS IIPGLKSV--  
--TQETIDWI KSE---PTLA TSTAMIGRYV NDTSSQLRES -KG-GEMLTA LDFHMKEYGI  
-TKEEAASKF EGLVEETWKD INKEFIAT-- -TNYNVGREI AITFLNYARI CEASY--SKT  
-DG-DAYLDP NVAKANVVAL FVDAIVF--- -----\*

>P1;RV\_MENPI

Length = 775

```
-----  
-----MATN GVVISCLREV RPPMTKHAPS MWTDTFSNFS LDDKEQOK-- ---CSETIEA  
LKQEARGLM AATTPLQ--- -----Q MTLIDTLERL GLSFHFETEI EYKIELIN--  
----- AAEDDGFDLF ATALRFLLR QHORHV--SC DV--FD-KFI DKDGKFEEESL  
SN----- ---NVEGLLS LYEAHVGF EE--RILQEA VNFTRHHLEG AELD-----  
-QSPLLIREK VKRAL-EHPL HRDFPIVYAR LFIS-IYEKD DSRDEL---- -----LLK  
LSKVNFKFMQ NLYKEELSOL SRWWNTWNL- KSKL-PYARD RVVEAYVWGV G-YHYEPQYS  
YVRMGLAKGV LICGIMDDTY DNYATLNEAQ LFTQVLDKWD --RD-EAERL P-EYMKIVYR  
FILSIYENYE RD--AAKLGK SFAAPYFKET VKQLAR---- -----  
----- AFNEEQKWVM ER-QLP---S FQDYVKNSEK TSCIYTMFAS IIPGLKSV--  
--TQETIDWI KSE---PTLA TSTAMIGRYW NDTSSQLRES -KG-GEMLTA LDFHMKEYGL  
-TKEEAASKF EGLVEETWKD INKEFIAT-- -TNYNVGREI AITFLNYARI CEASY--SKT  
-DG-DAYSDP NVAKANVVAL FVDAIVF--- -----*
```

>P1;IZ\_MENPI

Length = 775

```
-----  
-----MATN GVVISCLREV RPPMTKHAPS MWTDTFSNFS LDDKEQOK-- -R--SETIEA  
LKQEARGLM AATTPLQ--- -----Q MTLIDTLERL GLAFHFETEV EYKIEQINA-  
----- AAEDDGFDLF ATALRFLLR QHORHV--SC DV--FD-KFV DKDGKFEEESL  
SN----- ---NVEGLLS LYEAHVGF EE--RILQEA VNFTRHHLEG AEL-----  
DQSPLLIREK VKRAL-EHPL HRDFPIVYAR LFIS-IYEKD DSRDEL---- -----LLK  
LSKVNFKFMQ NLYKKELSOL SRWWNTWDL- KSKL-PYARD RVVEAYVWGV G-YHYEPQYS  
YVRMGLAKGI LIIGIMDDTY DNYATLNEAQ LFTQVLDKWD --RD-EADRL P-EYMKIVYE  
FILSTCENYE RD--AAKLGK SFAAPYFKET VKQLAR---- -----  
----- AFNQEQKWVM ER-QLP---S FQDYVKNSEK TSCIYTMFAS IIPGLKS---  
-VTQETIDWI KSE---PTLA TSTGMIGRYW DDIGSHLRES -KG-GEMLTA LDFHMKEYGL  
-TKEEAASKF EGLVEETWKD INKEFIAT-- -TNYNVGREI AITFLNYARI CEASY--SKT  
-DG-DAYLDP NVAKANVVAL FVDAIVF--- -----*
```

>P1;NG\_OCIBA

Length = 775

```
-----  
-----MDVSILRDV RPPVTSYAPN IWADTFSNIS LDEEVQKK-- -Y--AETIEA  
LKQVVRGMLM AAATPIK--- -----Q MIFIDTLERL GLAYHFETEI EHKLOKIYDD  
----- NVCGDDCDLF TTALRFLLR QHRHV--SC DV--FD-KFL YEEGKFKG--  
----- DAEGLLS LYEASHVRFH NE--KILEEA ERFTRQELSC W-----  
IKLQSPLKDK VKRAL-ERPL HREVPILYAR HFIS-IYEKD ESMDEH---- -----LLK  
LAKFNFNLFQ NLYKKELYDL SRWWNKFDL- KTKL-PYIRD RLAEAYLWGV G-YHFEPQYS  
YVRKGVVLSI KIIGILDDTY DNYATVNEAQ LFTTEILDRWS --MD-EIDRL P-DYMKIVLH
```

FVMSAYEEYE RD-AKIVYGK KFASPYFKET IQQLAR-----  
----- GYNQELKWVM EK-QMP---P FKDYLNKSEI TSCIYIMFAS IIPGLKS---  
-FTQEAIDWI KNE---PNFA VKAGLIGRYW DDIGSHKRES -KG-GEMLTV MDCYMKQYSV  
-SIQETISEF AKAVEDSWKE VNEGWVYT-- -ISMSK--EI TVQFLNYSRM CDASY--NRN  
-NG-DGYTDP SFAKSNITAL FVDPIII--- ----- \*

>P1;QI\_9LAMI

Length = 775

-----  
----- MAAFTANAVD MRPPVITIHP RSKDIFSQFS LDDKLQKQ-- -Y--AQGIEA  
LKEEARSMLM AAKSA-K--- -----V MILIDTLERL GLGYHFEKEI EEKLEAIYK-  
----- KEDGDDYDLF TTALRFLLR QHQRV--PC SV--FD-KFM NKEGKFEEEP  
LIS----- ---DVEGLLS LYDAAYLQIH GE--HILQEA LIFTTHHLTR IEPQ-----  
LDDHSPLKLLK LNRAL-EFPF YREIPIIYAH FYIS-VYERD DSRDEV---- -----LLK  
MAKLSYNFLQ NLYKKELSQL SRWWNKLEL- IPNL-PYIRD SVAGAYLWAV A-LYFEPQYS  
DVRMAIAKLI QIAAAVDDTY DNYATIREAQ LLTEALERLN --VH-EIDTL P-DYMKIVYR  
FVMSWSEDFE RD-ATIKE-Q MLATPYFKA E MKKLGR---- -----  
----- AYNQELKWVM ER-QLP---S FEEYMKNSEI TSGVYIMFTV IS-PYLNS--  
-ATQKNIDWL LSQ---PRLA SSTAIVMRCC NDLGSNQRES -KG-GEVMTS LDCYMKQHGA  
-SKQETISKF KLIIEDEWKN LNEEWAAT-- -TCLPK--VM VEIFRNYARI AGFCY-KNNG  
-DA-YTSPKI --VQOCFDAL FVNPLRI--- ----- \*

>P1;2B\_ARATH

Length = 775

----- MEATSVFWPK LGSQIFLSSS TNLWPLSKLY GFHLTSFPSK  
PLKHIRLKAT NTLTFDDQER IRKFKKLPTS EWTHYGHISIS IDVSEMDA-- -L--RKEIDA  
LKPILKSTLM SFKIDSTK ---R ILMIYLLVSL GLAYHFEEI YETLKMSFEN  
ID----- KMMDGEDDLY TVSIIFWVFR RHGYHI--SY GV--FQ-RFK GSNGNFKESL  
TR----- ---DAKGLMS LYEAANLGT KD--FILEEA LSFTSSHLES LAA-----S  
GTCPPHLSVR IRNAL-GLSQ HWNMEMLVPV EFIP-FYEQE IEHDEM---- -----LLK  
FAKLSFKLGO LOYLQELKTL TKWYKELDF- ATNLPPYFRD RIVEHHFLVQ A-VFFSPQLS  
RERIMMIQYF TGLALLDDTF DRYASLHEAE SLANSLERYT --IR-PMDKQ P-DYLRFVLN  
FILDTFEE-- -----  
----- LEKWAQ AD-HIP---S FEEYMEVGEV EVTUYASLAG IFMSMGKM--  
-ATKEAFEWL KSR---PKLV QYLSIKGRM NDLMGYEDDM -SR-GYVTNA VNCYMKQYGV  
-TKEAFREL YKIVVAANKT LNEEFLLST-- -TGVPH--FL LKATIDLARM MTVAY--NVN  
-EG-F'TNPQG -KIKEYMTSM FVDQIHI--- ----- \*

>P1;4N\_ARATH

Length = 775

-----  
----- MEAK FGSQISLHFR TNSFPLRKLY GFPLTTFSGT  
SLNHLRLKAT NTLKGDQES IRKFKKLPTS EWTHYFHSFV VDVSEMDA-- -L--RNEIDA

```

LKPVKNTIM SSQGIDSTK- -----KR  ILMIYMLVSL  GLAHHFEEEI  YETLRDGF GK
IE----- EMMEDEDDLC TVSIIFWAFR RYGHYI--SS DV--FR-RFK GSNGNFKESL
TG----- --YAKGMLS LYEAHLGTT KD--YILQEA LSFTSSHLES LAAC-----
GTCPPHLSVH IQNVL-SVPQ HWNMEILVPV EYIP-FYEQE KDHDEI---- -----LLK
FAKLSFKLLQ LOYIQDLKIV TKWYKELEF- ASKLPPYFRD NIVVNYFYVL A-VIYTPQHS
YERIMLTQYF TCLAILDDTF DRYASLPEAI SLANSLERWA P-ND-AMDKQ P-DYLKIVLN
FILKTFEVFQ KE--LEPEGR SYTVKATIEE FKTIVK---- -----
----- GNFDLAKWAH AV-HVP----S FEEYMEVGEE EISVCSTLAG IFMCMEQK--
-ATKEDYEWL KSR---PKFI QTLCARCLK NDITGFEDDM -SR-GYVTNA VNCYMKQYGV
-TKQEAFGEL NKIIVEADKI LNEEFLTT-- -VGVRH--CV LKATFDLARM IFITY--NGY
-EG-FTYPOG -KIKEYMTSL FVDRIGL--- -----*

```

>P1;Z6\_ARATH

Length = 775

```

-----M HSISFVVNME VISIFGPKHG SLISLHSSYN LFKVSKVTRF RRTLFP SNHA
KVFRFKALTC D-----NQES NNMFKELPTS EWTHHFHSIQ VDVSEMDA-- -I--RIEIDA
LKPVKKNILM SFQGIDSTK- -----KR  ILMIYMLISL  GLACQFEEEI  YETLKEGFGK
IE----- EMMANEDLY TVSIIFWVFR RYGHYI--SS DF--FR-RFK GNDGNFKKSL
IG----- --DAKGMLS FYEANMATT KD--YILDEA LSFTSSHLES LAAN-----
GACPPHMSRR IRNAL-NASQ HWNMEMLVAV EYIS-FYEKE KDHNEM---- -----LLK
FSKLNFKFLQ LOYLQELKVL TKWYKEVDF- VSKLPPYFRD RIVENHFFIQ T-LFVESQHS
RARIMMAKYF ILLVIQDDTL DRYASLPEAE SLVNSLNRWA P-DH-AMDKQ P-DYLKVFVK
FILDTFEEFE KE--LRPEGG SFGVCATIEE FKSLVK---- -----
----- ANLEAEKWAL AD-NMP---S FEEYIEVTGV GITAMTTLMG AMMCMGKI--
-VPKEDYKWL KSR---PKII QALAIKGRM NDMKGYKEDM -SR-GYAANA VTCYMKQYRV
-TEQEALKEF EKMVAVANKT VNEEFLTT-- -MGVSR--LV LKLAMGVGLM ISITY--SED
-EG-YTHPEG -KIKEKMTTL FVDQIPL--- -----*

```

>P1;3L\_ARATH

Length = 775

```

----- --MEAIKT FSPKFGFQIS LSPRTHLTPV RFPPTACPVK
PANLVRLKAT RALIRDPQES NRKFQKPPS EWTNRFDVSVDASEMDA-- -L--RKEIDK
IIPNVKKELM SSQGIESTK- -----KK  ILMVYLLVSL  GLAYHFEDEI  EECLKEGFET
IE----- EMMAGEDNLY TISIIFLVLR TYGHHM--SS DI--FQ-KFK GNDGNFKGCI
SG----- --DAKGLLA LYEAQLRRT TE--YIMEEA LSFTSSNLEL LAAD-----
GRCPPHLSKH IRNAL-GLSQ HKQMEVLVAV EYIS-FYEQE KDHDKI---- -----LLK
FAKLNFKLMQ LHYLEELKVV TKYEHDFAS- --NLPPYFKY VIVENHFFAI T-MYFEPKFS
QKRIMLAKYF TVLVLLDDTC DRYASLSEAE SLTNSLERWA P-DD-AMDKQ P-HYLKVFVK
FIMGCFEEFE RE--LASEGR SYSVKATIEE FKTIVK---- -----
----- ANFDFAKLAH TG-HVP----S FKEYMEVGEE EVGVCATLAG NLMCIGHI--
-GDEGVYEWL KSR---PKFL KAASTYGRM NDIAGFEDDM -KR-EYVITG VNTYMKQYGL

```

-TKMEAIREL QNLVEYNHTI MNEEFLKT-- -TDLPR--QI RKQVINVAR S LNVSY--TEG  
-EG-FTHTKG -KVDEYITSL FITPIRI--- -----\*  
>P1;RM\_ARATH

Length = 775

-----MET ITVFGPKHGS PLSLPSRTNM CWEMKPSRFP  
LTSVRGKPAK QVGLKVSASC DRPISKLPSS KWTNYFHSVL VDVSEMDV-- -L--EREIEA  
LKP NVREMLM SSKGYDSVKK -----R SLM IYLLVSL GLAYHFEEEI EKSLKDGFEK  
ID----- EIIAGEDDL Y TISTIFWVFR TYGYNM--SS DV--FR-RFK EENGKFKESL  
IE----- ---DARGMLS LYEA AHLGTT TD--YILDEA LDFASN LVS LAED-----  
GMCPSHLSTH IRNAL-SISQ HWNMEIIVAV QYIR-FYEQE VGHDEM---- -----LLK  
FAKLNFNLVQ RLYLQEVKIL TKWYKDQDI- HSKLPPYYP VVTEMHFFST A-TFFEPQFS  
HARILQTKLF MAELLVDDTC DRYATFSEVE SLINSLQRWA P-DD-AMDT H P-DYLVKVVFK  
FILNAFEECE KE--LRPQGR SYSLEQTKEE YKRFK---- -----  
----- SNLDLAKLAQ AG-NVP---S FEEYMEVGKD EIGAFVIVAG SLMGMDNI--  
-DAVEAYDFL KSR---SKFS QSSAEIVRYL NDLAGFEDDM -RR-GCVSTG LNCYMNQYGV  
-TEVEVFREF RKMVMNTCKI MNEEFLKT-- -TDVPL--RV LKTNFSCVRS GFVGY--NEG  
-EG-VTYPEG -KITKYL TSL YVDQI----- -----\*  
>P1;6V\_ARATH

Length = 775

-----M EAIRVFGPKL GSRLSIRSHT TAFPACKLSR FPLTSFPGKH  
AHLVLLKATT IPLASGDKEN NRKFEKLGPS EWGNQFLFAH VDLSEMDA-- -L--EREIEA  
LKP KVRDMFM SFKGMKSNK- -----KN LFLIYLLVSL GLAHHFEDEI EESVKGCSQE  
MV----- EMMDGENDLY TVSIIFWVFR TYGHNI--SS DI--FN-RFK GHNGKFK ECL  
AT----- ---DAKGILS LYEA AHMGTT TD--YILDEA LSFTLSYLES LAAN-----  
GTCKPNLVRR IRNAL-GLLQ NKNVEILVAK EYIR-FYEQE EDCDKT---- -----ILE  
FSMLNLKFLQ LHYLQELKLL TKWYKEQDF- ESKLPPYYP RIVELHLATL --AYINPKYS  
RVRIILTMIY TIQIILDDTC DRYASLREVE SLAATIERWD HNDH-AMEGL P-DYLKSVAK  
FIFHTFQEFE RE-VSSESGG SYSLKATIED CKRMMR---- -----  
----- SNLQLAKWAV TG-HLP---S FDEYLDVAGV EIAVYFTVAG ILLGMENI--  
-NKKEAYEWL IFR---DKLV RAMSTKARLV NDLFGYKDDM -RR-GYVTNS INCYKKQYGV  
-TEEEAFRKL HQMVADGDKM MNEEFLKP-- -INVPH--QV LKAVLDTLRA INICY--DNE  
-DG-FTRLNG -NLKNYITSM YVDL----- -----\*  
>P1;93\_ARATH

Length = 775

-----MYSIS LVVNMQCISA YGSILSLPLR SNLFSVRKLS SFPHKSFSGQ  
HGKLVRMKAT PTRACHDQES NRKFKRLPLS KWGHHFLSAQ VDVSEMNA-- -L--AQEIER  
LKPEVGEMLM FSSKSIESTK -----KR ILFIYMLVSL GVAHFEEDEI EQSLEEGFEK  
IQ----- EMIAGEDDL Y TISIMFWVFR TYGYNM--ST GDV-FK-RFK GENEKFMESI  
TS----- ---DVKGMVS LYEA AHLRTT RE--DILEEA LSFTTRNLES LAR-----A

GASSPHILMR IRNAL-CMPQ HYNAEMIFAR EYIS-FYEQE EDHNKM---- -----LLR  
FAKINFKFLO LNWIQELKTL TKWWKQODL- ASKLPPYFRD RLIECYLFAI M-IYFEPQFS  
LGRVSLAKIN TVFTLVDDTC DRYGNVSEVA ALVQCVERWD --PD-CMDSL P-DYMKTVFK  
FAWNTFEECE NA--GIMEEG LSYD----- -----  
-----VOGALEEWEO GD-VVP---T FDEYLEIGGV EVTMYVSIAC SFLGLGQS--  
-SREQAYKWL KSR---PKFV EAQAKRARLM NDIAGFEGDM -SR-GFDVNA IMYYMKQYKV  
-TEETFTLRL QKMARDLDTT VNEEILKT-- -TKSVP-RQI LKRAIDFGKM IEFTY--RSG  
-EE-YTHPEG -RFKDHITSL FVDLIRL--- -----\*  
>P1;DQ\_ARATH

Length = 775

-----MKTL TFFGPKYGTQ VSLLSPNVVS KLSRFPLTSF  
ARKPTKPVCV KTTDCDLVES QRTFNKFP RS DWGDHFLRLP FNVSDMDM-- -L--TIEMNA  
LKSTIRKMLM YSQDVEETKE -----R ILIIYLLVAL GMAYHFEDEI DDNLKHGFEN  
IE-----TTMAGENDLS TVSVMFVWSG HMDITCLPVR NM--FR-RFK GEDGKFEECH  
TK-----DVKGLLS LYEAAQLGTS TE--DILDEA MSFSSSHLEC LAG-----  
GTCPPHISRL IQNEL-YMPQ HHNAEILFAS EYIS-FYKQE DVHNKV---- -----LLE  
FAKLNFKFLO LHWIHELKIL TKWWDQDL- LSKLPPYFRD RMVECHLYAV I-YYFEPQYS  
FGRIMLAKLL VLLTVVDDTC DRYGSVPEVA KLLDCVERWD --PE-LGESL P-DYLKTVFK  
FTLDVFEDCE RA--GKSEEG LSFN----- -----  
-----VDGALAEWAA AE-KVP---T VEEYLEVGGV AVTMYATIAL GLLGLGPK--  
-AREHGYEWL KSR---PKLV HDLATKGRM NDMGGFKDDI -GR-GFLANV VNYYMKEYGT  
-TEETYKEF HKIVRDLEKS VNSEFLKI-- -NKGVP-REI LSRALNCGKM IDVTY--RSG  
-DG-YTRPRG -KFTEYVESL FVEHMDAPVM QYASSSTL-- -----\*  
>P1;ZS\_ARATH

Length = 775

-----M EALGNFDYES YTNFTKLPSS QWGDQFLKFS IADSDFDV-- -L--EREIEV  
LKPQVRENIF VSSSTDKDAM -----KKT ILSIHFLDSL GLSYHFEKEI EESLKHAFEK  
IE-----DLIADENKLH TISTIFRVFR TYGYM--SS DV--FK-IFK GDDGKFESL  
IE-----DVKGMLS FYEAVHFGTT TD--HILDEA LSFTLNHLES LATGR-----  
RASPPHISKL IQNAL-HIPQ HRNIQALVAR EYIS-FYEHE EDHDET---- -----LLK  
LAKLNFKFLO LHYFQELKTI TMWWTKLDH- TSNLPPNFRE RTVETWFAAL M-MYFEPQFS  
LGRIMSAKLY LVITFLDDAC DTYGSISEVE SLADCLERWD --PD-YMENL Q-GHMKTAFK  
FVMYLFKEYE EI--LRSQGR SFVLEKMIEE FKIIAR---- -----  
-----KNLELVKWAR GG-HVP---S FDEYIESGGA EIGTYATIAE SIMGLGEI--  
-GKKEAFEWL ISR---PKLV RILGAKTRM DDIADFEEDM -EK-GYTANA LNYYMNEHGV  
-TKEEASREL EKMNGDMNKI VNEECLKI-- -TTMPR--RI LMQSVNYARS LDVLY--TAD  
-DV-YNHREG -KLKEYMRL LVDPIILL--- -----\*  
>P1;UPI0000EC9D39\_3702

Length = 775

```
-----  
----- MESQTKFDYE SLAFTKLSHS QWTDYFLSVP IDDSelda-- ---ITREIDI  
IKPEVRKLLS SKGDDETSKR -----K VLLIQSLLSL GLAFHFENEI KDILEDafRR  
ID----- DITGDENDLS TISIMFRVFR TYGHNL--PS SV--FK-RFT GDDGKFERSL  
TE----- ---DAKGILS LYEAHLGTT TD--YILDEA LEFTSSHLKS LLVG-----  
GMCrPHILRL IRNTL-YLPQ RWNMEAVIAR EYIS-FYEQE EDHKM---- -----LLR  
LAKLNFkLLQ LHYIKELKTF IKWWMELGL- TSKWPSQFRE RIVEAWLAGL M-MYFEPQFS  
GGRVIAAKFN YLLTILDDAC DHYFSIPELT RLVDCVERWN --HD-GIHTL E-DISRIIFK  
LALDVFDdig RG--VRskGC SYYLKEMLEE LKILVR---- -----  
----- ANLDLVKWAR GN-QLP---S FEEHVEVGGI ALTTYATLMY SFVGMGEA--  
-VGKEAYEWV RSR---PRLI KSLAAKGRlm DDITDFESDM -SN-GFAANA INYYMKQFVV  
-TKEEAILEC QKMVVDINKI VNEELLKT-- -TTVPR--RV LKQALNFGRL LEVLY--TKS  
-DD-IYncSE GKLKEYIVTL LIDPIHL--- -----*  
>P1;R8_ARATH
```

Length = 775

```
-----M EASKCFGPRt LPIIHNVPLC LKTnFSLFPR CLlQSQSLSS KKSTKHDLFR  
VKAET----- ---SGDLEN TRPLTYYSps LWGDHFLSVP IDESKFEA-- -LE-KEIESV  
FKPKVRDMLM SPHSSDKE-- -----R IRLIHLLISL GIAYYYENEI EEILHKAYGK  
LA----- CLISDEDDLE TIAIMFEVFR LYGHKM--PC DV--FE-RFK SEDGKFESL  
VG----- ---DVRGLLQ MYEAHLGAP SE--DIMDEA LSFARYHLES LVS-----  
HETSSNLFNH VQNEL-YRAR YHSIEILVAR QYIS-FYEQE EDHDET---- -----LLR  
FSKLNFNFCQ MHYVKDLKIV TRWWKELGI- ASKLPYSIRE RNVEVYLGSL G-MFFEPryS  
LARIFSAKLT MILTVVDDTC DSYATLPEVK SLHDafHRWD --LR-AMEEL P-RYMRiiYQ  
SVFETVEDID RE--MIARGK HGRLQLTIDE IKSLMI---- -----  
----- WYLGIAKWAR SD-QVP---S FEDYMEIGTP SSALDDLASY GFIAMDDC--  
-DQKklKEWF YSK---PKIF HALNALFRIR NDIVTFEQEM -SR-GEVANG VNCYMKQHGv  
-TKEAAVEEL RKMERENYKI MIEEFMTS-- -KAMPR--QI LVRPVNIARV MDLYY--KEA  
-DG-FGHPDQ -KLLQLIASL FLHPIPL--- -----*  
>P1;L5_ARATH
```

Length = 775

```
-----M AVARTVFLGL TLSYLHQAPL FLKTSQSLFP RPSLSLKPMK  
HDFVCVKATT KSSTSDDLES GRPSILFSPS IWGDYFLSVS VDDSEfDD-- -IA-REIESV  
MKPYVRDRli SSHNSNKD-- -----K IRLIHLLISL GISYYFESEI EMILNKAFEE  
LD----- MIIAEEDDLE TISIMFEVFR LYQHkm--SC DS--FV-RFK GEDGRLKESL  
VG----- ---DVRGMLQ LYQAAHLGTP SD-QYIMEEA KSfTRNHLES LVES-----  
TTIPPHfSSH IRDAL-YIDR YHNMEILVAR KYIS-FYEQE EGHDLT---- -----LLK  
FGKLSFNyCR LHYIQELKTL TKWwKQDI- PSNL-PCVRD RIVETYfPTL G-LYFEPRFs  
LGRIIIakMT IIVVALNDVC DSYATYPEAK SLIDSLQRWD --IE-AIDEL P-NYSRIVLR
```



LILETIGEIE RE--MKPRGR SASVQHTIDE TKSLGR-----  
-----AYLALSKWAS EG-YMP---T FDEYMEVGEV TGGMDDFALY SFIAMEDC--  
-DEKPLYEWF DSK---PKIL QALSVLYRIN NDIVTYEREM -SK-GEVVNG VNSYMNQHG  
-TKEEAVEEL RKMARDNYKI VMEELLTI-- -TDVPR--PV LVRCLNLARL FDVFC-KHGN  
-DE-FYTPHG -NLKDLITSI FIHPIPV--- -----\*  
>P1;KF\_ARATH

Length = 775

-----MGFRAKTLP HLGNGTRLPL KTKLSLFPMH LLQNHTTSLR  
RSTKLNLCVK ACSKTSQVES SRPLPHSAPD LWGDHILSV TENS-SEFD-- -TL-ETEIES  
IKPKVRNMLM SSHKTDKE-- -----R ICLIHLLICL GTFHYFEKEI EEILEQAFRK  
LD-----MLFTDEDDLE TTAIMFEVFR LYGHKI--SC DV--FD-RFK GVDKAFKEHL  
VS--------DVRGMLQ LYEAAHLATP FE--TILDEA LSFTRYHLES LAG-----Q  
QATAPHISRH ILNAL-YKPR FLKMEIIAAR EYIH-FYQKE GHDET-----LLK  
FAKLNFNFCQ LHYVRELKTL TKWWKDIDL- PYKL-PYIRD RLLETFIGVM A-VYLEPHYS  
LGRIIATKVS QVIVVMDDTC DAYGTFSEVR SLIDSLERWD --PG-AIDKL P-SCLRIVIQ  
SIVETMEDIE RE--MKPRGR SSSVQDTVEE IKIMGR-----  
-----AYAEISKWAR AG-HVP---T FDDYIELGLD SSGIRCFAMY SFISMEDC--  
-EENQTNAWF KSK---PKML RALSVIFRLT NDIAGFEEEM -RR-GEVVNG VNCYVKQHN  
-TKELAVREI KKMIRDNYKI MMEEFLTI-- -KSVSR--PI LVRCFNIVRL VNLYY--EEG  
-DN-FTNPNG -KLKDLITSL FFHPLPL--- -----\*  
>P1;5Z\_ARATH

Length = 775

-----MEATRMGF GGLSVPLSLT PNLSLIPQRL LDKHNLSLKP  
VKIHHLVCVR STKSSDDLET SRPSTYFSPS LWGDHFLSVS LDHAEFVE-- -L--EREIET  
MKPLVKDMLM SSQSSDKE-- -----K IRLIHLVSL GSSYHFDKEI QDILKHSFTK  
LD-----GIIVEEDDLE TISIMFEVFR LYGHKM--SC DA--FD-RFR GGDGRFKESL  
AK--------DVRGMLQ LFEVAHLGTL SE--DIMDEA LRFTRNHLES LTSGNV----  
SSASPHILKH IQNSL-YIPR YCNIEVLVAR EYIS-YYEQE EGYNEI----LLK  
FAKLNFNFCQ CHYIQEIKTL TKWWKDIDL- ASKL-PYIRD RSVESHGGL G-PYFEPQYS  
LGRIIVAKTI MIIVVADDTY DAHATIPEAT VLTEYFQRLN --IG-ADDKL S-GYLRIVLE  
SVFEVMGEIE QE--MSPKGR SYSVKQVLER FKIIAK-----  
-----AYKQLTEWAR KG-HVP---T FDEYMKVGLV TAGMGDYAGY CFIGMEDI--  
-NEKEAFEWL NSN---PLLI DALNVLFRIA NDVGTYETEI -NR-GEVANG LNCYMKQYGV  
-TKEEASREL RKMYYNKKV VVEEFMNS-- -HDRVP-RQV LLRCLNFARL FDVIY--TEG  
-DG-YSEPKG -KIEHFMTSL YVHPIPLS-- -----\*  
>P1;DM\_ARATH

Length = 775

-----M DATRTFFGLP NVHNVPLCLT SNLSLFPQRL LQKHTLPLKP  
VKRHHLVCVR STKSSDDLEG SRPSTYFSPS LWGDHFLSVS LDRGEFDE-- -L--EREIET

```

MKPLVKDMLM SSQSSDKE-- -----K IRLIHLLVSL GSSYHFDKEI QDILKHSFTK
LD----- DIIVGEDDLE TISIMFEVFR LYGHKM--SC DA--FD-RFR GEDGRFKESL
AK----- ---DVRGMLQ LFEVAHLGTP SE--DIMDEA SSFAQNHLES WIAGNV----
SGATPHLLKH IQNSL-YIPR YCNIEVLVAR EYIS-YYEQE EGYDEI---- -----LLK
FAKLNFNLCQ FRYIQELKTL TKWWKDLDL- ASKL-PYIRD RLVESHGGL G-PYFEPHYS
LGRIIVAKII MTMVVDDTY DAHATVPEVA VLTECLQRLN --IG-ADDKL P-DYLRIVLE
SVFEVMGEIE QE--MRPKGR SYGVKQVLER FKNVAK---- -----
----- ADKQLTEWAR TG-HVP---S FDEYMKVGLV TAGMDGYAGY CFIGMEDI--
-SEKEAFEWL SSN---PLII QALNVMFRLA NDVGTYETEI -NR-GEVANG LNCYMKQYGV
-TKEEASQEL RKIYSNNKKV VMEEFMNS-- -HDHVP-RQV LLRCLNFARL FDMY--TEG
-DG-YSEPKG -KIEHFMTSL YVHPIPLS-- -----*

```

>P1;NK\_ARATH

Length = 775

```

----- --MEAIRIGF GLPNVHSVPL CLTTTRCLFP RQRLLSHTP SWKPAKQODF
FVASSSKS- ----SDDLES SLPTPHFSPS LWGDHFLSVS LNRAVEFD-- -EL-EREIET
TKPLARDKLM SSESSDKE-- -----K IRLIHLLVSM GISYHFDKEI QDILKHSFTK
LD----- DIIVGEDDLE TISIMFEVFK LYGHKM--SC DA--FD-RFR GNDGRFKESL
VR----- ---DFRGLMQLFEVAHLGTP CE--VIMDEA LSFTRNHLES LTSGNA----
STASPHLLKH IQNSL-YIPR YCNIEVLVAR EYIS-YYEQE EGHDEI---- -----LLK
FAKLNFNFCQ FHYVQELKTL TKWWRDLDL- ASKL-PYIRD RLVESHVAL G-PYFEPHYS
LGRIIVAKIN MIMVVDDTY DAYATLPQVK ALTECLQRWS --IE-VSDKL P-DYLRIVLG
SLFDVMGEIE RE--MRPLGR LYRVKQVVEK IKIITK---- -----
----- AYQEIAKWAR TG-HVS---T FDEYMKVGVL TAGMADYAA Y CFIGMEDI--
-NEKEAFEWL NSN---PLII KHLTAMFRLA NDVGTYETEI -NR-GEVANG LNCYMKQYGV
-TKEEASREL RKMYVYRKKV VVEEFMNS-- -HDHVP-RQV LLRCLNIARI FDFVY--TEG
-DG-YSEPKG -KIEHFMTSL YLHPIPLS-- -----*

```

>P1;8M\_ARATH

Length = 775

```

-----M EAITKYGSYS NVRFLSR-LC WRLNLSSSYH YPLLKSSLSF SRFQSPKKLC
LVRATTNP-- ----TDDNST TRSFTPHPPS LWGHHFLSAS VNQTEMDD-- -L--WRQIEA
LKPIVNAMLL PCNGADAKK- -----I TCFIHTLVSL GVSYHFEERI VEFLKDVFN
IEDI----- IIDCKEDDLY TVSVIFRVFR LYGHYI--TP DI--FN-RFK GDDGNFKKCL
ND----- ---DVRGMLS FYEASHFGTT TE--DILEEA MSFTQKHLEL FLVGE----K
AKHYPHITKL IQAAL-YIPQ NFNLEILVAR EYID-FYELE TDHNEM---- -----LLK
LAKLNFRFLQ LOYIQDLKTL TTWWKELDL- VSKIPVYFRE RLAEPYFWAT G-IYYEPQYS
AARIMLAKSI ILGDIVDNTF DVYGTIDEVQ SLVQAIERWD --SD-AVDVL P-DYLVKVVFR
TTFDLFKELE EY--VSSEAR SFTMQYAYEQ LRILMK---- -----
----- GYLQEAWSN RG-HLP---S HEEYIEVGVA STAGEVLLAM TFIPMGDA--
-AGVGVYEWL RSR---PKLT HALFVKSRLR DDIATYKEEM -KR-GDVCNG INCYTKQHKV

```

-SEEEACIEF EKKTNHMSKV MNEEFLKA-- -AKFIP-LHI LRPVLNYGRL ADVCY--KYG  
-DG-YTFAGE -KIKDYITSL YVDLITL--- -----\*  
>P1;M6\_RICCO

Length = 775

-----MA LPSAAMQSNP EKLNLFHRLS SLPTTSLEYG NNRFPFFSSS  
AKSHFKKPTQ ACLSSTHQE VRPLAYFPPT VWGNRFASLT FNPSEFES-- -Y--DERVIV  
LKKKVKDILI SSTSDSVE-- -----T VILIDLLCRL GVSYHFENDI EELLSKIFNS  
QPD----- LVDEKECDLY TAAIVFRVFR QHGFKM--SS DV--FS-KFK DSDGKFKESL  
RG----- -DAKGMLS LFEASHLSVH GE--DILEEA FAFTKDYLOS SA-----  
VELFPNLKRH ITNAL-EQPF HSGVPRLEAR KRID-LYEAD IECRNET--- -----LLE  
FAKLDYNRVQ LLHQOELCQF SKWWKDLNL- ASDI-PYARD RMAEIFFWAV A-MYFEPDYA  
HTRMIIAKVV LLISLIDDTI DAYATMEETH ILAEAVARWD --MS-CLEKL P-DYMKVIYK  
LLLNTFSEFE KE--LTAEGK SYSVKYGREA FQELVR---- -----  
----- GYYLEAVWRD EG-KIP--S FDDYLYNGSM TTGLPLVSTA SFMGVQEI--  
-TGLNEFQWL ETN---PKLS YASGAFIRLV NDLTSHVTEQ -QR-GHVASC IDCYMNQHG  
-SKDEAVKIL QKMATDCWKE INEECMRQ-- -SQVSV--GH LMRIVNLARL TDVSY--KYG  
-DG-YT-DSQ -QLKQFVKGL FVDPISI--- -----\*  
>P1;Y3\_ARTAN

Length = 775

-----MAAVQA  
NVTGIKANT- ----K TSAEP VRPLANFPPS VWGDRFLSFS LDRSELER-- -Y--AIAMEK  
PKEDLRKLIV DPTMDSNE-- -----K LGLIYSVHRL GLTYMFLQEI ESQDKLNFNK  
FS----- LQDYEEVDLY TISINFQVFR HVGYKL--PC DV--FN-KFK DVSSGTFKAS  
IT----- -SDVGVVG LYESAQLRIR GE--KILDEA SVFTEAKLKS VV-----  
NTLEGDLAQQ VTQSL-RRPF HQGMPLGIRQ GSIS-LTMKK NVPLMTH--- -----CLK  
LAKLHFKYLE LQOKEELRIV SKWWKDMRF- HETT-PYIRD RVPEIYLWIL G-LYFEP  
LARIATKIT LFLVVLDDTY DAYATIEEIR LLTDAINKWD --IS-AMEQI P-EYIRPFYK  
ILLDEYAGNW RR-KWLKKG QILLLLQKKR SKTLAR---- -----  
----- GYLEEAETN SG-YVA--S FPEYMKNGLI TSAYNVIKSKS ALVGMGEI--  
-VSEDALAWY ESH---PKTL QASELISRLQ DDVMTYQFER -ER-GQSATG VDAYIKTYGV  
-SEKEAIDAL KIMIENAWKD INEGCLKP-- -RQVSM--DL LAPILNLARM IDVVY--RYD  
-DG-FTFPRK -DSERVYQSF CLWVLYPV-- -----\*  
>P1;KZ\_LACSA

Length = 775

-----  
--MAAVDTNA TIOEKTAEPR VRPLANFPPS VWGDRFLSFT LDNSELEG-- -Y--AKAMEA  
PKEELRRLIV DQTMDSNK-- -----K LSLIYSVHRL GLTYLFLQEI EAQLDKIFKE  
FN----- LQNYDEVDLY TTSINFQVFR HLGYKL--PC DV--FN-KFK DNTSGAFKED  
IST----- -DVKGMLG LYESSQLRTR GE--SILDEA SSFTETKLKS VV-----

NNLEGNLAQQ VLQSL-RRPF HQGMPMVEAR LYFS-NYSEE CATHEC-----LLK  
LAKLHFSYLE LQQKEELRIV SKWWKDMRF- QETT-PYIRD RVPEIYLWIL G-LYFEPRYS  
LARIATKIT LFLVVLDDTY DAYATIEEIR LLTDAINRWD --MS-AMEQI P-EYIRPFYK  
ILLDEYAELE KQ--LAIEGR AKSVIASKEA FODIAR-----  
----- GYLEEAEWTN SG-YVA---S FPEYMKNGLI TSAYNVISKS ALVGMGDI--  
-VSENALAWY ESH---PKTL QASELISRLQ DDVMTYQFER -ER-GQSATG VDAYIKTYGV  
-SEKEAIDEL KIMIENAWKD INEGCLKP-- -REVSM--DL LAPILNLARM IDVVY--RYD  
-DG-FTFPGK -TMKEYITLL FVGSVSM--- -----\*

>P1;97\_9ASTR

Length = 775

-----  
MAAVEANGTL QANTKTTTEP VRPLANFPPS VWGDRFLSFS LDNKELEG-- -Y--AKAMEE  
PKEELRRLIV DSTMDSNK-- -----K LSLIYSVHRL GLTYLFLQEI EAQLEKLFKE  
FN----- LQDYDEVDLY TTSINFQVFR HLGHKL--PC DV--FN-KFK DSTSGKFKEY  
ITN----- ---DVKGMLG LYESAQLRVR GE--SILDEA SAFTETKLKS VV-----  
NTLEGKLEEQ VMQSL-RRPF HQGMPMVEAR LYFS-NYTEE CATHAS-----LLK  
LAKLHFSYLE LQQKEELRIV SQWWKDMEF- QTSV-PYIRD RVPEIYLWIL G-LYFEPRYS  
LARIATKIT LFLVVLDDTY DAYATIEEIR LLTDAINRWD --IS-AMEQI P-EYIRPFYK  
ILLEEYAELE KQ--LAKEGR EKSVIASKQA FODIAN-----  
----- GYLEEAEWTN SG-YVA---T FPEYMKNGLI TSAYNVISKS ALVGMGEM--  
-VSEHALAWY ESH---PKTL QASELISRLQ DDVMTYQFER -ER-GQSATG VDSYIKTYGV  
-SEKEAIDEL NKMIENAWKD INEGCLKP-- -REVSM--DV LAPILNLARM IDVVY--RYD  
-DG-FTFPGK -TMKEYTTLL FVGSSPM--- -----\*

>P1;D7\_CICIN

Length = 775

-----  
-MAAVEANGT FQANTKTTTEP VRPLANFPPS VWGDRFLSFS LDTTELEG-- -Y--AKAMEE  
PKEEVRKLIV DPTMDSNK-- -----K LSLIYSVHRL GLTYLFLQEI EAQLDKLFKE  
FN----- LQDYDEFDLY TTSINFQVFR HLGHKL--PC DV--FN-KFK DSSSGTFKES  
ITN----- ---DVKGMLG LYESAQLRLR GE--PILDEA SAFTETQLKS VV-----  
NTLEGNLAKQ VMQSL-RRPF HQGMPMVEAR MYFS-NYDEE CSTHES-----LPK  
LAKLHFNLYQ LQQKEELRIV SKWWKDMRF- QETT-PYIRD RVPEIYLWIL G-LYFEPRYS  
LARIATKIT LFLVVLDDTY DAYATIEEIR LLTDAINRWD --IS-AMEQI P-EYIRPFYK  
ILLDEYAELE KQ--LAKEGR AKSVIASKEA FODIAR-----  
----- GYLEEAEWTN SG-YVA---S FPEYMKNGLI TSAYNVISKS ALVGMGEM--  
-VGEDALAWY ESH---PKTL QASELISRLQ DDVMTYQFER -ER-GQSATG VDSYIKTYGV  
-TEKEAIDEL NKMIENAWKD INEGCLKP-- -REVSM--DL LAPILNLARM IDVVY--RYD  
-DG-FTFPGK -TMKEYITLL FVGSVSM--- -----\*

>P1;N8\_LACSA

Length = 775

```
-----  
MAAVEANGTL QANTKTTTEP VRPLANFPPS VWGDRFLSFS LDNTELEG-- -Y--AKAMEE  
PKEEVRLIV DPTMDSNK-- -----K LSLIYSVHRL GLTYLFLQEI EAQLDNIFKA  
FK----- LQDYDEVLDY TTSINFQVFR HLGHLK--PC DV--FN-KFK DSSSGTFKES  
ITN----- ---DVKGMLG LYECAQLRLR GE--SILDEA SAFTVTQLKS VV-----  
NTLEGKLAQQ VLQSL-KRPF HQGMPMVEAR FYFS-NYDEE CSTHES---- -----LVK  
LAKLHFNYLQ LQOKEELRIV SKWWKDMRF- QETT-PYIRD RVPEIYLWIL G-LYFEPRYS  
LARIATKIT LFLVVLDDTY DAYATIEEIR LLTDAINRWD --IS-AIEQI P-EYIRPFYK  
ILLDEYAELE KQ--LAKEGR AKSVIALKEA FQDIAR---- -----  
----- GYLEEAETWN SG-YVA---S FPEYMKNGLV TSAYNVISKS ALVGMGEM--  
-VSEDALAWY ESH---PKTL QASELISRLQ DDVMTYQFER -ER-GQSATG VDSYIKTYGV  
-SEKEAIDEL NKMIENAWKD INEGCLKP-- -REVSMM--DL LAPILNLARM IDVVY--RYD  
-DG-FTFPGK -TMKEYITLL FVGSSPM--- -----*  
>P1;6W_HELAN
```

Length = 775

```
-----  
MAAVGASATL LTNTKSAEEP VRPVANFPPS VWGDLFLSFS LDNSMEE-- -Y--AEAMEE  
PKGQVRKLIL DPTMDSNK-- -----K LSLIYTVHRL GLTYMFFKEI EGQLDRLFKE  
FN----- LEDYVEVDLY TISTNFQAFR HLGKYL--SC DV--FN-KFK NYDSNTFKES  
ITS----- ---DVRGMLG LYESAQLRLK GE--KILDEA SAFTETKLKS LV-----  
KTLEGSQAQQ VKQSL-KRPF HQGMPMVEAR LYFS-NYQEE CSRHDS---- -----LLK  
LAKLHFNYLQ LQOKEELRIV SQWWKDMRF- QETT-PYIRD RVPEIYLWIL G-LYFEPRYS  
LARIATKIT LFLVVLDDTY DAYATIEEVR LLTDAINRWD --IG-AMSQI P-EYIRPFYK  
ILLDEYAELE KQ--LAKEGR ANSVIASKEA FQDIAR---- -----  
----- GYLEEAETWN SG-YVA---S FPEYMKNGLI TSAYNVISKS ALVGMGEI--  
-VSEDALAWY ESH---PQIL QASELISRLQ DDVMTYQFER -ER-GQSATG VDAYIKTYGV  
-SEKEAIDEL KKMIENAWKE INEGCLKP-- -REVSMM--DL LAPILNLARM IDVVY--RYD  
-DG-FTFPGK -TLKEYITLL FVGSSPM--- -----*  
>P1;Z6_HELAN
```

Length = 775

```
-----  
MAAVGASATP LTNTKSTAEP VRPVANFPPS VWGDLFLSFS LDKSIMEE-- -Y--AEAMEE  
PKEQVRLIL DPTMDSNK-- -----K LSLIYTVHRL GLTYMFLKEI EAQLDRLFKE  
FN----- LEDYVELDLY TISINFQAFR HLGKYL--PC DV--FN-KFK NDDSTTFKES  
ITG----- ---DVRGMLG LYESAQLRLK GE--NILDEA SAFAETKLKS LV-----  
NTLEGSQAQQ VKQSL-RRPF HQGMPMVEAR LYFS-NYQEE CSAHDS---- -----ILK  
LAKLHFNYLQ LQOKEELRIV SQWWKDMRF- QETT-PYIRD RVPEIYLWIL G-LYFEPRYS  
LARIATKIT LFLVVLDDTY DAYATIEEIR LLTDAINRWD --IS-AMNQI P-EYIRPFYK
```

ILLDEYAELE KQ--LAKEGR ANSVIASKEA FQDIAR-----  
----- GYLEEAEWTN SG-YVA---S FPEYMKNGLI TSAYNVISKS ALVGMGEI--  
-VSEDALVWY ESH---PQIL QASELISRLQ DDVMTYQFER -ER-GQSATG VDSYIKTYGV  
-SEKVAIDEL KKMIEAWKE INEGCLKP-- -REVSM--DL LAPILNLARM IDVVY--RYD  
-DG-FTFPGK -TLKEYITLL FVGSSPM--- ----- \*

>P1;U3\_CICIN

Length = 775

-----M ALVRNNSNG REPVLSPRSL  
TSPRGLTSPR PLSVQPTPEP VRPLANFPPS IWADRIFISFS LDNSQLEA-- -Y--ANALEE  
PKEAVKSLIT DTTIDANT-- -----K LKLIYSVHRL GLSYLYPDEI DAELNKLFEK  
ID----- LOYYEQVDLY TIAVQFQVFR HHGYKI--SS DV--FK-KFK DSTTGTFTDD  
VTK----- ---DVKGMLS LYESAHLRLH GE--DILDEA LAFTEAHLKK IL-----  
TTLEGDLARQ VNQVL-KRPF HTGMPMVEAR LYFI-THEED FSSHES---- -----VVK  
LAKVHFNYLQ LOQKEELRLV SQWWKDMQF- QOSV-PYIRD RVPEIYLWIL G-LYFEPYYS  
RARIATKIT LFLVVLDDTY DAYATIDEIR SITDAINRWE --IS-AIDQL P-EYIKPFYR  
ILLNEYDDLE KE--YSKDGR AFSVHASKQA FQEIAR-----  
----- GYLEEAEWLH NG-YVA---T FPEYMKNGLI TSAYNVISKS ALVGMGAI--  
-ADEEALAWY ETH---PKIL KASELISRLQ DDVMTFQFER -KR-GQSATG VDAYIKEYNV  
-SEEVAIKEL MKMIENAWKD INEGCLKP-- -TEVSV--AL LTPILNLARM IDVVY--KFD  
-DG-FTFPGK -TLKDYITLL FVSPPPSLEN ----- \*

>P1;Q6\_9ASTR

Length = 775

-----M ALVRNNSING REPVLSPRSL  
TSPRGLTSPR PLAVQPTPEP VRPLANFPPS IWANRFISFS LDNSELEA-- -Y--ANAHEE  
PKESVRSKIT DTTIDASA-- -----K LKLIYSVHRL GLSYLYPEEI DAELDQLFKK  
ID----- LHYYEQVDLY TISVQFQVFR HHGYKL--SS DI--FK-KFK DTTTGTFTDE  
VTK----- ---DVKGMLS LYESAHLRLH GE--EILDEA LVFTEAQLKK IV-----  
STLEGDLANQ VNQVL-KRPF HTGMPMVEAR LYFN-THEED VSCYES---- -----IVK  
LAKVHFNYLQ LOQKEELRIV SQWWKDMEF- QTSV-PYIRD RVPEIYLWIL G-LYFEPYYS  
RARIATKIT LFLVVLDDTY DAYATIDEIR AITDAINRWE --MS-AIDLL P-EYIKPFYR  
ILLNEYDDLE KE--YSKDGR AFSVHASKQA FQEIAR-----  
----- GYLEEAEWLH NG-YVA---T FPEYMKNGLI TSAYNVISKS ALVGMGAI--  
-ADEEALAWY ETH---PKIL KASELISRLQ DDVMTFQFER -KR-GQSATG VDAYIKEYNV  
-SEEVAIKDL MKMIENAWKD INEGCLKP-- -TEVSV--AL LTPILNLARM IDVVY--KFD  
-DG-FTFPGK -TLKDYITLL FVTPAPSLES C----- \*

>P1;7D\_9ASTR

Length = 775

-----  
MAMVDANTTT VQOGETKTTI VRPIAKFPPS LWGDRFLSFD LDNLELDD-- -CV-AAMK-E

PSDEIQRLIV DPDMDSNE-- -----K LRLINCVCRL GLSYLFIKDI ECQLEKLFKE  
LN----- MEEYNEFDLY TTSVNFLVFR QHGYKL--SC DV--FN-KFK DVSTGKFKEH  
ITS----- ---DVKGMLS FYECTHLGIR GE--SILDEA LAFTESYLKG VV-----  
DTLEGTLAQQ VKOGL-KFPC QRGLPIVEAR LYFS-NYEQE CSAYDP---- -----LPK  
LAKAHFSYFQ LMQKDELSKL TOWSKDMNF- QTIA-TYTRD KMPELYLWVL A-VFLEPRHV  
EARFITTKVA QLVVLVDDTF DAYATIEELR LLTDAISRWE --IS-CMEQL P-EYIKPFYQ  
IILNEYAEWE KQ--LAKEGR ENVVYASKKA FQELAR---- -----  
----- AYLREAERH SG-TVP---S FQEYYENGLA TSTYNLLGKS CLIGMGKI--  
-VDEEALAWY DSH---PKIL EASELIARLH NDVVSFEFER -ER-EHRATG IDAYMKTFGV  
-TEDVAVKEL KEMIENAWKD INEGCLKP-- -TKVSM--DL LYPIVNLSRV IYVAY--RFN  
-DG-FTFSDL -TLKDYISLL FEASVPV--- -----\*  
>P1;RK\_ARATH

Length = 775

-----  
-----MGSEV NRPLADFPAN IWEDPLTSFS KSDLGTET-- -F--KEKHST  
LKEAVKEAFM SSKANPIE-- -----N IKFIDALCRL GVSYHFEDI VEQLDKSFDC  
LDFPQ----- MVRQEGCDLY TVGIIFQVFR QFGFKL--SA DV--FE-KFK DENGKFKGHL  
VT----- ---DAYGMLS LYEAAQWGTH GE--DIIDEA LAFSRSHLEE IS-----  
SRSSPHLAIR IKNAL-KHPY HKGISRIETR QYIS-YYEEE ESCDPT---- -----LLE  
FAKIDFNLLQ ILHREELACV TRWHHEMEF- KSKV-TYTRH RITEAYLWSL G-TYFEPQYS  
QARVITTMAL ILFTALDDMY DAYGTMEELE LFTDAMDEWL PVVP-DEIPI P-DSMKFIYN  
VTVEFYDKLD EE--LEKEGR SGC GFHLKKS LQKTAN---- -----  
----- GYMQEAKWLK KD-YIA---T FDEYKENAIL SSGYALIAM TFVRMTDV--  
-AKLDAFEWL SSH---PKIR VASEIISRFT DDISSYEFEH -KR-EHVATG IDCYMQQFGV  
-SKERAVEVM GNIVSDAWKD LNQELMRP-- -HVFPF--PL LMRVLNLSRV IDVFY--RYQ  
-DA-YTNP-K -LLKEHIVSL LIETIPI--- -----\*