Supplementary Materials Experimental Evidence and In Silico Identification of Tryptophan Decarboxylase in *Citrus* Genus

Luigi De Masi, Domenico Castaldo, Domenico Pignone, Luigi Servillo and Angelo Facchiano

Table S1. The 12 deduced protein sequences of clementine (*C. clementina*), retrieved from Phytozome v10 database for producing significant alignments vs. *C. roseus* TDC protein of 500 aa residues, are reported with source parameters.

Sequence Code	Score (Bits)	E Value	Identity	Length	Phytozome Annotation
Ciclev10014992m	702.6	0	68.0%	499	Tyrosine decarboxylase
Ciclev10018100m	601.3	0	55.4%	506	Tyrosine decarboxylase
Ciclev10000723m	595.9	0	56.2%	567	Tyrosine decarboxylase
Ciclev10033968m	590.5	0	56.6%	501	Tyrosine decarboxylase
Ciclev10031252m	578.9	0	55.1%	517	Tyrosine decarboxylase
Cialor 10019201m	E67 0	0	E2 29/	E10	Aromatic amino acid
Ciclev10018501III	367.0	0	33.2%	519	decarboxylase (PANTHER)
Ciclou 10025250m	549 1	0	52 20/	502	Aromatic amino acid
CICIEV 10025559III	346.1	0	33.3%	525	decarboxylase (PANTHER)
Ci al an 1002E447m	E09.4	0.0 × 1.0-176	E0.99/	100	Aromatic amino acid
Ciclev 10025447m	508.4	8.8 × 10 1/0	50.8%	498	decarboxylase (PANTHER)
Ciclev10020518m	439.1	3.5×10^{-150}	53.2%	391	Tyrosine decarboxylase
Ciclour10025780m	424.1	2.2×10^{-144}	E1 09/	205	Aromatic amino acid
Ciclev 1002578911	424.1	2.5 × 10 14	51.0%	393	decarboxylase (PANTHER)
Ciclor:10027405m	205.2	1.0×10^{-132}	10 70/	422	Aromatic amino acid
Ciclev 1002/405in	393.2	1.9 × 10 102	40.7 %	432	decarboxylase (PANTHER)
Cialar-10021E((m 1	25.4	<u> </u>	25.20/	120	Sphingosine phosphate lyase
CICIEV10031500M 1	35.4	0.0 × 10 -	23.3%	438	(PANTHER)

¹The BLAST parameters for this sequence suggest to consider it not significant.

Table S2. The 11 deduced protein sequences of sweet orange (*C. sinensis*), retrieved from Phytozome v10 database and producing significant alignments vs. *C. roseus* TDC protein of 500 aa residues, are reported with source parameters.

Sequence Code	Score (Bits)	E Value	Identity	Length	Phytozome Annotation
orange1.1g010842m	703.4	0	68.0%	499	Aromatic amino acid
					Aromatic amino acid
orange1.1g038818m	595.1	0	56.7%	486	decarboxylase (PANTHER)
orange1 1g010125m	578.9	0	55.1%	517	Aromatic amino acid
orange1.1g01012511	576.9	0	55.170	517	decarboxylase (PANTHER)
orongo1 1g0/86/2m	570.1	0	55 /0/	506	Aromatic amino acid
01alige1.1g040045111	570.1	0	55.470	500	decarboxylase (PANTHER)
$a_{12} = 2000 = 100000000000000000000000000000$	E() 8	0	E 4 70/	502	Aromatic amino acid
orange1.1g03/144m	562.8	0	54.7%	502	decarboxylase (PANTHER)
orange1.1g041829m	545.0	0	53.5%	486	Tyrosine decarboxylase
	207.1	2.0×10^{-134}	F(20/	255	Aromatic amino acid
orange1.1g048019m	397.1	3.9 × 10 104	36.3%	300	decarboxylase (PANTHER)
	220.7	1.4×10^{-108}	F1 10/	210	Aromatic amino acid
orange1.1g046506m	329.7	1.4×10^{-100}	51.1%	310	decarboxylase (PANTHER)



Figure S1. Workflow for TDC annotation in *Citrus* based on genomic screening and bioinformatics approach. In grey it is reported what is the result of the previous action and the input for the following one. pAADC (putative Aromatic L-Amino Acid Decarboxylases).

	1 10) 20	30	o 40	50	60	n 70) 80	90	100	110
TDC1 Actaea racemosa TDC2 Actaea racemosa partial TDC Actaea racemosa TDC1 Camptotheca acuminata TDC2 Capsicum annuum TDC2 Capsicum annuum TDC2 Capsicum annuum TDC2 Capsicum annuum TDC Catharanthus roseus TDC Mitragyna speciosa TDC Ophiorthira prostrata TDC Ophiorthira prostrata TDC Rauvolfia vorticiilata TDC Tabernaemontana elegans TDC Vinca minor	MGSLDSNY-D MGSLDSNY-D MGSLDSNY-D MGSLDSNY-D MGSLDSNN-S MGSLDSNN-S MGSLDSTN-V MGSLSENCDD MGSLSENCD MGSLSEND-V MGSLDSTN-V MGSLDSTN-V		RNDIDLEELR RNDIDLEERR RNDIDEERR RNDIDEERR RNDIDEERR RNDIDEERR RNDIDEERR RNDIDEERR RNDIDEERR RNDIDEERR RNDIDEERR RNDIDEERR RNDIDEERR RNDIDEERR RNDIDEERR	KQAVQTVDFI KQAVQTVDFI KQAVQTVDFI KQAHQTVDFI KQAHQTVDFI TQAHQXVDFI TQAHQXVDFI KQAHIXVDFI KQAHIXVDFI KQAHIXVDFI KQAHIXVDFI KQAHIXVDFI KQAHIXVDFI KQAHIXVDFI	VDYYKN ESY VDYYKN ESY VDYYKN ESY ADYYKN ESY ADYYKN ESY ADYYKN ESY ADYYKN ESY ADYYKN ESY ADYYKN ENY ADYYKN ENY ADYYKN ESY ADYYKN ESY	PULSQVIPGY PULSQVIPGY PULSQVIPGY PULSQVIPGY PULSQVIPGY PULSQVIPGY PULSQVIPGY PULSQVIPGY PULSQVIPGY PULSQVIPGY PULSQVIPGY PULSQVIPGY PULSQVIPGY	LITCLESAP IRTCLESSAP IRTCLESSAP IRTCLESSAP IRTCLESSAP LITCLESSAP LITCLESSAP IRTCLESSAP IRTCLESSAP IRTCLESSAP IRTCLESSAP IRTCLESSAP IRTCLESSAP IRTCLESSAP	NKEPPETIL NKEPPETIL VREPPETIL VREPPESIL VIEPSLOTIM AHS ILONU VIEPSLOTIM VIEPSLOTIM VIEPSLOTIM VIEPSLOMI VIEPSLOMI VLESLOMI VLESLOMI	KDVQNV IPG KDVQNV IPG KDVQNV IPG KDVQKU IPG KDVQKU IPG KDVKKU IPG KDVKKU IPG CDICKD IPG CDICKD IPG CDICKD IPG DDICKD IPG DDICKD PPG DDICKD PPG DDICKD PFG	MTBMLSPNFE MTBMLSPNFE MTBMSPNFE MTBMSPNFE MTBMSPNFE MTBMSPNFE MTBMSPNFE MTBMSPNFE MTBMSPNFE MTBMSPNFE MTBMSPNFE MTBMSPNFE MTBMSPNFE MTBMSPNFE	AUPATVSSA AUPPATVSSA AUPPATVSSA AUPPATVSSA AUPPATVSSA AUPPATVSSA AUPPATVSSA AUPPATVSSA AUPPATVSSA AUPPATVSSA AUPPATVSSA AUPPATVSSA AUPPATVSSA
	120) 130	140) 150	1.60	170	180	19	. 200) 210	. 220
TDC1 Astas racemosa TDC2 Astas racemosa Dartial TDC Astas racemosa TDC2 Camptotheca asuminata TDC2 Camptotheca asuminata TDC2 Capsicum annuum TDC2 Capsicum annuum TDC2 Capsicum annuum TDC2 Capsicum annuum TDC Catharanthus roseus TDC Miragyna speciosa TDC Ophiorthira prostrata TDC Ophiorthira prostrata TDC Capsiculta verticillata TDC Tabernaemontana elegans TDC Vinca minor	AFIGEMUGTE AFIGEMUGTE AFIGEMUGTE AFIGEMUGTE AFIGEMUGTE AFIGEMUGTE AFIGEMUGTE AFIGEMUGTE AFIGEMUGTE AFIGEMUGTE AFIGEMUGTE AFIGEMUGTE AFIGEMUGTE AFIGEMUGTE	PINSUGTATIA PINSUGTATIA PINSUGTATIA PINSUGTATIA PINSUGTATIA PINSUGTATIA PINSUGTATIA PINSUGTATIA PINSUGTATIA PINSUGTATIA PINSUGTATIA PINSUGTATIA PINSUGTATIA	SPASTELESV SPASTELESV SPASTELESV SPASTELESV SPASTELEMI SPATELEMI SPATELEMI SPASTELEMI SPASTELEMI SPASTELEMI SPASTELEMI SPASTELEMI	WDWIARIA WDWIARIA WDWIARIA WDWIARIA WDWIARIA WDWIASSIA WDWIASSIA WDWIASSIA WDWIARIA WDWIARIA WDWIARIA WDWIARIA WDWIARIA WDWIARIA WDWIARIA	LPRSPNSDT LPRSPNSDT LPRSPNSDT LPRSPNSDT LPRSPNSGT LPRSPNSGT LPRSPNSGT LPRSPNSGT LPRSPNSGT LPRSPNSGT LPRSPNSGT LPRSPNSGT	GGGVTHGTTS GGGVTHGTTS GGGVTQGTTS GGGVTQGTTS GGGVTQGTTS GGGVTQGTTS GGGVTQGTTS GGGVTQGTTS GGGVTQGTTS GGGVTQMTTS GGGVTQMTTS GGGVTQMTTS	DALICTIVAS DALICTIVAS DALICTIVAS DALICTIVAS DALICTIAA DALICTIAA DALICTIAA DALICTIAA DALICTIAA DALICTIAA DSILCTIAA DSILCTIAA DSILCTIAA	RDRAINETICD RDRAINETICD RDRAINETICD RDRAINETICD SPHINEETICO RDRAINESIGW RDRKIENIGW RDRAINENG RDRAINENG RDRAINENG RDRAINENG RDRAINENG RDRAINENG RERAINENG RERAINENG RERAINENG RERAINENG RERAINENG RERAINENG RERAINENG RERAINENG	ENTARIOVIS ENTARIOVIS ENTARIOVIS ENTARIOVIS DESTRIVVIS DAISENVIS DAISENVIS ENTGRIVVIS ENTGRIVVIS ENTGRIVVIS ENTGRIVVIS DESTRIVVIS DESTRIVVIS DESTRIVVIS DESTRIVVIS DESTRIVVIS DESTRIVVIS DESTRIVVIS DESTRIVVIS DESTRIVVIS DESTRIVVIS DESTRIVVIS DESTRIVVIS DESTRIVVIS DESTRIVVIS DESTRIVVIS DESTRIVVIS DESTRIVVIS	SDQTHSTLAK SDQTHSTLVK SDQTHSTLVK SDQTHSTLVK SDQTHSTYAK SDQTHSTYAK SDQTHSTYAK SDQTHSFFQK SDQTHSFFVK SDQTHSFFVK SDQTHSFFVK SDQTHTMFPK SDQTHTMFPK	ACKIACIUR ACKIACIUR ACKIACIUR ACKIACIUR ACKIACIUR ACKIACIUR ACKIACIUR ACKIACIUR CALACIUR TOKIACIUR TOKIACIUR TOKIACIUR TOKIACIUR TOKIACIUR TOKIACIUR TOKIACIUR TOKIACIUR
	230	240	250	260	270	280) 29() 30() 31(320	330
TDC1 Actaes racemosa TDC2 Actaes racemosa Partial TDC Actaes racemosa TDC1 Camptotheca acuminata TDC2 Camptotheca acuminata TDC2 Capsicum annuum TDC2 Capsicum annuum TDC2 Capsicum annuum TDC Catharanthus rosens TDC Mitragyna speciosa TDC Ophiorrhisa prostrata TDC Ophiorrhisa prostrata TDC Rauvolfia verticilata TDC Tabernaemontana elegans TDC Vinca minor	NUMPERSKE NUMPERSKE NUMPERSKE NUMPERSKE NUMPERSKE NUMPERSKE NUMPERSKE NUMPERSKE NUMPERSKE NUMPERSKE NUMPERSKE NUMPERSKE NUMPERSKE NUMPERSKE NUMPERSKE	DIN ALS TING DIN ALS TING DIN ALS TING SNS VS LLI SNS VS LLI SNS VS LLI SNS VS LLI DIN SNS DA DIN SNS DA	RTTERAVEA QTTERAVEA QTTERAVEA RATERAVAA RRATERAVAA RETERAVAA RETERAVAA RETERAVAA REQTERAVAA REGTERAVAA REMUKAAVAA REMUKAAVAA	GLIDIVICAT GLIDIVICAT GLIDIVICAT GMUPHYICAT GLUDICAT GLUDICAT GLUDIFICAT GLUDIFICAT GLUDIFICAT GLUDIFICAT GLUDIFICAT GLUDIFICAT	Vertesnavd Vertesnavd Vertesnavd Vertesnavd Vertesnaid Vertestaid Vertestaid Vertestaid Vertestaid Vertestaid Vertestaid Vertestaid Vertestaid Vertestaid Vertestaid Vertestaid Vertestaid Vertestaid Vertestaid Vertestaid	EVGCIADVAN EVGCIADVAN ELSEADVAN ELSEADVAN ELSEADVAN ELDEGKIN EVDSISSIAN EVDSISSIAN EVSEVAKVAN EVSEVAKVAN EVSEVAKVAN EVSEVAKVAN EVSEVAKVAN EVSEVAKVAN EVSEVAKVAN	GFGVWVHVDA GFGVWVHVDA GFGVWVHVDA DYGVWFHVDA DYGVWFHVDA DYGVWFHVDA SNSIMFHVDA EFDIWLHVDA DFNIWVHVDA DFNIWVHVDA EFDIWLHVDA EFDIWLHVDA EFDIWLHVDA EFDIWLHVDA	AYAGSACICP AYAGSACICP AYAGSACICP AYAGSACICP AYAGSACICP AYAGSACICP AYAGSACICP AYAGSACICP AYAGSACICP AYAGSACICP AYAGSACICP AYAGSACICP AYAGSACICP AYAGSACICP AYAGSACICP	EFRHIDGIE EFRHIDGIE EFRHIDGIE EFRHIDGIE EFRUIDGIE EFRUIDGIE EFRUIDGIE EFRUIDGIE EFRUIDGIE EFRUIDGIE EFRUIDGIE EFRUIDGIE EFRUIDGIE	RVDSLSISPH RVDSLSISPH RVDSLSISPH RADSLSISPH RADSLSISPH RADSLSISPH RADSLSISPH RVDSLSISPH LVDSISISPH LVDSISISPH RVDSLSISPH RVDSLSISPH RVDSLSISPH RVDSLSISPH	KWLLTUDCC KWLLTUDCC KWLLSUDCC KWLSUDCC KWLSUDCC KWLLSUDCC KWLLCTDCC KWLLCTDCC KWLLCTDCC KWLLCTDCC KWLLCTDCC KWLLATDCT KWLLATDCT
	340	350	360	370	380	390	400	410	420	430	440
TDC1 Actaes racemosa TDC2 Actaes racemosa partial TDC Actaes racemosa TDC1 Camptotheca acuminata TDC2 Camptotheca acuminata TDC2 Capsicum annuum TDC2 Capsicum annuum TDC2 Capsicum annuum TDC Catharanthus roseus TDC Mitragyna speciosa TDC Ophiorthisa prostrata TDC Ophiorthisa prostrata TDC Paivolfia verticillata TDC Tabernaemontana elegans TDC Vinca minor	CLWVROLLI CLWVROLLI CLWVROLLI CLWVROLLI CLWVROLLI CLWVROLLI CLWVROLLI CLWVROLLI CLWVROLLI CLWVROLLI CLWVROLLI CLWVROLLI CLWVROLLI	TRUGCNEE TRUGCNEE TRUGCNEE TRUGCNEE TRUGCNEE TRUGCNEE TRUGCNEE TRUTSE TRUTSE TRUTSE TRUTTSE TRUTTSE TRUTTSE TRUTTSE TRUTTSE TRUE TRUE TRUE TRUE TRUE	IKREPTEINS IKREPTEINS IKREPTEINS IKREPSENS IRREASCHI IRREASCHI IRREASCHI IRREASCHI IRREASCHI IRRESEDG IRRESEDG IRRESEDG IRRESEDG IRRESEDG IRRESEDG IRRESEDG		YGREFALTEL YGREFALTEL YGREFALTEL TGREFKLIFL TGREFKLIFL TGREFKLIFL TGREFKLIFL TGREFKLIFL TGREFKLIFL TGREFKLIFL TGREFKLIFL TGREFKLIFL TGREFKLIFL TGREFKLIFL TGREFKLIFL TGREFKLIFL	PFVPRSYGVA MFVPRSYGVA MFVPRSYGVA MFVPRSYGVA MFVPRSYGVA MFVPRSYGVA MLIMRSYGVA MLWRCYEVE MLWRCYEVE MLWRSYGVS MLURRSYGVS MFILRSYGVA MLIIRSYGVA	NLCSHIRSDI NLCSHIRSDV NLCSHIRSDV NLCSHIRSDV NLCSHIRSDV NLCSHIRSDV NLCSHIRSDV NLCSHIRSDV NLCSHIRSDV NLCSHIRSDV NLCSHIRSDV NLCSHIRSDV NLCSHIRSDV	MADUTE GIV RMADUTE GIV MADUTE GIV MADUTE GIV MADUTE GIV OF REFERENCE OF REFERENCE O	KSDPRFPIVI KSDPRFPIV KSDPRFPIV NSDPRFPIV ACCOLONIC KSDPRFPIV KSDPRFPIV KSDPRFPIV KSDPRFPIV KSDPRFPIV KSDPRFPIVV RSDPRFPVVV	PROFALVOFR PROFALVOFR PROFALVOFR PROFALVOFR PROFALVOFR PRASAUVOFR PRASAUVOFR PRASAUVOFR PRASAUVOFR PRASAUVOFR PRASAUVOFR PRASAUVOFR PRASAUVOFR	TIJSDEYEP- TIJSDEYEP- TIJSDEYEP- TIJSDEYEP- TIJSDEYEP- TNPUKSYEP- TNPUKSYEP- TNPUKSYEP- TNPUKSYEP- TNPS-GGSME TNPGKGYDDE TNPGKGYDDE TKA-LFGSD- TKA-FFGSD-
	450	9 460	470) 480	490	500	510	3			
TDC1 Actaes racemosa TDC2 Actaes racemosa partial TDC Actaes racemosa TDC1 Camptotheca acuminata TDC1 Captotheca acuminata TDC2 Capsicum annuum TDC2 Catharanthus roseus TDC2 Gapsicum annuum TDC Catharanthus roseus TDC Ophiorrhira pumila TDC Ophiorrhira pumila TDC Abernaemontana elegans TDC Vinca minor	ELVELFNOD ELVELFNOD ELVELFNOD ELVELFNOD TGTSALIRKD ONTELLNRRD -YARKLHNN ADIELLNRRD -VERVNRR ADIELLNRR IDRSTLINRE VEALNRR VEALNRR	IDEVISCEM IDEVIS	YMTHTVIGGT YMTHTVIGGT YMTHTVIGGT YMTHTVIGGT YMTHTVIGGT YMTHTVAGGI YMTHTVAGGI YMTHTVAGGI YMTHTVAGGI YMTHTVAGGI YMTHTVGGI YMTHTVGGI YMTHTVGGI	VILEPAVGST VVLEPAVGST VVLEPAVGST VVLEPAVGST VVLEPAVGST VMLEPAVGAT 20LEPAVGAT VMLEPAVGAT VMLEPAVGSS VMLEPAVGT VMLEPAVGSS VMLEPAVGSS	ATKEH YAA ATKEH YAA ATKEH YAA ATKEH YAA ATKEH YAA ATKEH YAA ATKEH YAA ATKEH YAA FPEDR HI ICA I DEEH YAA I DEEH YAA I DEEH YAA I DEEH YAA I DEEH YAA I DEEH YAA I DEEH YAA	MUKETADM MUKETADM MUKET KUKEGADA KUREGADA KUREGADA KUREGADA KURECADA KURECADA MEUKECTDA MEUKECTDA MEUKELAND MEUKELAND	LIVERC LIVEC LLRNCQ LLRNCQ LLRNCQ LLRNCQ LLRRC SLKEA SLKEA	 RANPQ 			

Figure S2. Multiple sequence alignment for representative plant TDC enzymes. Residues identical or similar in at least 80% of the aligned sequences are shaded in black or grey, respectively; gaps introduced are represented by dashes. *C. annuum* TDC2 sequence is indicated in red color to evidence its divergence respect to remaining TDC.

TYDC1a Arabidopsis thaliana TYDC1b Arabidopsis thaliana TYDC1c Arabidopsis thaliana TYDC1c Arabidopsis thaliana TYDC1d Arabidopsis thaliana TYDC Aristolochia contorta TYDC Citrus reshni TYDC2 Papaver somniferum TYDC2 Papaver somniferum TYDC2 Papaver somniferum TYDC3 Petroselinum crispum TYDC4 Petroselinum crispum TYDC4 Petroselinum crispum TYDC4 Petroselinum crispum TYDC4 Petroselinum crispum

1	10	20	30	40	50	60	70	80	90	100	110
]] .					1
MFB	POHMYDREFO	TGNGYSNGN	GYTNGNGHTN	GNGNYNGNGI	IVNGNGKANG	AKVVKMKPMD.	SELLREQGHI	MVDFIADYYK	NLQDSPQDF	PVLSQVOPGY	IRDMI
MFB	VPQHMYDREF	TGNGYSNGN	GYTNGNGHTN	GNGNYNGNGH	IVNGNGKANG!	AKVVKMKPMD	SELLREQGHI	MVDFIADYYK	NLQDSPQDF	PVILSQVOPGY	TRDMI
				b	ENGSGKV	LKPMD	SEQLREYGHL	MVDFIADYYK	TIBDF	PVILSOVOPGY	HKL
				<u>N</u>	ENGSGKV	LKPMD	SEQLREYGHL	MVDFIADYYK	TIBDF	PVILSOVOPGY	HKL
				MGSI	NTEDVLENN	TAFGVTNPLE	PEEFRKOGHM	IIDFLADYYR	DIBKY	PVRSQVDPGY	TRKRI
				MGSI	HVED-LDNIS	SKCTVENPLD	PEEFRROGHM	MIDFLADYYR	DVIJKY	PVRSQVDPGY	TRKRU
				MGSI	TSDPELKYN	-SGSFTNPLD	SEEFRROGHM	IIDFIADYYK	NVOKY	PVRSQVDPGY	I OKVI
				MGSI	TSDPELKYN	-SGSFTNPLD	SEEFRROGHM	IIDFIADYYK	NVIJKY	PVRSQVDPG1	I ORVI
				MGSI	TSDPELKYN	SGSFTNPLD	SEEFRROGHM	IIDFIADYYK	NV¤KY	PVRSQV [®] PGY	OKVI
				MGSI	TSDPELKYN	SGSFTNPLD	SEEFRROGHM	IIDFIADYYK	NV9KY	PVRSQV®PGY	IOKVI
				MGSI	TSDPELKYN	-SGSFTNPLD	SEEFRROGHM	IIDFIADYYK	NVDKY	PVRSQVDPGY	IOKVI
MVI	LQIWCLTHDSE	KKLGGGYLL	FPVIKVAYTV	HTLTEWCCVT	EEGGGSE	LKAMD	AEQLREOGHM	MVDFIADYYK	TIONF	PVILSQVOPGY	IGKLI
		М	IAILSLTFST	PTFSN	EEGGGSE	LKAMD	AEQLREOGHM	MVDFIADYYK	TIONF	PVILSQVOPGY	GKL
				MGSI	PANN-FESMS	SLCS-QNPLD	PDEFRROGHM	IIDFLADYYK	NVDKY	PVRHQVDPGY	TKKR
				MGSI	NTEDVLENSS	SAFGVTNPLD	PEEFRROGHM	IIDFLADYYR	DVokY	PVRSQVDPGY	RKR
				MGSI	NTEDVLEHSS	SAFGATNPLD	PEEFRROGHM	IIDFLADYYR	DV KY	PVRSQVDPGY	TRKRU
				MGSI	PTDN-LESMS	SICS-QNPLD	PDEFRROGHM	IIDFLADYYK	NVKVS	-SRSOANPG-	SOOTI
				MGSI	PANN-FESMS	SLCS-QNPLD	PDEFRROGHM	IIDFLADYYK	NVOKY	PVRSQVDPGY	KKR
				MGSI	NTEDVLENSS	SAFGVTNPLD	PEEFRROGHM	IIDFLADYYR	DV KY	PVRSQV PGY	URKRI
				MGSI	PTNN-LESMS	SPCS-QNPLD	PDEFRROGHM	IIDFLADYYK	NV KY	PVRSQVPPGY	KKR
				MGSI	PTNN-LESIS	SLCS-QNPLD	PDEFRROGHM	IIDFLADYYK	NVIDNY	PVRSQVDPGY	TKKRI
							EFRROGHL	MIDFLADYYR	KVIONY	PVRSQVSPGY	IREIL
				MGSI	DNLT-EKLAS	S-QFPMNTLE	PEEFRROGHM	MIDELADYYR	KVIDNY	PVRSQVSPGY	IREIL
				MGSI	DNLTAQKLTS	SSQFPMNTLE	PEEFRROGHL	MIDELADYYR	KVIDNY	PVRSQVSPGY	IREIL
				MGSI	DNLMAQKLTS	-OFPMNTLE	PEEFRROGHL	MIDFLADYYR	KVIDNY	PVRSQVSPGY	REI
				MGTI	NINHELDDQ	-IFNTINPLD	PEEFRROGHK	IVNFLADYYO	итьбй	PVCSQVNPGY	QKIV
				MGSI	HVED-LDNIS	SKCTVENPLD	PEEFRROGHM	MIDELADYYR	DIDKY	PVRSQVEPGY	RKEI
MSPFHTLY	KSDGLASER	DIAEATTFLF:	LVASTSQESE	NLVSGEMGSI	ESIVNLENN	SSDIVNPLN	PDEFRRQGHM	IIDFLADYYQ	NIOKY	PVLSQVEPGY	RKL

TYDC1a Arabidopsis thaliana	PDS
TYDC1b Arabidopsis thaliana	PDS
TYDC1c Arabidopsis thaliana	PDS
TYDC1d Arabidopsis thaliana	PDS
TYDC Argemone mexicana	PET
TYDC Aristolochia contorta	PES
TYDC Citrus aurantium	PES
TYDC1 Citrus reshni	₽⊡S
TYDC2 Citrus reshni	PDS
TYDC Citrus reticulata	PES
TYDC Citrus sinensis	PDS
TYDC1 Medicago truncatula	PDS
TYDC2 Medicago truncatula	PDS
TYDC1 Papaver somniferum	PDS
TYDC2 Papaver somniferum	PET
TYDC3 Papaver somniferum	PET
TYDC5 Papaver somniferum	PET
TYDC6 Papaver somniferum	\mathbf{PDS}
TYDC7 Papaver somniferum	PET
TYDC8 Papaver somniferum	₽⊡S
TYDC9 Papaver somniferum	PDS
TYDC1 Petroselinum crispum	PDS
TYDC2 Petroselinum crispum	PDS
TYDC3 Petroselinum crispum	PDS
TYDC4 Petroselinum crispum	₽⊡S
TYDC Solanum tuberosum	BNS
TYDC Thalictrum flavum	PDS
TYDC Theobroma cacao	PMS

	120	130	140	150	160	170	180	190	200	210	220
.	· · <u>· · · · · ·</u>	<u></u>	<u>. </u>		· · · · · · · ·	· · · · · · · ·	<u></u> .		<u></u>	· · · · · <u>· · ·</u>	
AP	ERPESIKEL	LDDVSKKIM	PGITHWQSPSYI	YAYYASSTSV#	GELGEMINAC	LSVVGETWLT	SPAATEIDII	IVIDWLAKII	DHEDSTGN	666	/IQGTG
SAP	ERDOSLKEL	IDDWSKKIM	PGITHWQSPSYI	YAMYASSTSV:	GFLIGEMILNAC	LSVVGhTALT	SPAAmonoII	VLDWLAKLIK	DHOUSTGN	G(G(G)	TOGIIG
SAP	DHIDDTLDQV	IDDWRAKIIL	PGVTHWQSPSFI	24 YESNSSV:	GELGEMISAC	LGIVGBSMVT	SIDAAMOINDM	VLDWVAKLI	I DEEQIMSKGN	6666	IOCSA
SAP.	DHESTLDQV	LDDWRAKIL	PGVTHWQSPSFI	ATTESNSSV	GFLGEMILSAG	LGIVERSWVI	SPAANDINSM	VLDWVAKLD	NGEEQGMSKGN	G(G(G)	TOCSA
AP	YNDOGMESI	TODUORUUI	PGITHWQSPNMI	AIFPSSGSIA	AGPLGEMLSTG	FR VVGENWMS	SPAANDINDS	VMDWLGRMLE	KURKSE FSGN	GGG	TOGIT
	INSTREST	TODAOSHIV	PGITHWQSPNII	AIPPSSGST	AGF LGEMLSTG	PRVVGPNWMS	SPARTEILSI GDAAMELEN		CLERSINE SGS		TOCOT
AP	NNEDSMETT	LODVQQHIV	PGITHWQSPNII	AIPPSSGSIF	AGE LGEMESSG	IN IVGENALS	SPAATEILEN		UDK SIJIE SGN	666	
	NINDO SMETT		POTTNWOSPNIT	AVEDGGGGTZ	CFI CFML SC	DN TWCDMATS	SPARTELEN SDAATELEN	WADDL GOM R	CHARGE TESCH	666	TOCTT
AD			PGITTHWOSPNUL	AVEDSSCOT	GELGEMISSO	EN IVGENVIS	SPAATETEN		CHARSING SON		VTOGUT
2 2 10	NNESSMETT	TODVOOHUV	PGUTHWOSPNM	AVEDSSCST	GELGEMISSC	EN TWGDNA TS	SDAATETEN	WMDNL GOMU	THE SHIFT GN	666	VIOCTT
AP	THEFT	UNDVOEKUL	POUTHWOSPNM	AVEPSNSST	GELGEMLSAG	LSTVGDSATS	SPAATELED	WI DWI AKATT	TENDERSTOO	666	VIOCIA
AP	THESSLOHY	UNDVOEKUL	PGUTHWOSPNY	AVEPSNSSI	GFLGEMLSAG	LNIVGaSMIT	SPAATELET	MUDWLAKA	PDDESTGL	GGG	VIOGUA
AP	YNDDSIETI	LEDVINDII	PGUTHWOSPNY	AYFPSSGST	GFLGEMLS	ENVVGENMMS	SPAATDIADS	VMNALGOM	TRESIDESSD	GSSGGGG	VILOGTIT
AP	YN PDS IETI	LODVTTEII	PGLTHWOSPNY	AYFPSSGSVE	GFLGEMLSTG	FNVVGENWMS	SPAATEMES	/VMDWFGKMD1	LESSIFESGS	GGG	VLOGIS
AP	YNPESIETI	LODVISEII	PGLTHWQSPNY	AYFPSSGSVA	AGFLGEMLSTG	FNVVGENWMS	SPAANDINDG	VMDWFGKML	UPKSYLFSGT-		VLOGTT
AP	NHSESIETI	LODVQNDII	PGITHWQSPNY	AYFPSSGSVA	AGFLGEMLSSG	FNVVGFNWMS	SPAATEIES	IVMNNLGQMD	TERSELFSSD	DNAGSSCEE	VLQGTT
AP	YN <mark>PES</mark> IETI	LEDVINDI I	PGLTHWQSPNY	TAYFPSSGSIF	AGFLGEMLSTG	FNVVGENWMS	SPAATEIES	WMNWLGQMU	LIPKSFLFSSD	3SSG <mark>666</mark>	VIQGTT
AP	YN <mark>PES</mark> IETI	LQDVTTEII	PGITHWQSPNY	AYFPSS <mark>GSV</mark> F	AGFLGEMLSTG	FNVVGFNWMS	SPAATELES	IVMDWFGKMU	VLPESFLFSGT	GGGY	VILQGT S
AP	YNT <mark>DSIE</mark> TI	LEDVINDII	PGTTHWQSPNYI	AYFPSSGS17	AGFLGEMLSTG	FNVVGENMMS	SPAANDINDS	WMNNLGQMU	TURKSFUFSTD	SSSG <mark>GGG</mark>	VLQGTT
AP	YN <mark>PDS</mark> IETI	LEDVINDII	PGHTHWQSPNYI	AYFPSS <mark>G</mark> SI#	AGFLGEMLS <mark>T</mark> G	FN VVGFNWMS	SPAATIDIADS	WMNNLGQML	DEKSELFSSD	3886 <mark>666</mark>	VLQGT I
AP	yn <mark>pds</mark> leti	LQDVQTKII	PGITHWQSPNFI	TAYFPSSGST7	AGFLGEMLS <mark>T</mark> G	FNVVGFNWMV	SPAATEIDEN	/VTDWFGKML	PRSEFESGE	GGG	7IQGTT
SAP	YN POSLETI	LQDVQTKII	PGITHWQSPNFI	TAYFPSSCSTA	AGFLGEMLS TG	FNVVGBNWMV	SPAATDID	/VTDWFGKMLÇ	DEKSELFSGG	GGG	UQGT T
3AP	YNDDSLETI	IQDVQTKIII	PGITHWQSPNE	AYFPSSGST/	AGFLGEMLSTG	FNVVGDNAMV	SPAADDINDNY	/VTDWFGKMLQ	DURKSDUFSGG	GGG	ALQGTT
3AP	YNDDSLETI	IQDVQTKII	PGITHWQSPNE	AYFPSSGST7	AGFLGEMLSTG	FNVVGENMMV	SPAADDID	/VTDWFGKMLQ	DERSETESGG	GGG	VIQGTT
AP	NNSDELEKI	DRDVERDII	PGHTHWQSPNEI	AYFPSSGST7	GELGEMILSVG	FRVVGENNIS	SPANNDINES	VMDWFGKMU	TENCEFASG	GGG	LOGIT
SAP	YNDESIETI	DEDMHKQUI	PGITHWQSPNY	VAY DESSGSVE	GELGEMLSIG	FNVVGDNAMS	SIPATAVIDITAD	CMDMLGKM11	OF KSID FSGN	GGG	LOGUL
AP	TABPVEAT	LODWERHIII	PGITTHWQSPNY	VATEPSSGSV:	Ceran cera Vins Te	HIVNGHNWIS	SPATENCE	TANDMT GÖWITE	anaðkinn L.I.CU	666	11001 T

TYDC1a Arabidopsis thaliana
TYDC1b Arabidopsis thaliana
TYDC1c Arabidopsis thaliana
TYDC1d Arabidopsis thaliana
TYDC Argemone mexicana
TYDC Aristolochia contorta
TYDC Citrus aurantium
TYDC1 Citrus reshni
TYDC2 Citrus reshni
TYDC Citrus reticulata
TYDC Citrus sinensis
TYDC1 Medicago truncatula
TYDC2 Medicago truncatula
TYDC1 Papaver somniferum
TYDC2 Papaver somniferum
TYDC3 Papaver somniferum
TYDC5 Papaver somniferum
TYDC6 Fapaver somniferum
TYDC7 Papaver somniferum
TYDC8 Papaver somniferum
TYDC9 Papaver somniferum
TYDC1 Petroselinum crispum
TYDC2 Petroselinum crispum
TYDC3 Petroselinum crispum
TYDC4 Petroselinum crispum
TYDC Solanum tuberosum
TYDC Thalictrum flavum
TYDC Theobroma cacao

230	240	250	260	270	280	290	300	310	320	330
OFAVILVVVLAARDRII	KKVCKTLLPQ	LVVY <mark>GSDQTH</mark>	SSFR <u>KA</u> CLIG	GIHEENIRLLI	DSSTNYGM	PPESPEEARS	HDLAKEFIGF	FICATVGTTS:	AAVDELVP	GNTA
CEAVEVVVLAARDRII SPAVEVVLIAARDKVI	KKVCKTLLPQ RSVCKNALEK	LVVY <mark>G</mark> SDQTH LVVYSSDOTH	SSFRKACLIG SALOKACOIA	GIHEENIRLLI GIHPENORVL	ODSSTNYGM NDSSTNYA	PPESI EEAUS RPESI OEAVS	HDLAKGFIPF RDLEAGHIPF	FICATVGTTS: FLCANVGTTS:	AAVDPLVP TAVDPLAA	GNIA
SEAVEVVLIAARDKVI	RSVGKNALEK	LVVYSSDQTH	SALOKACOIA	GIHPENCRVL	TDSSTNYAL	RPESIQEAVS	RDLEAGLIPF	FLCANVGTTS:	TAVDELAA	IGKIA
CEAILCTLTAARDRAL	CEIGRGEIGR	LVVYGSDQTH	CALOKAAOIA	GIDPANFRAV	TARSDNFGM	SAAAIRAAVE	EDTARGLVPL	FVCATVGTTS:	TAVDPLGP	ICEVA
CEAILCTLTAARDRVI CEAILCTLTAARDRVI	NKIGRENISK NKIGRENISK	L I VYGSDQTH L I VYGSDQTH	CALQKAAQIV CALQKAAQIV	GIDVKNFRAI GIDVKNFRAI	GTKSSSYGU GTKSSSYGU	SPDSUMAQUN SPDSUMAQUN	SOVEVGLIPL SOVEVGLIPL	FLOADIGAMA FLOADIGAMA	TAVDELKP TAVDELKP	lCDVA LCDVA
CEAILCTLTAARDRVI CEAILCTLTAARDRVI	NKIGRENISK NKIGRENISK	LIVYGSDQTH LIVYGSDQTH	ALQKAAQIV ALQKAAQIV	GIDVKNFRAII GIDVKNFRAII	UTKSSSYGI UTKSSSYGI	SPDSIMAQIN SPDSIMAQIN	SDVEVGLIFL SDVEVGLIFL	FLCATIGTTA: FLCATIGTTA	TAVDPLKP	I CDVA
CEATLCTLTAARDRVI SEAVINVINAARDKTI	NKIGRENISK RTVGRSALPK	LIVYGSDOTH	CALOKAAOIV	GIDVKNFRAIJ GINPELOSIJJ	TKSSSIGI	SPDSLMAQIN SPDVUSEAUS	SDVEVGLIPL	FLCATIGTTA	TAVDELKP	LCDVA
SDAVLVVILAARDKII	RTVGRSALPK	LVIYASDQTH	SSLQKACOIG	GLNPELC:LL	DSSTSFAL	SSDVI SEATS	NDIASGLIPF	FLCATVGTTS:	TAVDPLPA	LAKVA
CEAILCTLTAARDRKI	NKIGRENINK	LVVYASDQTL LVVY <mark>G</mark> SDQTH	SALQKAAQTA CALQKAAQVA	GINPKNFLAI	GIFKENSFGI	SAATUREVIL	ADIESGIVEL EDIEAGLIPL	FUCPTVGTTS:	TAVDEIGP	I CEVA
CEAILCTLTAARDRKI CEAILCTLTASRDKMI	NKIGREHIGR NKIGRENINK	lvvygsdoth lvvyasdoth	CALQKAAQIA CALQKAAQIA	GINPKNFRAVI GINPKNFRAI	AFKANSFGI ASKATDFGI	AASTUREVIL SPQAILSTIL	EDIEAGLIRL ADIES <mark>GL</mark> VPL	FVCPTVGTTS: FLCATVGTTS:	TAVDPIGP TAVDPIGP	ICEVA LCEVA
CEAILCTLTAARDKMI CEAILCTLTAARDKKI	NKIGRENINK NKIGREHIGR	lvvy <mark>a</mark> sdoth lvvygsdoth	CALOKAAQIA CALOKAAOVA	GINPKNFRAI GINPKNYRAVI	ASKATNEGI MEKANSEGI	SPNSIQSTIL AAATI KEVIL	ADIESGIVEL EDIEAGUIEL	FLCATVGTTS: FVCPTVGTTS:	TAVDRIGP	ICAVA ICEVA
CEAILCTLTAARDKMI	NKIGRENINK	LVUYASDOTH	ALOKAACTA	GINPKNVRAI	USKATNFGI	SPNSLQSTIL	ADIESGIVEL	FLCATVGTTS:	TAVDPIGP	LCAVA
CEAILCTLVAARDKNI	RQHCMDNIGK	LVVIAS <u>NO</u> TH	SALQKAAKIA	GIDPKNFRAI	ASKS SNFKI	CPKRIESAIL	YDLQNGLIPL	YLCATVGTTS:	TTVDPLPA	LTEVA
CEAILCTLVAARDKNI CEAILCTLVAARDKNI	RQHGMDNIGK RQHGMDNIGK	LVVYCSDQTH LVVYCSDQTH	SALQKAAKIA SALQKAAKIA	GIDPKNFRAI GIDPKNFRAI	otkssnfoi Otkssnfki	CPKRIESAIL CPKRIESAIL	hdlqngi ifl Ydlqngi ifl	YLCATVGTAS. YLCATVGTAS:	STTVDELPA STTVDELPA	LTEVA
CEAILCTIVAARDKNI CEAMLCTIVAARDOMI	RQHCMDNIGK RKISRENFGN	LVVYCSDQTH LVVYASDQTH	S <mark>ALOKA</mark> AKIA FSIKKAAHIA	GIDPKNFRAII GIDPGNFRVII	TKSSNFKI TIKANEYTI	CPKRLESAIL CPKSLRLAIL	YDLQNGLIPL NDLKEGNVPL	YLCATVGTTS: FLCATIGTTA	TTVDPLPA	LTEVA LCEIA
CEAILCTLTAARDRMI CEAMLCTLTAARDOMI	NKIGRENICK SKIGRENIGK	LVVYGSDQTH LVVYGSDQTH	CALQKAAQIA SAVAKAAKIV	GIHPNNFRAVI GIDPKNFRAII	ATKANDYGI CANKSTSFGI	SASAIRSTIL SPESIRIAIT	EDIEAGIVPL KDVKTGLIPL	FLCATVGTTS: YLCATVGTTS	TAVDPIGP	I CKVA LCDVA

220

TYDC1a Arabidopsis thaliana TYDC1b Arabidopsis thaliana TYDC1c Arabidopsis thaliana TYDC1c Arabidopsis thaliana TYDC1d Arabidopsis thaliana TIDCIA Arabidopsis thaliana TYDCI Arabidopsis thaliana TYDC Argemone mexicana TYDC Aristolochia contorta TYDC Citrus reshni TYDCI Citrus reshni TYDCI Citrus sinensis TYDCI Madicago truncatula TYDC2 Madicago truncatula TYDC2 Madicago truncatula TYDC3 Papaver sommiferum TYDC3 Patroselinum crispum TYDC3 Patroselinum crispum TYDC4 Patroselinum crispum TYDC4 Petroselinum crispum TYDC4 Petroselinum crispum TYDC Solanum tuberosum TYDC Thalictrum flavum TYDC Theobroma cacao

	340	350	360	370	380	390	400	410	420	430	440
KYG	WILHVDAAYAG	NACICIDDYR	FIDCIDNAL	SINMNAHKY LF.	ANQTESP	MINIORYSPIDAU	KANDOYJEFI	VEVSKKDTV	VNYKDWQISI	SREESSING SLIKINM	VIRL
(KYG)	WIPHVDAAYAG	NACICPEYRK	(FIDGIENAL	DSFNMNAHKW <mark>LF</mark>	ANQTOSP	LWVKDRYSLIDAL	KINPEYLEF-	-KVSKKDTV	VNYKDWQISL	SRRFRSLKLWM	VLRLY
NSNGI NSNGI	-VHVDAAYAG WHVDAAYAG	SACICPEMRC	QYIDGVETAL QYIDGVETAL	DSENMNAHKWEL DSENMNAHKWEL	TNFDCSL TNFDCSL	LWWKDODSHTLAH LWWKDODSHTLAH	SINPEFLKN- SINPEFLKN-	-KASQANLV	ADAKDMÖILDI ADAKDMÖILDI	GRRIERS LKINM GRRIERS LKINM	VERLY VERLY
EYEN	WVHVDAAYAG	SACICPETRH	IFIDGVENAI	DSFSLNAHKWFF	TTLDCCC	Invikopsanvkai	STNPEYLEN	-KATESKQV	VDYKDWQIAL	SRRFR SMKLWM	VLRNY
REHGI SOFGI	WVHVDAAYAG WVHVDAAYAG	SACICPERRE	IFIDGVEEAL IFIDGVEGAL	DSESLNAHKWLF DSESLNAHKWEF	TILDECC	INWEDPGSI-VKAU INWEDPRAI-VSSI	STNDDYLRN STNDDYLKN	-KATESROV	VDYKDWQIAL VDYKDWQIAL	SRRIFRALKIWL SRRIFRSLKIWE	VIRSY VIRNY
QFGI	WVHVDAAYAG	SACICPEFRH	IFIDGVEGAI	DSFSLNAHKWFF	ATLDCCC	lwvkdpralvssi	STNPEYLKN	-KATESMHV	VDYKDWQITL	SRRSRSLKLWF	VIRNY
QFGI OFGI	WVHVDAAYAG WVHVDAAYAG	SACICPEERH	IFIDGVEGAL IFIDGVEGAL	DSFSLNAHKWFF. DSFSLNAHKWFF	ATLDCCC	INVKOPRATVSSI INVKOPRATVSSI	STNPEYLKN- STNPEYLKN-	-KATESMQV -KATESMOV	VDYKDWQITL VDYKDWQITL	SRRERSLKIMF SRRERSLKIMF	VIRNY VIRNY
QFG	WVHVDAAYAG	SACICPEFRH	IF I DGVEGAL	OSF <mark>SLNAHKWF</mark> F	ATLDCCC	LWVKDPRALVSSI	STNPEYLKN	-KATE SMQV	VDYKDWQITL	SRRFRSLKLWF	VIRNY
(PNN) RTNN	WPHVDAAYAG WPHVDAAYAG	SACICPEYRE	IF IDGVEEAL	DSIANMINAHKWIAL/ DSIANMINAHKWIAL/	TNFDCSV	MWKDRSAUIQSU MWKDRSAUIOSU	SINDELKN	-KASQENTV	IDYKDWQIPL IDYKDWQIPL	GRRIGRIS LIKIAWM GRRIGRIS LIKIAWM	VMRLY VMRLY
LHG	WVHIDAAYAG	SACICPEFR	IF I DGVEDAD	OSF <mark>SLNAHKWF</mark> F	TTLDCCC	LWVKDSDSILVKAL	STSPEYLKN	-KATDSKQV	IDYKDWQIAL	SRRFR SMKLWL	VLRSY
EYEN EYEN	WVHVDAAYAG WVHIDAAYAG	SACICPEERH	IFIDGVEDAL	DSESLNAHKWEF DSESLNAHKWEF	TTLDCCC	IMWKDPSAI/VKAI IMWKDPSSI/VKAI	SINPEYERN	-KATESROV -KATESROV	VDYKDWQIAL VDYKDWOIAL	SRRERSLKINM	VLRSY VLRSY
QFG	WVHVDAAYAG	SACICPEFRH	IFIDGVE <mark>E</mark> AI	DSESLNAHKWEF	TTLDCCC	147VKDSNAI VKAL	STSPEYLKN	-KATDSKQV	IDYKDWQIAL	SRRFR SMKLWL	VLRSY
CLHGI SEYEN	WVHIDAAYAG WVHVDAAYAG	SACICEE FRH SACICEE FRH	IFIDGVEDAL IFIDGVEFAT	DSESLNAHKWEF DSESLNAHKWEF	TTLDCCC TTLDCCC	IMVKDSDSIVKAI IMVKDSSAIVKAI	STSPEYLKN- STNPRYLRN-	-KATDSKQV	IDYKDWQIAL MDYKDWQIAL	SRRFR SMKIWL SRRFR SLKIWM	VLRSY VLRSY
LYGI	WVHIDAYAG	SACICPEFRH	IFIDGVEDAD	DSESLNAHKWEF	TTLDCCC	100VKDSDSI VKAL	STSPEYLKN	-KATDSKQV	IDYKDWQIVL	SRRFRSMKLWL	VILRSY
(LYG)	WVHIDAAYAG WVHVDAAYAG	SACICPEERH	IFIDGVEDAL	DSFSLNAHKWFF DSFSLNAHKWFT	TTLDCCC	IMWKDSDSHVKAI IMWRDPSAILTKSI	STSAEYLKN STYPERTKN	-KATESKQV	IDYKDWQIAL MDYKDWQIAL	SRRFRSMKIWI SRRFRALKIWE	VERSY
KYDI	WVHVDAAYAG	SACICPEFRC	QYLDGVENAL	DSFSLNAHKWFL	TTLDCCC	LWVRNPSALIKSI	STYPEFLKN	-NASETNKV	VDYKDWQIML	SRRFRALKINF	VLRSY
KYDI	WVHVDAAYAG	SACICPEERC	YLDGVENAL	DSESLNAHKWEL DSESLNAHKWEL	TTLDCCC	IMVRDPSADIKSI IMVRDPSADIKSI	STYPERLKN-	-NASETNKV	VDYKDWQIML	SRRFRALKIWF SRRFRALKIWF	VLRSY
EFG	WVHVDAAYAG	SACICPEFQV	FLDGVENAN	SESLNAHKWEF	STLDCCC	LWVKDPSAILTNAL	SINPECLEN	-KATELNQV	IDYKDWQIAL	SRRFRALKIWL	VLRSY
SDYSI	WVHVDAAYAG	SACICPEER	IFIDGVENAL	SESLNAHKWEF	TTLDCCC	LWVKEPSAI IKAL	STNPEYLRN STNPEYLKN	-KATESHOV	VDYKDWQIAL	SRRFRAMKIWI SPRFRAMKIWI	VLRSY
	450	460	470	480	490	500	510	520	530	540	550
SEN	RNJIRDIMNL	AKHIDDYVAÇ	DPS DOVT	RY SLVCFRLA	DVDGD			EDQC	ERNRE	NSTEKIFISUT	ALSCK
SEN	RNFIRDHVNL	AKHOPDYVAÇ	DPSBDVVT	RYESLVORRLA	PVDGD			EDQC	ERNRELLAAV	NSTGKIFISHT	ALSCK
SET	KSYIRNHIKL	AKEFEQLVSC	DPN95IVT	RIFALVCERLV	EVKDE			EKKC	NRNRELLDAV	NSSCKLFMSHT	ALSCK
VAN	RNFLRSHVKM	AKORDCLIAS	DNREEICVE	RTEAMVOERLL	PPKSTRD	NRVREEDGLFVSG	VHDHENNINE	DDHLLVVAN	KLNOIYLEKV	NATGSLYMTHA	VVGGI
VAN	RHFLRSHVNM	AKLEPRIVSG	DKREEIVFE	CHEAVVOERVS	PSPVL	M	DKLKTKYVNO	LLSEEEQIN	EFNRELLESI	NASGKAYMTHA	VLGCI
VAN	RHFLRSHVNM	AKLEDRIVSC	DKREEIVEE	CHEAVVCERVS	PSPVL	M	DKLKTKYVNO	LLSEGEQIN	EFNRELLESI	NASCKAYMTHA	VLGGI
VAN	RHFLRSHVNM	AKLEERIVSG	DKREEIVEI	CHEAVVCERVS	ESPVL	M	DKLKTKYVNO	LISEEEQIN	EFNRELLESI	NASCKAIMTIA	VLGGI
eVAN	RHFLRSHVNM	AKLFERLVSG	DKRFEIVFI	CHEAVVCERVS	PSPVL	M	DKLKTKYVNO	LLSEEEQIN	EFNRELLESI	NASGKAYMTHA	VLGGI
LEG	RTHIRSHIAL	AYDELVCC	DTREKVVA	RTESLVCERLL	EPPNS			EDNG	KLNHDI DAV	NSTGNVFITHT	VLSCE
TAN	RTELRSHVKM	AKHINQGU I GM	IDNREEIVVE	RTHAMVORRLK	PAAIF		RKKIVED	-DHIEAQTN	EVNAKITESV	NASGKIYMTHA	vvggv
VIN	RNFLRSHVRM	AKTEDGUVGA	DGREEITV ADRREEITV	RTHAMVCHRLL	PPRTI PPTTV	-KVCGENGVHQNG	NGVVPLR-DE NGVIAVLRNE	NEE-LVLA	KLNOVYLROV	KATGSVIMILA KATGSVIMILA	VVGGV
evani	RSFIRSHVKM	AKHEDGUIAM	IDKREETVVE	NTFAMVCERLK	PAAIF		NGKLGENGVI	YNCIEEKTN	EINSKULESV	NASGSIYMTHA	vvgev
CIAN TNU	RIFLRSHVKE	AKTEDGU I GM	IDNREE IVVE IDGREE I TVE	RTHAMVORRLK	DPTTI	-KVY-DNGVHQNG	NGVVAVH-NE	NET-LLLAN	EVRAKILLESV KLNOVYLETV	natgsvymtha	VVGEV
evan	RTFLRSHVKM	AKLEOGLIVM	IDNIFEIVVE	RTEAMVOERLK	PAAIF		RKKIVED	-DHIEAQTN	EVNAKILESV	NASGKIYM	
evani evgqi	REFIRGHVGM	AKY REGIVGM	IDNREDIVA IDNREDVAL	RIDAMVODRLK RLDSMVCDRIK	PAAIF PSAMI		-GKNDED	-DYIEDQTN	EVICAKIJIESV EINRKLLESV	NDS	VGCV
vgqi	REFIRGHVGM	AKY EDGI VNM	IDKREEVVA	RLESMVCERIK	PSAMI		-GKNDED	EVN	EINRKUTESV	NDSGRIYVSHT	VLGGI
evgoj evgoj	REFIRGHVGM REFIRGHVGM	AKYEDGIVGI AKYEDGIVGI	DKREEVVAL	RLFSMVCFRIK RLFSMVCFRIK	PSAMI PSAMI		-GKNDEN	EVN	EINRKIJESV EINRKLIESV	NDSGRIYVSHI NDSGRIYVSHIT	VLGCI VLGCI
VIN	RNLIRSHVNM	AKHEDGUVAI	DKREE I FVI	RKFAMVCERIS	ELVLS	Q	VSTKFDD	EKEVN	MENTKLVESI	NSCGKLYLTHG	VVGCT
	RNGLRSHVKM	ANNODGFIAI AKRODETLAS	JOKRODIVVE SONREDVVVE	RIBAMVOBRLL RYBATVOBRVL	PPRSP	LIIKTNGYQNG	NGVYHKD TONEPCGKAI	HIVHORHAN	EDARRIGESI EDARKINEST	NASCSAYMTHS NASCHMYMTHA	MVGGV OVECI
en al la serie de	the second s			the second se			The second second		and the second second second	the second s	~

TYDC1a Arabidopsis thaliana TYDC1b Arabidopsis thaliana TYDC1c Arabidopsis thaliana TYDC1c Arabidopsis thaliana TYDC Aristolochia contorta TYDC Aristolochia contorta TYDC Citrus reshni TYDC2 Medicago truncatula TYDC2 Medicago truncatula TYDC2 Medicago truncatula TYDC2 Medicago truncatula TYDC2 Papaver somniferum TYDC3 Papaver somniferum TYDC3 Papaver somniferum TYDC5 Papaver somniferum TYDC3 Petroselinum crispum TYDC3 Petroselinum crispum TYDC3 Petroselinum crispum TYDC4 Petroselinum crispum TYDC Solanum tuberosum TYDC Thalictrum flavum TYDC Theobroma cacao

TYDCla Arabidopsis thaliana TYDClb Arabidopsis thaliana TYDClc Arabidopsis thaliana TYDCld Arabidopsis thaliana TYDC Argemone mexicana TYDC Aristolochia contorta TYDC Aristolochia contorta TYDC Aristolochia contorta TYDC Citrus autantium TYDCC Citrus reshni TYDC Citrus reshni TYDC Citrus reioulata TYDC Citrus sinensis TYDC Medicago truncatula TYDC2 Medicago truncatula TYDC2 Papaver sommiferum TYDC3 Papaver sommiferum TYDC5 Papaver sommiferum TYDC5 Papaver sommiferum TYDC5 Papaver sommiferum TYDC7 Papaver sommiferum TYDC9 Papaver sommiferum TYDC9 Papaver sommiferum TYDC9 Papaver sommiferum TYDC2 Petroselinum crispum TYDC2 Petroselinum crispum TYDC4 Petroselinum crispum TYDC4 Petroselinum crispum TYDC4 Petroseum TYDC Citrus aurantium

560	570	580	590	600	610	620	630	640	
<u></u>	<u></u>			· · · • I · · · ·	• • • • • • • •		• • • • • • • •		1
DAVEAPINDER	HVTEAWQII	KHASKFTRN	0HY						
CAPINDER COTON DI UNITA	AVTEAUQUI	KHASKFTEN	HI						
CATCAPINISER	HVKEAWKVI	LEASILLER.							
CALCAPITIOER		TUNDETICE	NI ADECC						
	MAIL MORTE	DUADALLIGI	CNCVUX C						
PATCATINERR	HVATANOTATA	OHLEAFOSAL	RD						
DATE ATTANK	IN A DATA OF TAX	OHLEAFOSAL	ткр						
PATCATIONER	HUUUAOTUU	OHLEAFOSAL							
DATEATINDER	INVVIO	OHLEAFOSAL	KP						
PATCATINGER	HWVVAWTVV	OHLEAFOSAL	KP						
LAVCAPHUPVR	WHAMOIL	EKATALLESI							
REAVCAPLIDMR	HVSAAWOIL	EKATTCFFGI	VASOYGDVK	NIETSDGRO	VEDFLENYFO	FKHDFLGMV	LVNVACPIA	ALVFAIAIK	MFNE
REAVEATLINEER	HVTGANKVV	EHTDAILGAI	GEDVC						
ADAVES TIMPER	HVIYA0KIL	EHADLILGKI	SEADFSS						
REAVESTITEER	HVIHAWEVL	EHADLILSKI	DEANFSS						
REAVGATITEER	hvsmawkvi	EHTDAILGT	DDSVVA						
GAVGATLIDER	hvtcankvv	EHTDAILGAI	DGKTTTIHEI	LD					
FAVGSTLIDER	HVIHAWKVL(EHADLILGKI	SEADFSS						
FSVGATLIDE R	hvtgankvv;	EHTDAILGAI	GDDVC						
REAVEATINGER	HVTGANKVV	EHTDAILGA-							
RFAICGTLTDIN	HVSAAWKVL	DHAGALLDD	FTSNKLVEVI	,s					
REALCGTUIDIN	HVSAAMKVL	DHADALLDD	AFLPKKIVNII	,s					
GAIGGTLIDIN	WSAMKVL	DHADALLDE	AFTAN						
JOINT & SHOULY P	MOV: WKAI	DHANALLNO	3YV						
			-						

Figure S3. Multiple sequence alignment for representative plant TYDC enzymes. Residues identical or similar in at least 80% of the aligned sequences are shaded in black or grey, respectively; gaps introduced are represented by dashes.

	1	10		20	30	4	c	50		60		70	80		90		100	110
			.	1						
Cclementina Ciclev10014992m								MGSLDS	N5	4AESVQ	FKPLDA	QEFRK	QAHQMVD	FIADYY	QNIESY	(PVLT)	QVEPGFL	RSALPD
Cclementina Ciclev10018100m								MGSLNS	DHELKI	NSASF.	NNPMDS	SEEFRR	QGHMIID	FIADYY	RDVEKY	PVLS	QVEPGYL	QKRLPE
Cclementina Ciclev10000723m	MEKLS	STIYTPSF	GTEVIT	NKPPTLP	IPTFLAS	IFFPFNF	VLFSAG	DMGSLTS	DQLDG-	NSGLV	INPLD	PEEFRR	<u>D</u> AHMVID	FIADYY	KNADK?	PVRS	2VEPGYL	RKRLPE
Cclementina Ciclev10033968m										SF	TNPLDS	SEEFRR	QGHMIID	FIADYY	KNVEKY	PVRSG	2VEPGYL	RKRLPE
Cclementina Ciclev10031252m								MGSLTS	DPELKY	NSGSF	TNPLDS	SEEFRR	QGHMIID	FIADYY	KNVEKY	PVRS	VEPGYL	QKVLPE
Cclementina Ciclev10018301m								MGSLTS	DIELEY	NSNSS	INLLDS	SEEFRR	QGHMEVD	FMAEYY	KNIDKY	PVRS	2VEPGYL	KKRLPE
Cclementina Ciclev10025359m						MRAG	EASII	MGSFGL	SANNIT	HGSSF	SADLER	RSFSD	ESKAVID	FIADYY	KNIEKY	PVQSE	(VEPGYL	SARLPD
Cclementina Ciclev10025447m								MGSFGL	SANNIT	HGTSF	SADLER	RSFSD	ESKAVID	FIADYY	KNIEKY	PVQSE	WEPGYL	SARLTD
Cclementina Ciclev10020518m																		
Cclementina Ciclev10025789m																		
Cclementina Ciclev10027405m											LEH	PKSFPD	ESKAVID	FIAGYY	KNIEKY	PVQSI	WEPDYL	SVRLPD
Csinensis orange1.1g010842m								MGSLDS	N»	4AESVQ	FKPLDA	QEFRK	QAHQMVD	FIADYY	QNIESY	PVLT	VEPGFL	RSALPD
Csinensis orange1.1g038818m											MDS	SEEFRR	QGHMIID	FIADYY	RDVEKY	PVLS	2VEPGYL	RKRLPE
Csinensis orange1.1g010125m								MGSLTS	DPELKY	NSGSF	TNPLDS	SEEFRR	QGHMIID	FIADYY	KNVEKY	PVRS	2VEPGYL	QKVLPE
Csinensis orange1.1g048643m								MGSLTS	DQLDG-	NSGLV	INPLDE	EEFRR	QAHMVID	FIADYY	KNVDKY	PVRS	QVEPGYL	RKRLPE
Csinensis orange1.1g037144m											MDQAYZ	QEFRR	QGHMEVD	FMAEYY	KNIDKY	PVRS	2VEPGYL	KKRLPE
Csinensis orange1.1g041829m											MD#	AEQLRE	NAHKMVD	FIADYY	KSIENH	PVLS	2VQPGYL	HNLIPD
Csinensis orange1.1g048019m								MGSFGL	SANNIT	HGSSF	SADLE	PKSFSD	ESKAVID	FIADYY	KNIEKI	IPVQSI	WEPGYL	SARLPD
Csinensis orange1.1g046506m																		
Csinensis orange1.1g048438m																		
Csinensis orange1.1g036996m								MGSFGL	SANNIT	HGTSF	SADLE	RSFSD	ESKAVID	FIADYY	KNIEKY	PVQSE	WEPGYL	SARLPD
Csinensis orange1.1g041549m																		

	120	130	140	150	160	170	180	190	200	210	220
					. <u></u> .	L <u> .</u> <u>.</u>					
1	SAPHRPESFETILK	DVQEKII	PGITHWLSPNF	FAFFPATVS'	FAGFLGE <mark>ML</mark> C	ACFNSVGFN9	LASPASTELE	IVVMDWLATMI	KLPKTEMFSI	TGGGVIQNT?	TSDSIL
n.	SAPYNPEPIETILÇ	DVQQHIVI	PGITHWQSPYY	FAYFPSSGS:	IAGFLGENES	SGFNVVGFNV	MSSPAATELE	NIVMDWLGEMI	KLPKSFLFS	TGGGVIQGT:	ICEAIL
n	CAPYNPESMETILC	DVQEHIV	PGVTHWQSPNY	FAYFPSSGS:	IAGFLGENES	SGFNVVGFNV	ISSPAATELE	NIVMEWLGOMI	KLPKSFLFS	NGGGVIQGT!	ICEAIL
ı	SAPYNPESMETILQ	DVQEHIVI	PGITHWQSPNY	FAYFPSSGS	IAGFLGENES	sgfnvvgfnv	ISSPAATELE	NVVMDWLGQMI	KLPKSFLFS	NGGCVIQGT	TCEAIL
a	SAPNNPESMETILÇ	DVQQHIV	PGITHWQSPNY	FAYFPSSGS.	IAGFLGENLS.	SGENIVGEN <mark>N</mark>	ISSPAATELE	NIVMDWLGQMI	KLPKSFLFS	NGGGVIQGI	ICEAIL
1	SAPYSPESVETILC	DVQEHIV	PGITHWOSPNY	FAYFPATSS	VAGIVGE <mark>NL</mark> S	SGFNVVCLDW	ISSPAAVELE	NIVMDWLGOMI	DLPKSFLFS	NGCCVIOGT	ICEALL
1	TAPHSPESLDDILK	DVTDCIL	PGLTHWQSPNF	FGYFQANAS	FAGFLGE <mark>NL</mark> C	sgfnvvgfnv	LAS PVAT <mark>ELE</mark>	SIVMDWMGKMI	KLPSSFLFS	TGGGVLHGS?	ICESLV
ı	TAPHSPESLEDILK	DVTDCIL	PGLTHWQSPNF	FGYFQANAS'	FAGELGENEC	5GFNVVGFN A	LASPVATELE	SIVMDWMGKMI	KLPSSFLFS	TGGGVLHGS!	ICESLV
1					MLS	AGL <mark>NIVG</mark> FS <mark>M</mark>	ITSPAATELE	MIVLDWLAKLI	KLPEDFLST	Q <mark>GGGV</mark> IQGI2	ASEAVL
n.					MLC	SGFNVVGFNV	LASPVATELE	SIVMDWMGKMI	KLPSSFLFS	TGGGVLHGS?	ICESLV
a	TAPHSRESLDDILK	DVADSII	LGLTRWQSPNF	FGYFQANAS'	FAGFLGENEC	sgfnvvgfnv	LASPAATELE	SIVMDWMGKMI	KLPSSFLFS	TGGGVLHGS	TCESLC
1	SAPHRPESFETILK	DVQEKII	PGITHWLSPNF	FAFFPATVS'	ragflge <mark>nl</mark> ci	ACENSVGENM	LASPASTELE	IVVMDWLATMI	KLPKTEMFS	TGGGVIQNT:	ISDSIL
ı	SAPYNPEPIETILC	DVQQHIV	PGITHWQSPYY	FAYFPSSGS	IAGFLGENES	sgfnvv vg fnv	MSSPAATELE	NIVMDWLGEMI	KLPKSFLFS	TGGGVIQGT	TCEAIL
1	SAPNNPESMETILQ	DVQQHIV	PGITHWQSPNY	FAYFPSSGS	IAGFLGE <mark>ME</mark> S	SGFNIVGFNW	ISSPAATELE	NIVMDWLGQMI	KLPKSFLFS	NGGGVIQGT	TCEAIL
ı	CAPYNPESMETILQ	DVQEHIV	PGVTHWQSPNY	FAYFPSSGS:	LAGFLGE <mark>ME</mark> S	SGF <mark>NVVG</mark> FN <mark>X</mark>	ISSPAATELE	NIVMDWLGQMI	KLPKSFLFS	NGGGVIQGT!	ICEAIL
ı	SAPYSPESVETILC	DVQEHIV	PGITHWQSPNY	FAYFPATSS	VAGIVGE <mark>NE</mark> S	SGFNVVGLDW	ISSPAAVELE	NIVMDWLGOMI	DLFKSFLFS	NGGEVIQGT:	ICEALL
a	SAPHHPESLQNVLD	GYIDIQEKIL	PGVTHWQSPNY	FAYYPSNSS	VAGFLGENES	AGLNIVGFS <mark></mark>	ITSPAATELE	MIVLDWLAKLI	KLPEDFLSS	QGGGVTQGT/	ASEAVL
1	TAPHSPESLDDILK	DVTDCIL	PGLTHWQSPNF	FGYFQANAS'	FAGFLGENLC	SGFNVVGFN2	LASPVATELE	SIVMDWMGKMI	KLPSSFLFS	TGGGVLHGS:	ICESLV
h											
n											
ı	TAPHSPESLDDILK	DVTDCIL	PGLTHWQSPNF	FGYFQANAS'	TAGFLGE	SGFNVVCFN7	LASPVATELE	SIMMEWMGKMI	KLPSSELFS	TGGCVLHGS?	ICESLV

Cclementina | Ciclev10014992m Cclementina | Ciclev10014902m Cclementina | Ciclev10000723m Cclementina | Ciclev10003252m Cclementina | Ciclev10031252m Cclementina | Ciclev10025339m Cclementina | Ciclev10025439m Cclementina | Ciclev10025447m Cclementina | Ciclev10027405m Cclementina | Ciclev10027405m Csinensis | orangel. 19038018m Csinensis | orangel. 19038018m Csinensis | orangel. 1904842m Csinensis | orangel. 1904842m Csinensis | orangel. 1904842m Csinensis | orangel. 19048615m Csinensis | orangel. 19048615m Csinensis | orangel. 19048615m Csinensis | orangel. 19048615m Csinensis | orangel. 1904895m Csinensis | orangel. 1904895m Csinensis | orangel. 1904895m Cclementina | Ciclev10014992m

Cclementina [Ciclev10014992m Cclementina [Ciclev10018100m Cclementina [Ciclev10030723m Cclementina [Ciclev10033968m Cclementina [Ciclev10031252m Cclementina [Ciclev10025359m Cclementina [Ciclev100253789m Cclementina [Ciclev10025789m Cclementina [Ciclev10025789m Cclementina [Ciclev10025789m Cslementina [Ciclev10025789m Cslementina [Ciclev10025789m Csinensis [orange1.19038818m Csinensis [orange1.19038818m Csinensis [orange1.19038818m Csinensis [orange1.19043018m Csinensis [orange1.190480506m Csinensis [orange1.190480506m Csinensis [orange1.190480506m Csinensis [orange1.190480596m Csinensis [orange1.19048549m

	230	240	250	260	270	280	290	300	310	320	330
	2.50	1	230	200	210	200	230	500	510	520	550
VINT	ABBRARDAW		AN STORES	FARVORTAR	SPARTRATP	SVDANES	POLERAMEA	WEART WELE	TCATVERT STT	WIN	
CTIA	ARDOTINET	RENTSRIM	AVYCSDOTHS		DEKNERATK	TKSSSFT	PESLOAATDL	TOSCLIPLE	LCATWGTTATT	TWICP	
CTUT	AARERVINKI	RENISKIA	VYCSDOTHC		DLKNFRAIK	TKSSSYG	PDSLLTOINL	VEAGLVELE	LCATIGTTAIT	WIR P	
CTLT	AARDRVLNKI	RENISKIV	VYESDOTHE	LORAZOIVGI	DVKNFRAIK	TKSSSYGLS	SPDSLMAKINS	VEAGLIPLE	LCATIGTTAIT	WDT	
CTLT	AARDRVLNKI	RENISK I I	VYCSDQTHC	ALQKAAQIVGI	DVKNFRAIK	TKSSSYGE	SPDSLMAQINS	VEVGLIPLE	ICATIGTTAIT	AVDP	
CTLT	AARDRVLKKI	RENISKIV	VYSSDQTHC:	AFORAAQIVCI	DRKNIBAIK	TKSSSYGE	BAESVLSQINL	VEAELIPLE	LCATVGTT AIT	AVID P	
CTLA	AARDKALEKI	GGEDNITKLA	VYASDQTHE	ALOKSAKLICI	PPANFSPLR	ISFSTEFSIS	SPDTVRAAIED	IKSCHVPLY	LCATVGTTGAG	WDPIEE	
CTLA	AARDKALEKL	GGFDNITKIV	/VYASDQTHF)	ALQKSAKLICI	PPANFRPLR	ISFSTEFSES	SPDTVRAAIED	IKSCYVPLY	LCATVGTT GAG	AVDPIEE	
VVILL	aare kalkrv	SKNSLEKIV	/VY <mark>ASDQTH</mark> SJ	ALQKACQIGGI	HPONFRVLK	TDSSTNYSIS	SPDSLAEAISR	LTIGLIPFF	lcatvgttsst	AVE P	
CTLA	AAREKALEKL	GGFDNITKIN	/VYASDQTHF3	ALQUSAKLIAA	ALTR	ISFSTEFSIS	SPDTVRAAIED	IKSGHVPLY	LCATVGTT GAG	AVDPIEE	
		FDNITKIV	/VYASDQTHF:	5lq k saklvci	PPANFELLS	SFLTEFSER	SPHTVRAAIED	VKPGFVPFY	LCATIGIT GAG	KQEVVD	SFLES
VTLI	AARERALDAV	AENMHKN∖	VYGSDQTHS	FARVCKLAC	SPANIRALP:	ISVDANFSIS	BPQLLRRAVEA	VEAGLVPLE	ICATVGITSTT	WEN	
CTHA	AARDOIDNEI	RENISRUA	/VYGSDQTHS)	ALQRAAQIACI	DPKNFRAIK	TKSSSET	PESLQAAIDL	IQAGLIPLE	LCAT VOITALT	PVDP	
CITT	AARDRVIINKII	GRENISKUI	VYGSDQ/THC/	ALQRAAQI VEI	DVKNEBALK	TKSSSYGE	SPDSLMAQINS.	(ARAGUIDTE	LCATIGTTAL'I	AVDP	
OTHE	9ARDRVINKI 1. DDDDIWLVI	RENISKIV	VIESDQIHC	ALQNAAQIVGI NDONAAQIVGI	DIKKFRAIK	TKSSSTG	SPDSLLTQINL	VEABLVELE	LCATIGITATI	NUCP	
VVIT	AADDZALKDA	SKNSI EKUA	AVASDOTHS	V ORACOTOCI	HDOWFOOT	I Kasal Gra	SDDSI VEVI SD	VEALUESE	LCADVADUS ST	NUP P	
CTUA	AREKATEKL	COFDUTTRUT	WYASDOTHE	LOKSAKLICI	PPANEDPLR	SESTRES	SPDTURAAVED	TKSCYNDLY	I CATVOIT CAC	WDPIFF	
01 0 1		001 0111 1001			DVKNERATK	TKSSSYCI	SPDSLMAKINS	VEACUTELE	LCATTGTTATT	WIT	
								AGLIELE	LCATEGETAIT	WIDP	
CTRA	SAREKA EKI	GGFDNITK	WYASBORNED	ALONSAKLI							
				~							
	340	350	360	370	380	390	400	410	420	430	440

				1		.	.				- 1 -		1.	I			.		1	· • I		.				!	1	- -	
	VE	PLAE	/ENEY	GIQV	IMDAA'	YAGSA	CICE	2 FR	HYLN	IF	VD	FSF	SP	10612	LSY	LDC	CLWV	KQP	GL	VKA	LST	DPE'S	LK	KPS	ESN	1	s	đVĐ	FKDW
	LG	PLCD	AKRY	SIGI	IMDAA'	YAGSA	CICP	EFR	HFID	TES	ADS	FSI	NA	HKWI	FFTT	LDC	CCMWW	KNP	NA	IKA	LST	IPER	LR	KAS	DSK	(Q	VVD	YKDW
	LK	PLCD	/AKOE	GIQV	IMDAA	YAGSA	CICE	20 FR	HFID	e∨∎e	ADS	SFSI	NA.	HKØI	FFTT	1DC	CLWV	KDP	SA	VSS	LST	1PEN	LKR	KAT	ESK	(0	VVD	YKDW
	LK	PLCD	/AKOE	GIQV	IMDAA	YAGSA	CICP	'EFR	HFID	eve G	ADS	SFSI	NA.	HKW	FFTT	LDC	CENN	KDP	SD	VNS	LST	(PE)	(LK)	KAT	ESK	(0	0VD	YKDW
	LK	PLCD	/AKOE	GIQV	INDAA'	YAGS7	CICP	EFR	HFID	ev Be	ADS	FSI	NA	HKW	FFAT	LDC	CLWV	NDP	RA	VSS	LST	(PE)	LK	KAT	ESM	4	0	ØV₽	YKDW
	LK	PLCD)	AKOB	GINV	IVDAA'	YAGSA	CICE	PFR	HEID	eviec	VDS	SFSF	NP	нки	FTT	1 DC	CERV	KDP	sc	LST	LST	(PO)	(LK	FAT	DOP	PKE-	0	EVE	YKDW
		- IGKI	ANEY	KLAL	ITDAA	YAGSA	CICE	DYR	HYLN	e VID I	ADS	TTT	NP	IKMI	TITN	MDC	CLIWW	KHP	SF	VDS	LST	SDI	MR	RSP	ASN	ITST	IAAP	5 I F	YKDW
		GK	ISNEY	KLAL	IIDAA	YA				VEL	ADS	TST	NP	HKW	CLEN	MDC	GCLWW	KH P	RF	VDS	LST	(SD1	MR	RSP	ASN	ITSTI	JAAP	VID	YKDW
	LL	ALGN	KSN	GMRE	INDAA	VAGSZ	CTCR	n vie	OVID	V P	ADS	FNN	IN A.	HKIR	TTN	FILE	SALMO	KDR	NT	TOS	LST	JPER	T.K	KAS	OAN	J	M	οvτ	YKEW
		GK	ANEY	KINT	TDAA	VAGSI	CTCE		RYLM		ADS	- 61	NР	I KINT	TTM	MDC	CITACIO	NH P	SE	WD S	1.91	75DT	MR	RSP	ASN	JTSTI	JAAP	от F	YKEW
TRUT	ESEGU	TATI	CONHT	LLEV	AGGOA	YR-SZ	CTCP	2 E F R	HYLM	evis T	ADB	VIST.	M P	HIRIDA	TUTIN	MDC	GCTMW	SHS	SE	VES	OST	CSDT	MR	RSP	ASS	TST	IVAP	οŦ-	YKDM
	VE	PLAF	MANEY	CINV	MDAA	VAGSZ	CTCP	B FR	HYLN	TER	VD	S F S F	SP	нки	LSY	Inc	CLEAN	ROP	GL	VKA	T STT	IPEN	T.K	RPS	ESN	J		UVT	BKDW
	L.C.	PLOD	NUDY	C T O12	INDA A	VACER	CTCS	200	UPTD		7 88	TT ST	3.1	12101	e en marce	Inc	COLOR	WN D	MA	TKA	T.C.Th	IDEL	T.D.	VAG	DOK				VEDR
	10		N VOL		NODA A	VACCE	0101 0100	500			AD			12301		The	COLWE		DA	110 0	TOTA	IDEN	T VIS	122T	Tev	s	×	1. F	VPDM
			N VOT	CTAN	TODAA	VACER	0102	T RO			200	1.0		110001	C D PAL	The			0.7	1000	T 0 00	1081	T 1214	LCD T	TOP	/	Ň	1. F	V M D D
	т.и.				TVD/AA	un cor	0105						30			100		10.0	200	7 C III	1000	1001		D D D	DOP	2DKD	×		TRE-99
	DK		COLUCE NOV	CMOR	IVDAA	INGOP	CICP CICP		OVID					17.001	22 I I 27 II X	Epc.		BDT BDD	20	101	1.000	UDE1	LINE	EMI MBC	DÖR	1 C.D.D.		200	I KLW
		SIGN.	LON DI	GRIME	IVDAA	INGSP	CIUP		011D		1	or ner	10.0	10.01	: LTIN	L L C	SALWY	NUR	NT	173	1.5.11	PER	LINE	NA3	Quan	1	M	2 Y L	I KL99
		GK.	ENEY	KLO-	IDAA	IAGSA	CIC	E E	HYLN	SYP -	AD			1KW1	TTN:	NDC	GCLWV	RHP	RF	VDS	1.3.1	GDI	МЮ	RSP	-				
	LK	PICD	/AKQ3	GIMA	INDAA	TAGSA	CIUP	AD FIR	HEID	S V B G	ADS	1 P M	A A	11317	. B. B. T	LUC.	COLWA	RDP	SD	VKS	LST	(PE2	LKE	KAT	ESF		2	ſΈ	YKDW
	LK	PICD	MKQ1	GIMA	INDAV	YAGS/	ICT FE	e Pie	HEID	e via G	AD	P S I	μA	HKW	PAT	1110	COMA					(5 E)	: LK	КAТ	- Sh	·	P	AVE.	17KDW
					- 53												-			in a second									
					Ç E	n R- 8 2	CICE	PPR	HYLN	SVIPI	ADS	VÖI	PI	1881	TUN	NDC	CUMA	BHS	SF	VDS	C Real	GDI	MR	RSP	AS 5	SISTI	IVAP	71 D	YKDW

Cclementina | Ciclev10014992m Cclementina | Ciclev10018100m Cclementina | Ciclev10030723m Cclementina | Ciclev10031952m Cclementina | Ciclev10031952m Cclementina | Ciclev10025359m Cclementina | Ciclev10025318m Cclementina | Ciclev10025789m Cclementina | Ciclev100277405m Csimensis | Corage1, 1901042m Cclementina | Ciclev10027405m Csinensis | orangel.1g010842m Csinensis | orangel.1g030818m Csinensis | orangel.1g048613m Csinensis | orangel.1g048643m Csinensis | orangel.1g041829m Csinensis | orangel.1g048015m Csinensis | orangel.1g04861506m Csinensis | orangel.1g0486506m Csinensis | orangel.1g048549m



Figure S4. Multiple sequence alignment for *Citrus* sequences retrieved in this work. Residues identical or similar in at least 80% of the aligned sequences are shaded in black or grey, respectively; gaps introduced are represented by dashes.

TDC1_Actaea_racemosa TDC2_Actaea_racemosa partial_TDC_Actaea_racemosa TDC2_Camptotheca_acuminata TDC2_Camptotheca_acuminata TDC2_Capsicum_annuum TDC2_Arabidopsis_thaliana TYDC1_Arabidopsis_thaliana TYDC1_Arabidopsis_thaliana TYDC1_Arabidopsis_thaliana TYDC1_Arabidopsis_thaliana TYDC2_Citrus_stanatum TYDC2_Citrus_reshni TYDC2_Citrus_reshni TYDC2_Citrus_stanatum TYDC2_Citrus_stanatum TYDC2_Citrus_stanatus TYDC2_Papaver_sonniferum TYDC2_Papaver_sonniferum TYDC3_Papaver_sonniferum TY

1	10) 20) 30	0 40	5	. 60	. 70) 8	0 90	100
	1									
					MGSLPAN	IPEPE	LKDFNELDLE	DLEKOAYQTV	DFIVDYYKNI	BSYPVL
					MGSFPAN	IPE	LKDFNELDLE	DERKOAYQTV	DFIVDYYKNI	BSYPVL
						PE	LKDFNDWDLE	DERKOAYOTV	DFIVDYYKNI	BSCPVL
					MGSLDSN	YDTESPAS	VGQFNELDPE	EFRKOAHCIV	DFIADYYKNI	BSYPVL
					MGSIDSN	YDTES	AGQCRELEPE	DERKOAHQMV	DFIADYYKNI	BSYPVL
					MGSLDSN	NSTQTQSN	VTKFNELDPE	DERTOAHQMV	DFIADYYKNI	BSYPVL
						-MEG	ELKEMDAE	QLREYGHKMV	DFIADYYKNI	ETLPVL
					MGSIDST	N-VAMSN-SP	VGEFKELEAE	EFRKOAHRMV	DF I ADYYKNV	ETYPVL
					MGSIDTS	DGDAYAN-SA	VAPFKELDPD	DERKOAURMV	DF I ADYYKNI	BNYPVL
					MGSISEN	CDDSISL	AAPFRELEPE	DIRKOAHIMV	DFIADYYKNI	BNYPVL
					MGSISEN	CDDSISL	AAPFRILEPE	DERKOAUVMV	DFIADYYKNI	DNYPVL
					MGSIDST	D-VAISA-SP	VAEFKELEAE	DIRKOAHRMV	DFIADYYKNV	BSYPVL
					MGSIDST	N-VAPST-PS	IAEFKELDAE	DERKEAURMV	DFIADYYKNV	DNXEAT
					MGSIDST	NDVALSNGSS	VGEFKELEAE	DERKOAHCMV	DFIADYYKNV	SYPVL
	MFK	PQHMYDREFG	TGNGYSNGNG	YTNGNGHTNG	NGNYNGNGHV	NGNGKANGAK	VVKMKEMDSE	LIREOGUIMV	DFIADYYKNL	QDSPQDFPVL
	MFK	PQHMYDREFG	TGNGY SNGNG	YTNGNGHTNG	NGNYNGNGHV	NGNGKANGAK	VVKMK:MDSE	LIREOGRIMV	DFIADYYKNL	ODSPODFIVL
						MENGSGK	VLK:MDSE	QUREYGULMV	DEIADYYKTI	BDFEVL
						MENGSGK	VLK:MDSE	QLEYGULMV	DIJIADYAKTI	DFEVL
					MGSLNTE	DVLENNTA	FGVINLEPE	DARKOGIMLI	DFLADYYRDI	SKYEVR
					MGSLHVE	D-LDNISK	CTVENELDPE	DISRROGIMMI	DFLADYYRDV	BKYEVR
					MGSLTSD	PELKINS	GSFTNELDSE	DIRROGIMLI	DELIADITKNV	SKYEVR
					MGSLTSD	PELKINS	GSFINELDSE	BERROGENIII	DETADYTENV	SKYEVE
					MCGLTSD	PELKINS	GSFTNSLDSE	DI RECOUNT I		
					MGSLISD	PELKINS	GSFINELDSE	DISROGUMII	DETADIORNY	
	v	VIOTWCIEUD	CDVKI CCCVI	TEDUTEUSVO	VUID DEWCCV	FEIRINS	FINAMONE	OTHER	DETADAWKIT	INT TRUE
		VLQINCLIND	SDARLOGGIL	MINICIPE	TRTES	MEEGGGG	ELKANDAE	OLUZIOG MONT	DETADYYKTT	DN FRMT
				MIAIDSDIFS	MGSLDAN	N-FESMSL	CS-ONELDED	DEPENDENT	DELADYYKNW	DKYRVR
					MGSLNTE	DVLENSSA	FOVENELDEE	DEPROGEMENT	DELADYVEDV	DK YDWD
					MGSLNTE	DVLEHSSA	FGATNELDPE	REPORT	DELADYYRDV	PKYPWR
					MGSLPTD	N-LESMST	CS-ON-LDPD	200 BOG MTT	DELADYYKNV	KVS-SB
					MGSLPAN	N-FESM3L	C3-ON-LDFD	STREAGHMIT	DELADYXKNV	BRXEVR
					MGSLNTE	DVLENSSA	FGVTNELDPE	EFRROGHMII	DFLADYYRDV	PKYPVR
					MGSLPTN	N-LESMSP	CS-QNELDPD	DERROGIMII	DFLADYYKNV	⊳KYPVR
					MGSLPTN	N-LESISL	CS-QNLLDPD	EFRROGHMII	DFLADYYKNV	BNYPVR
								EFRROGHLMI	DFLADYYRKV	BNYPVR
					MGSIDNL	T-EKLAS	QFPMNTLEPE	EFRROGHMMI	DFLADYYRKV	BNYPVR
					MGSIDNL	TAQKLTSS	QFPMNTLEPE	EFRRQGHLMI	DFLADYYRKV	BNYPVR
					MGSIDNL	MAQKLTS	QFPMNTLEPE	ERRROGHLMI	DF <mark>LADYY</mark> RKV	BNYPVR
					MGTLNIN	HELDDQ I	FNTINELDPE	DERROGEKIV	NFLADYYQNI	BQYEAC
					MGSLHVE	D-LDNISK	CTVENELDPE	ERROGHMMI	DF <mark>LADYY</mark> RDI	DKYPVR
MSPF	HTLYKS	DGLASERQIA	EATTFLFLVA	STSQESFNLV	SGEMGSLESI	VNLENNS	SDIVNELNPD	GERROGHMII	DF <mark>LADYY</mark> QNI	BKYPVL
					MGSLDSN	MAES	-VOFKELDAO	DURKOAHOMV	DF <mark>IADYY</mark> QNI	BSYPVL
					MGSLDSN	MAES	-VQFKELDAQ	DISCKOALQMV	DFIADYYQNI	BSYPVL

TDC1 Actaea racemosa TDC2 Actaea racemosa TDC2 Actaea racemosa TDC1 CamptoTheca acuminata TDC2 CamptoTheca acuminata TDC2 Capsicum annuum TDC Catharanthus roseus TDC Mitragyna speciosa TDC Mitragyna speciosa TDC Antonia pomila TDC Antonia pomila TDC Tabernaemontana elegans TDC Antonia verticillata TDC Tabernaemontana elegans TDC Antonia verticillata TDC Tabernaemontana elegans TDC Atabidopsis thaliana TYDC1 Arabidopsis thaliana TYDC1 Arabidopsis thaliana TYDC1 Arabidopsis thaliana TYDC1 Citrus reshni TYDC2 Citrus reshni TYDC2 Citrus reshni TYDC2 Medicago truncatula TYDC1 Medicago truncatula TYDC2 Papaver somiferum TYDC2 Papaver somiferum TYDC3 Papaver somiferum TYDC4 Papaver somiferum TYDC5 Papaver somiferum

	110	120	0 130	140	150	0 160	170	180	190	200
SQVNI	-GYLRT	QUPESADNKP	E PFET IL K D V	QNVIIPGMTH	WLSENFFAYF	PATVSSAAFL	GENECTORS	VGENWLASEA	STOTESVVMD	WLARLUKIE T
SQVKI SOVKI	PGYIRT PGYIRT	QUPESAPNKP OUPESAPNKP	EPFETILKDV EPFETILKDV	QNVIIPGMTH ONVIIPGMTH	WLSPNFFAYF WLSPNFFAYF	RATVSSAAFL RATVSSAAFL	GEMLCTGENS GEMLCTGENS	VGENWLASPA VGENWLASPA	SIVEINE SVVMD SIVEINE SVVMD	WLARLUKUPT
SQVD	GYRHS	RIGKNAPYRS	EPFESILKDV	QKDI I PGMTH	WMSPNFFAHF	BATVSSNABV	GEMLCTCENS	VGRNWLASPA	A <mark>nding</mark> MVVID	0 LANMIKLEK
SQVEI	PGYLOS PGYLRN	HUPENAPYLP	ESLDTIMKDV	EKHIIPGWTH	WLSPNEFAYF WLSPNEFAFF	PATVSSNADV	GEMILCICINA	VGENVLASPA	MUDIDMI IMD	#LASMIKIPN
SQVE SQVE	PGYLRK PGYLRK	LIPETAPAHS REPETAPAHS	ETLONVLEDV	QTKILPGVTH OKDULPGMTN	WOSPDYFAYF	PSNSSVAGEL DATVSSDAFL	GEMLSAGINM	VGPSWITSPA VGDTZVSSPA	ATCHEMIVLD ATCHEMIVMD	WLAKALKIED
sqv⊵i	GYLRT	QUSQUARYLP	EPFENIDQDI	QKDIIPGMTN	WLSPNFFAFF	PATVSSAAFI	GEMLCTGENS	VGENWLASPA	AWIDMVVMD	WLANMUKUPK
SQV⊡I SQV⊡I	PGYLKN PGYLKN	RUPETAPHLP RUPETAPHLP	esfetilkdi Fefetilkdi	KKDIVPCMEN KKDIVPCMEN	WLSPNFFAYF WLSDNFFAYF	EATVSSNADV DATVSSNADV	GEMI CTGENS	VGFTWLASPA VGFNWLASPA	SIVELEMVVID SIVELEMVVID	WLANM KUCK
SQVE	PGYLRE PGYLRE	REPETPPYLP	DSLDKIIDDI	QKDIIPGMTN OKDIMPGMTN	WMSPNFYAFF WMSPNFYAFF	PATVSSAAFL	GEMLSTALNS	VGFTWVSSPA	ATTEMENT VMD	WLAQMUKUPK
SQVE	PGYLRE	REPETAPYLP	SLDKIMSDI	QKDI I PGMTH	WMSPNFYAFF	PATVSSAAFL	GEMLSTALNS	VGFTWVSSPA	ANDIADMIVMD	*LAKMIKLPE
SQVQI SOVOI	PGYLED PGYLED	MLED SAPERP MURD SAPERP	ESLKELLDDV	SKKIMPGITH	nospsyfayy Nospsyfayy	ASSTSVAGEL	GEMINAGLSV GEMINAGLSV	VGFTWLTSPA VGFTWLTSPA	ANDINDIIVLD ANDINDIIVLD	WLAKLIQUED
sovoi	GYLHK	LLEDSAEDHE	ETLDQVLDDV	RAKI LPGVTH	NOSPSFFAYY	ESNSSVAGET	GEME SAGLGI	VGPSWVTSPA	AUDINDMIVLD	WVAKLINISPE
SQVQI	-GILLERK	RUPETAPYNP	ESMESILEDV	QNEIIPGITH	NQSPSHIAII NQSPNYFAYF	PSSGSIAGEL	GEMISAGLGI	VGDNWMSSPA	ANGINEMIVID	WLGKMUKUPK
SQVEI SOVEI	GYLRK	RLPESAPYNP VIDESAPNNP	EPIESIIQDV ESMETTIODV	QSHIVPGITH OOHIVPGTTH	WOSPNYFAYF WOSPNYFAYF	PSSGSTAGEL PSSGSTAGEL	GEML STGFNV	VGENWMSSPA VGENWISSPA	AUCTONIC	WLGKMURUPK
SQVE	9GYLQR	VLPESAPNNP	ESMETILQDV	QQHIVPGITH	WQSPNYFAYF	PSSGSIAGFL	GEMLSSGFNI	VGFNWISSPA	AWEIDENIVMD	WLGOMUKUPK
SQVEI SQVEI	PGYLQK PGYLQK	VIDE SAENNE VIDE SAENNE	ESMETILQDV	QQHIVPGITH QQHIVPGITH	n oseny fayf Noseny fayf	PSSGSINGEL PSSGSINGEL	GEMLSSGENI GEMLSSGENI	VGENWISSPA VGENWISSPA	Andronive Andronive	WLGOM KURK WLGOMIKIEK
sover	PGYLQK	VLRESARNNR	ESMETILODV	QQHIVPGITH	XQSENYFAYF	PSSGSIAGEL	GEMLSSGENI	VGENWISSPA	ANDIABNIVMD	WLGQMIKIEK
sovor	GYLGK	LUPDSAPTHP	ESLQHVLNDV	QEKILPGVTH	WOSPNIFAIF	PSNSSIAGEL	GEMLSAGLNI	VGFSWISSPA	ANDIADTIVLD	WLAKAI LIEP
TQVDI SOVIDI	2GYLKK 2GYLRK	RLEESAPYNP RUPETAPYNP	ESIETILEDV ESIETILODV	TNDIIPGLTH TTEIIPGLTH	WQSPNYFAYF WOSPNYYAYF	PSSGSIAGEL PSSGSVAGEL	GEMI STGENV GEMI STGENV	VGENWMSSPA VGENWMSSPA	AND NO STVMN	WLGQMUTHEK WEGKMUNHEE
SQVE	GYLRK	RIPETAPYNP	ESIETILODV	TSEIIPGLTH	NCSPNYYAYF	ESSGSVAGEL	GEMLSTGFNV	VGENWMSSPA	ATTELEGIVMD	WFGKMUNLEK
SQANI SQVEI	PG-SQQ PGYLIKK	THEE TAENES RUPESARYNE	ESIETILODV ESIETILEDV	QNDIIPG1TH TNDIIPG1TH	WQSDNYFAYF WQSDNYFAYF	PSSGSVAGEL PSSGSIAGEL	GEMILSSGENV GEMILSTGENV	VGENVMSSIDA VGENVMSSIDA	AND NO SIVMN AND DO SIVMN	WLGQMUNIEK WLGQMUTIEK
SQVE SOVE	PGYLRK 2GYLKK	RUPETARYNE RUPESNRYNT	ESIETILQDV ESIETILEDV	TTEIIPGLTH TNDIIPGLTH	WQSPNYYAYF WOSPNYFAYF	ESSGSVAGET ESSGSTAGET	GEMILSTGENV	VGENWMSSPA	AND NO SIVAD AND NO SIVAD	WEGKMUNIPE
sover	9GYLKK	RUPESARYNR	ESIETILEDV	TNDIIPGLTH	WQSPNYFAYF	PSSGSIAGEL	GEML STGENV	VGENWMSSPA	ATTEMPSIVMN	WLGQMUTIERK
SQVSI SQVSI	PGYLRE PGYLRE	ILPESAPYNP ILPESAPYNP	ESLETILODV	QTKIIPGITH QTKIIPGITH	WOSPNFFAYF WOSPNFFAYF	PSSGSTACFI PSSCSTACFI	GEMI STGENV	VGENWMVSPA VGENWMVSPA	Amene NVVTD Amene NVVTD	WFGKMUOUEK WFGKMUOUEK
sovsi	GYLRE	ILPESARYNR	ESLETILODV	QTKIIPGITH	WQSPNFFAYF	PSSGSTAGEL	GEMLSTGENV	VGENWMVSPA	ATCINONVUTD	WFGKMLQLPK
SQVSI	PGYLQK	IVPNSAPNNS	ESLEKILKOV	ERDIIPGLTH	WQSPNFFAYF	PSSGSTAGEL	GEMISTORY	VGENWISPA	AUSIDSVVID	WFGKMINIEN
SQVE SOVE	2GYLRK 2GYLRK	EIEDSAPYNP LUEMSAPYIA	ESIETILEDV EPVEATLODV	HKQIIPGITH EKHIIPCITH	WQSENYFAYF WOSENYFAYF	RSSGSVAGEL RSSGSVAGEL	GEMLSTGENV GEVLSTGENV	VGENWMSSPA VGENWISSPA	ANDINDSIVMD ANDINDSIVMD	WLGKMUKIEK WLGOMUEUEO
πQV⊡	GFLRS	ALPDSAFHRP	ESFETILKOV	QEKIIPGITH	WLSPNFFAFF	PATVSTAGEL	GEMLCACENS	VGRNWLASPA	STUDIODIVVMD	ØLATMUKLEK
INOV (E1)	A DOMESTIC:	AIRSUNCTION	DOUS REPORT OF MARKING AND	ORBITIST	1711 - SHEAR (FT O/ 4110)	LUATIVE TO COLL	INCRAIN ACTING	MICHANNE TRACE 24	ISSUED FOR T VANAME	OT A TWEEKINSK

TDC1 Actasa racemosa TDC2 Actasa racemosa partial_TDC Actasa racemosa TDC1_Camptotheca_acuminata TDC2_Camptotheca_acuminata TDC2_Capsicum_annuum TDC2_Capsicum_annuum TDC2_Capsicum_annuum TDC2_Capsicum_annuum TDC2_Capsicum_annuum TDC2_Capsicum_annuum TDC2_Capsicum_annuum TDC2_Tabernaemontana_elegans TDC fulverhia_pvericillata TDC7_Nachidopsis_thaliana TTDC1_Arabidopsis_thaliana TTDC1_Arabidopsis_thaliana TTDC1_Arabidopsis_thaliana TTDC1_Arabidopsis_thaliana TTDC1_Arabidopsis_thaliana TTDC1_Arabidopsis_thaliana TTDC1_Arabidopsis_thaliana TTDC1_Arabidopsis_thaliana TTDC1_Catrus_actana TTDC_Citrus_acuantium TTDC2_Citrus_acuantium TTDC2_Citrus_acuantium TTDC2_Citrus_sinensis TTDC2_Medicago_truncatula TTDC2_Papaver_somiferum TTDC2_Patroselinum_crispum TTDC2_Patroselinum_crispum TTDC2_Patroselinum_crispum TTDC2_Patroselinum_crispum TTDC2_Patroselinum_crispum TTDC2_Patroselinum_crispum TTDC2_Patroselinum_crispum TTDC2_Patroselinum_crispum

210	22	0 23	0 240	250	260	27	280	290	300
SIMISSDT	GGGVIHG	ATSEATICAL	VASDIRAPET	I CDENTAKIN	WISSDOTHST	LAGACKIAC	LISERVIEV LPH	SKEDNEALSS	TNERTTEAD
SIMISDT	GGGVIHG	TSPAIRCEL	VISRORALET	ICDENIAK	VYGSDOTHST	LVCACKIAGE	LEGNVEVIPE	SKEDNFALSE	TNEOTTIEAD
SEMESGT	GGGV1/QG	TTSEAILCTL	IAASPMHFEI	VEVKTSTSFV	VYGSDQTHST	YAKACKLAGI	LPCNIRSIPT	TADSNFSVSP	LLURRAIEAD
SFTFLGT	GGGVIQG	TTSEAILCTL	IAARDRALES	IGVDSIHKIV	VYGSDQTHST	YAKACNLAGI	LPCNIRSIRT	EAVANFSLSE	DSCHREIEAD
CaMaSGT	GGGVIIQG	TISBAILCTI	IAARDRKLEN	IGVDNIGKIW	VYGSDQTHSM	YARACKAAGI	FRONIRAIST	CVENDFSLSF	AVERGIVEVD
EDLSTGQ	GGGVIIQG	nASi55VIIVVII	LAARDKVIER	VEKDAISKIN	VYCSDQTHSS	LQRACQIGGI	HEENFRVLKE	DPSRDYALSP	DTHSEAVSHD
SomoSGT	GGGVIIQN	TSESIFCAL	TAARERAITEK	LEPDSIGKIN	CYGSDOTHTM	FPRTCKLAGI	YENGIRLIPH	TVETDFGISE	QVIERKMVEDI
SIMUSUT		TTSEATIOTT	TAARDGATEK	TEMENVGKIN	VIASDOTHSF	FORTCKVAG	PROVINTE	TREDNESMSP	TAUREOTEAD
SIM HGT	GGGVIOG	TSPAIRCE	IAARDGADEK	IGMENVGKLV	VYGSDOTHSF	FOUTCRVAGE	FRONIKLIPA	TREDNESMSP	IAPREOIEAD
SRMRSGT	GGGVIIQN	TTSESILCTI	IAARERALEE	LGVDSIGKLV	CYGSDOTHTM	FPRTCKLAGI	SEKNIRLIPT	TAETDFGIAP	EVERGMVEAD
SEMESGT	GGGVIQN	TISESILCUI	IAARERALDK	LGQDNIGKLV	CYGSDQTHTM	FPRTCRLAGI	FPSNIRLVPT	TAETDFSIAP	EVERKMVEAD
CEMESGT	GGGVIQN	TISESIICHI	IAARERVIEN	LCPNSIGKLV	CYGSDQTHTM	FPKTCKLAGI	FEDNIRLIFT	TLETDFSIDP	HVEREMVKAD
Holston	GGGVIΩG	IGODAVIIVVV	LAARDRIIKK	VCKTLLPQIV	VYGSDQTHSS	FREACLIGGI	HEENIRLLKT	DSSTNYGMP	ESCEEAI SHD
Holston	GGGVIQG	nGCsQVIIVVV	LAARDRIDKK	VEKTLLPQIN	VYGSDOTHSS	FREACLIGED	HEENIRLLKI	DSSTNYGMPE	ESPEEAISHD
QBMSKGN	GGGVILQG	SASISTUTIVI	TAARDKVIERS	VEKNALEKIV	VYSSDOTHSA	LORACQIAGI	HEENCRYLTH	DESTNYALRE	ESIQEAVSED
SolosGN		UTCOATUCUT	TAAPDPMINK	TERENTERIN	WISSDOTHSA	LOCALOTACI	MERNERAVOR	FRANSFOLSA	DTICKUTES
Salasgs		TTOFALLCTL	TAARDRAUCE	ICRGEIGRIM	VYGSDOTHCA	LOGAAOTAGI	DEANFRAVKU	ARSDNFGMSA	AAURAAVEED
SELESGN	GGGVIIQG	TTCEAILCTL	TAARDRVINK	IGRENISKII	VYGSDOTHCA	LOGAAQIVGI	DVKNFRAIKT	TKSSSYGLS	DSUMAQINSD
SILISGN	GGGVIQG	TTCEAILCTL	TAARDRVLNK	IGRENISKLI	VYGSDQTHCA	LQNAAQIVGI	DVKNFRAIKT	TKSSSYGLSE	DSUMAQINSD
SELESGN	GGGVIQG	TTCEAI LCTL	TAARDRVINK	IGRENISKLI	VYGSDQTHCA	LQKAAQIVGI	DVKNFRAIKI	TKSSSYGLSP	DSUMAQINSD
SPLPSGN	GGGVIIQG	TTCEAILCTL	TAARDRVINK	IGRENISKII	VYGSDQTHCA	LQNAAQIVOI	DVKNFRAIKT	TKSSSYGLSP	DSUMAQINSD
SolloSGN	GGGVIQG	TCEATICTL	TAARDRVINK	IGRENISKUI	VYGSDOTHCA	LONAAQIVGI	DVKNFRAIKT	TKSSSYGLSE	DSIMAQINSD
DEFSTGQ	GGGVIQG	LASIS VIEVE	VAARDKIIRT	VERSALPKIN	TMASDOTHSS	LORACQIACL	NEELCELLKE	DESTNEALS	DVISEALSND
Shipespass	GCCCVIIOC	DTC SOLUTION	TOWDERMINK	TOPENTNEIN	TTASDOTTSS	LOGAROTACI	NEWNELATAN	SKATNEGLSE	NSPOSTILAD
SplpsGS	GGGVILOG	TSCEATIONT	TAARDRKINK	TCREHTGRIN	VYGSDOTHCA	LONAAOVAGI	NEKNEDATKO	FKENSEGLSA	ATUREVILED
SYLESGT	GGGVILOG	TTCEAILCTL	TAARDRKINK	ICREHICRIV	VYGSDOTHCA	LONAAOIAGI	NPKNFRAVKI	FKANSFGLAA	STEREVILED
SELESSDONA	GSSGGGVIQG	TTCEAILCTL	TASRDKMUNK	IGRENINKIW	VYASDOTHCA	LOKAAQIAGI	NEKNERALAT	SKATDFGLSP	QAULSTILAD
SALASSDGSS	GGGGVILQG	TTCEAILCTL	TAARDKMINK	IGRENINKIW	VYASDOTHCA	LOKAAQIAGI	NRKNFRAIAI	SKATNFGLSP	NSIQSTILAD
SELESGT	Geevnõe	TSCEAILCTL	TAARDRKUNK	IGREHIGRLV	VYGSDQTHCA	LQNAAQVAGI	NEKNYRAVKI	FKANSFGLAA	ATOKEVILED
SALASTDGSS	GGGGVIIQG	TTOBAILCTL	TAARDKMUNK	IGRENINKLY	IYASDOTHCA	LONAAQIAGI	NEKRVRAIKT	SKATNFGLSE	NSPOSTILAD
SALASSDGSS	GGGGVIIQG	TO MAIN COM	TAARDKMINK	IGRENINKOW	VYASNOVIECA	LORAAQIACH	NEKNVEAIKO	SKATNFGLSE	NSIQSAILAD
SDLDSGG	GGGVIIQG	TTCFATICAT	VAARDKNIERO	HEMONI GRIM	WCSDOTHSA	LOBARTACI	DEKNEDATER	TESSNEELCE	KRUESALLIU
SalasGG	GGGVIIQG	TTOPATIOTI	VAARDKNIFRO	HEMDNIGKIW	VYCSDOTHSA	LOBAAKTAGI	DEKNEDATEU	TESSNEELCE	KRUESATLYD
SalaSGG	GGGVIQG	TOPAIDCOL	VAARDKNIRO	HEMDNIGKLV	VYCSDOTHSA	LOGAAKIAGI	DEKNERALE	TKSSNFKLCP	KRUESAILYD
CELEASG	geevilõe	TTCEAMLCTI	VAARLOMLEK	ISRENFGNIV	VYASDOTHES	LKKAAHIAGI	DEGNERVIPI	IKANEYTLCE	KSURLAILND
SPLPSGN	GGGV [™] QG	TTCEAILCTL	TAARDRMINK	IGRENICKLV	VYGSDQTHCA	LQKAAQIAGI	HPNNFRAVPT	TKANDYGLSA	SAURSTILED
RoloTGN	GGGVIQG	TTOPAMICTI	TAARDOMISK	IGRENIGKLV	VY <mark>GSDQTH</mark> SA	VARAAKIVGI	DEKNFRAIKT	NKSTSFGLSP	ESURIAITKD
TEMESGT	GGGVIQN	TSDSIDVTL	IAARDRADDA	VGAENMHKLV	VYGSDQTHST	FARVCKLACV	SPANIRALPI	SVDANFSLSP	QLURRAVEAD
ToMoSGT	GGGVIIQN	TSDSINVIL	144ARDRAIDA	VGAENMHKLV	VYGSDQTHST	FANVCKLAGV	SPANICALP	SVDANFSLSE	QLURRAVEAD

TDC1 Actaea racemosa
TDC2 Actaea racemosa
partial TDC Actaea racemosa
TDC1 Camptotheca acuminata
TDC2 Camptotheca acuminata
TDC1 Capsicum annuum
TDC2 Capsicum annuum
TDC Catharanthus roseus
TDC Mitragyna speciosa
TDC Ophiorrhiza prostrata
TDC_Ophiorrhiza_pumila
TDC_Rauvolfia_verticillata
TDC_Tabernaemontana_elegans
TDC_Vinca_minor
TYDC1a_Arabidopsis_thaliana
TYDC1b Arabidopsis thaliana
TYDC1c Arabidopsis thaliana
TYDC1d Arabidopsis_thaliana
TYDC Argemone mexicana
TYDC_Aristolochia_contorta
TYDC_Citrus_aurantium
TYDC1_Citrus_reshni
TYDC2 Citrus reshni
TYDC_Citrus_reticulata
TYDC Citrus sinensis
TYDC1_Medicago_truncatula
TYDC2_Medicago_truncatula
TYDC1_Papaver_somniferum
TYDC2 Papaver somniferum
TYDC3 Papaver somniferum
TYDC5 Papaver sommiferum
TYDC6_Papaver_sommiferum
TYDC7_Papaver_somniferum
TYDC8_Papaver_sommiferum
TYDC9 Papaver somniferum
TYDC1 Petroselinum crispum
TYDC2 Petroselinum crispum
TYDC3 Petroselinum crispum
TYDC4 Petroselinum crispum
TYDC_Solanum_tuberosum
TYDC Thalictrum flavum
TYDC_Theobroma_cacao
Ciclev10014992m
orange1.1g010842m

310	320	330	340	350	360	370	380	390	400
			····						
VEAGETETYL CAUVE	TISSN AVDEV	GOLAD VANGE	GVWVH VDA GVWVH VDA	AYAGSAC	ICPEERHEID	GIERVOSLSL	SPECOLLTY:	DESCHWWROP	LLTKVEGCN
VEAGI TRIYL CARVE	TTSSN AVDEV	GO AD VANGE	GVINVH VDA	AYAGSAC	ICPEERHEID	GIERVDSLSL	SPERGLLTY	DCCCLWVKOP	ILITKV GCN
KAAGMVELYI CATVG	TTSTT AIDPL	SSTAD VANDY	GVNFH VDA	AYAGSAC	ICPEFRHYLD	GIERADSLSL	SP#KWLLSYL	DCCCLWVKSP	SLIVKA SID
VAAGMVPLYL CATVG	TTSTT AIDSI	SPLAD VANDY	GLWFH VDA	AYAGSAC	ICPEFRHYLD	GIERADSLSL	SP#K@LLSYD	DCCCLWVKRP	SVIIVKAIISID
VAAGIVELFL CATVG	TTSTT AIDPI	SEDGE LANEF	DIWLH VDA	AAYCGSAC	ICPEERQYED	CIDRANSFSL	SPERGLLSY	DCCCMWVKEP	SVIVKAIISON
MATDRIEFF CARLS	TTSST AVDPL	DENGE TANEF	SINHE VDA GINTH VDA	AYAGSAC	ICPEYRGIIN	CUSEAHSE'NM	S DELOGIT LA YU	DCTCLWWKOR	NTHITRAUTUN
VEDGEVELFI CANVO	TTSTT AIDPV	SE AD VONDE	NVAIH VDA	AYAGSAC	ICPEREOYLD	GIDRVDSLSL	SPERVILLCY	DCCCLWVKKT	DLUVKALAUN
VADGEVFIFL CATVG	TISTA AIDPV	SEVAK VANDF	NIWVH VDA	AYAGSAC	ICPEFROYLD	GIELVDSISL	SPREMLLCFL	DCCCLWICKRP	hlmvkal son
VADGLVFIFL CTTVG	ITSTA AIDPV	SEVAK VANDF	NIWVH VDA	AYAGSAC	ICPEFRQYLD	GIELVDSFSL	SP <u>HKØ</u> LLCFI	DCCCLWERKP	HLMVKAU SUN
IAAGIVPLFL CATLG	TTSST ATDEV	DSUSE IANEF	NIWMH VDA	AYAGSAC	ICPEEMHYLD	GIERVDSLSI	SPHERILLAY	DCICLWVKKP	HFILRAUTIN
VAAGPTELFL CAMLE	NUSTI ATDEV	NARAE DONEF	DIWIH VDA	AAYAGSAC	ICPEFRHY LD	GIGRVDSLSI	SPERMFLAY	Dereiwvkkp	QUITERAUTION
LAKCFIDEFT CARVE	INSSA AVIDEL	VPIGN TAKKY		AYAGNAC	TOPPYEKETD	CTIONADSENM	NARKOLFANO	TGSPIWWKDR	YSUIDAUKON
LAKCFIRFFI CANVG	TTSSA AVDPI	VPIGN ISKKY	GIWLH VDA	AYAGNAC	ICPEYRKFID	GIENADSFNM	NAHKELFANO	TCSPLWVKDR	YSTIDAUKON
LEAGLIPFFL CANVE	TTSST AVDPL	AAIGK IANSN	GI-VE VDA	AYAGSAC	ICPEYRQYID	GVIDTADSFNM	NARKOFLINE	DCSLLWVKDQ	DSUTLAUSIN
LEAGLIPFFL CANVG	TTSST AVDPI	AAFGK IANSN	GIWFH VDA	AYAGSAC	ICPEYRQYID	GVETADSFNM	na <mark>skø</mark> fltnf	DCSLLWVKDQ	DSUTLAUSUN
VEAGLIPLEV CPIVG	TTSST AVDPI	GPICE VAKEY	EMAVE VDA	AAYAGSAC	ICPEFRHFID	GVENADSFSL	NARKØFFTTI	DCCCLWVKDP	SAUVKAUSIN
VENERALEV CANVE	TISST AVDEL	GPUCE VAREH	GMWVEI VDA	AAYAGSAC	ICPEFRHFID	GVIDEADSFISE	NARKWLFTIC	DecelwykDP	GSIVKAUSIIN
VEVGLIPLEL CATLO	MATE AVDEL	KPUCD VAROF		AYAGSAC	TOPEFRHEID	CVIDGADSFSL	NACKOFFATU	DECELWIVEDP	RAIVSSISIN
VEVGLIPLFL CATIG	TTAIT AVDRI	KPICD VEKOF	GINVE VDA	AYAGSAC	ICPEFRHFID	GVEGADSFSL	NARKØFFATL	DCCCLWVKDP	RADVSSUSON
VEVGLIPLFL CATIG	TTAIT AVDEL	KPICD VAKOF	GINVH VDA	AYAGSAC	ICPEFRHFID	GVEGADSFSL	NA <mark>skø</mark> ffatl	DCCCLWVKDP	RAUVSSUSUN
VEVGLIPLFL CATIG	ITAIT AVDPL	KPUCD VAKQF	GINVH VDA	AAYAGSAC	ICPEFRHFID	GVEGADSESL	na sko ffati	DCCCLWVKDP	RAHVSSUSUN
IASCITPFFL CATVG	ITSST AVDPI	PADAK VTKPN	NIWLH VDA	AYAGSAC	ICPEYRHFID	GVEEADSFNM	NACINGFLINF	DCSVLWVKDR	SAUIQSUSIN
TASEFIEFEL CANVE	TTSST AVDEL	PAPAK VARTN	NIWFE VDA	AYAGSAC	ICPEABHLID	EVISEADSF'NM	NAPEROFLINE	DesvLwvkDR	SAFIQSISIN
TEACHTRLEY ORNES		SPICE VOKEY		AYAGSAC	ICPEIREID	GVISDADSEST.	NACOUFFT		SAUVKAUSUN
IEAGLIFLEV OPHVG	TTSST AVDRI	GPICE VAKEY	EMNVH IDA	AYAGSAC	ICPEFRHFID	GVIDEADSFSL	NARSOFFTT	DCCCLWVKDP	SSI VKAI SIN
IESGIVPLFL CATVG	TTSST AVDPI	GPUCE VAKOF	GINVH VDA	AAYAGSAC	ICPEFRHFID	GVEEADSESL	NA skø ffttl	DCCCLWVKDS	NAUVKAUSUS
IESGLVPLFL CATVG	TTSST AVDPI	GPUCA VAKLH	GINVH IDA	AYAGSAC	ICPEFR ^H FID	GVEDADSFSL	na skø fftti	DCCCLWVKDS	DSHVKAUSUS
IEAGLIPLEV CPIVG	ITSST AVDPI	GPICE VAKEY	EMWVH VDA	AYAGSAC	ICPEFRHFID	GVEEADSFSL	NACKOFFTTL	DCCCLWVKDS	SAUVKAUSIIN
IESCHVELFL CANVE	INSSI AVDEI	GPUCA VOKLY	GINVE IDI GINVE IDI	AYAGSAC	ICEDERHFID	GVIDADSFSL	NACIANFETTI	DECELWVKDS	DSILVKAIISIIS
LONGITULYL CARVE		DADTE VOKEY	GINVE IDA	AYAGSAC	ICPEDRAFID	CVISDADSESL	NACOUFLED	DECCHWWRDP	SAUTKSUSUY
LONGLIFLYL CANVE	TUSST TVDEL	PATTE VAKKY	DLINVH VDA	AYAGSAC	ICPEFROYLD	GVENADSFSL	NARSOFLTT	DCCCLWWRNP	SAFIKS STY
LONGLIPLYL CATVG	TTSST TVDPL	PAUTE VAKKY	DLWVH VDA	AYAGSAC	ICPEERQYLD	GVENADSFSL	NAHKØFLTTL	DCCCLWVRDP	SADIKSUSUY
LQNGLIPLYL CATVG	TTSST TVDPL	PAUTE VAKKY	DIWVH VDA	AYAGSAC	ICPEERQYLD	GVENADSFSL	na hko fltti	DCCCLWVRDP	SAUIKSUSTY
LKEGNVFLFL CATIG	TTATT SVDEL	RLUCE IAKEF	GINVH VDA	AYAGSAC	ICPEFQVFLD	CVENANSFSL	NARK	DCCCLWVKDP	SAUTNAUSUN
TEACHVELFL CANVE	DENSISIN AVIDET	GPUCK VASDY	SINVE VDA	AYAGSAC	ICHORODE HEID	CVIDNADSFSL	NAGEWFFTT	DOCOLWVKEP	SAULKAUSON
VEAGIVELEL CATUG	TTSTT AVDNU	EPHAE VENEY	GTINVE VDA	AYAGSAC	TOPPERHYLN	CURVDSFSF	SPEKVILLSY	DECCLWVKOP	GLUVKAUSUD
VEAGIVELFL CATVG	TTSTT AVDNV	EPLAE VANEY	GIŃVH VDA	AYAGSAC	ICPEERHYLN	CIERVDSFSF	SPEKWLLSYL	DECEMAROP	GLUVKAUSID

S9 of S11

TDC1_Actaes_racemosa TDC2_Actaes_racemosa partial_TDC_Actaes_racemosa TDC2_Camptotheca_acuminata TDC2_Camptotheca_acuminata TDC2_Capsicum_annum TDC2_Papaver_somniferum TDC3_Papaver_somniferum TDC3_Papaver_somniferum TDC3_Papaver_somniferum TDC3_Papaver_somniferum TDC3_Papaver_somniferum TDC3_Papaver_somniferum TDC3_Papaver_somniferum TDC3_Papaver_somniferum TDC3_Papaver_somnifer

TELLA, T. TELLAS, VALUE TALLET, T. A. T.	410	420	430	440	450	460	470	480	490	500
PERINAL PERINAUTI DENGGGGE GALARDAYES SECARDAYES ISOURARES ISOURAR		· · · · · · · ·	· · · · · · · ·		· · · · · · · ·					
PERFORMENDE TELNAVUELE DANGESE GALERADIVE STOVARDSH TSDUARDAM TOTALS TO VOLUM UNDER TELLAS DE LETTAL DE LE	DEFENSE-NP	TELNSVUDYR	DWOVGYGRRF	RALRIVEVER	SYGVANDOSH	TREDURMEN	NOCENT OF DE	DDIVIEROBA	IVCERLTLS-	DE
PETRON-OP SESSAVEDED ENOUGEGERE KALRENDYN STOVANASH ENTDYCAAM TEEFENSTE PETRORUS I VERTAG I G PETRON-TA SEGAVEDE ENGLEGENE KALRENDYN STOVANDSH ESDIGAAM TEEFENSTE PETRORUS I VERTAG I VERTAG G PETRON-TA SEGAVEDE ENGLEGENE KALRENDYN STOVANDSH ESDIGAAM TEEFENSTE PETRORUS I VERTAG VERTEG PETRON-TA SEGAVEDE ENGLEGENE KALRENDYN I VELTEROAT ENHLOLAN FELTVARE PETRORUS I VERTEGEN VERTEG SEGAVEDE ENGLEGENE KALRENDYN I VELTEROAT SELMENTE I VELTEROAT ENHLOLAN FELTVARE FELTVERENS I VERTEGEN VERTEG SEDENVEN ENGLEGENES SALRENDYN I VELTEROAT SELMENTE I VELTEROAT I STOVANDSH ESDIGAAM TEGUNSEPE FELTVERENS I VERTEGEN SEDENVEN ENGLEGENES SALRENDYN I VELTEROAT SELMENTE STOVANSH I SEDVAAM TEGUNSEPE FELTVERENS I VERTEGEN SEDENVEN ENGLEGENES KALRENDYN STOVANSH I SEDVAAM TEGUNSEPE FELTVERENS I VERTEGEN SEDENVEN ENGLEGENES KALRENDYN STOVANSKE SELMENTER STOVANSH I SEDVAAM TEGUNSEPE FELTVERENS I VERTEGEN SEDENVEN ENGLEGENES KALRENDYN STOVANSKE SELMENTER STOVANSH I SEDVAAM TEGUNSEPE FELTVERENS VERTEG PETRON-OS SEDENVEN ENGLEGENES KALRENDYN STOVANSKEH I SEDVAAM TEGUNSEPE FELTVERENS I VERTEGEN SEDENVER ENGLEGENES KALRENDYN STOVANSKE SELMENTER STOVANSH I SEDVAAM TEGUNSEPE FELTVERENS I VERTEGEN PETRON-OS SEDENVER ENGLEGENES KALRENDYN STOVANSKEH I SEDVAAM TEGUNSEPE FELTVERENS I VERTEGEN SEDENVER SENS VERTEGENES KALRENDYN STOVANSKEH SENSEN SEDENVER ENGLESSENS SALRENDYN STOVANSKEH SENSENSKEN SENSENSKEH SENSENSKENSENS I VERTEGEN SEDENVER SENSENSKENSENSKENSKENSKENSKENSENSENSENSENSENSENSENSENSENSENSENSENSE	POETKNNP	TELNSWOVI	DWOVGY GERE	DALRIMEVED	SVCVANDOSH	TISSDVRMARM	DOGEVKSEPE		IVORRITIS-	DE
PERDEN- BY SENSIVER DECEMPTED ALL DECEMPTED SELECTION OF EXEMPLE ALL DECEMPTED SELECTION OF ALL DECEMPTED ALL DECE	DDYI KN-OP	SESKSWUDY	DWOVGTGERE	KALRUZEVME	SYCVANDOSH	INTOVOM MM	POFVKSDPR	BOILVEDVIS	LVGERLNEIS	G
TRUCKAL SERVICE SECONDER SELECTION OF SELECTION OF CONTRACT SECONDAL SECONDAL SECONDER SECOND	PEYLKNKP	SESNSVUDFK	DWOVGTGRRF	KALRIMFVMR	SYGVANDOSH	IRSDIOMAKM	DEFVNSDPR	BEIVVERVES	IVCERLNEES	к
TEREN	PEYLRNKR	SEHGS <mark>VVD</mark> YK	DWQIGTCRKF	kslr <mark>lw</mark> limr	SYGVANLQSH	IRSDVRMAKM	PDGLVRSDPY	FEVIVERRES	IVCFRFNED-	KE
TYPENO SULDKVDF NOTATORS BELKULTER SUVARISH ISSUARGA DEWERSES FITVERNS INFORMATING NOTATORS AND	PEYLKNKA	SQGNLVVDYK	DWQVPLGRRF	RSLKDMMVLR	LYGLEKLQAY	IRNHIQLAKL	NPKLVAQDQR	BEIVTERKES	LVCFRLLEPP	SN
TELENRA SEPDSVDYL UNCIGUESE BALRUNDE GEWANNSH ISSUVAN FORVESES EDWITTERS LVOFFINGS- GO FEVENRA SEPDSVDYL UNCIGUESE BALRUNDE SVCHWARH ISSUVAN FORVESES FEITVERAA LVOFFINGSK GY FEVENRA SEPDSVDYL UNCIGUESE BALRUNDE SVCHWARH ISSUVANAM FOLVESES FEITVERAA LVOFFINGSK GY FEVENRA SEPDSVDYL UNCIGUESE BALRUNDE SVCHWARH ISSUVANAM FOLVESES FEITVERAA LVOFFINGSK GY FEVENRA SEPDSVDYL UNCIGUESE BALRUNDEL SVCHWARH ISSUVANAM FOLVESES FEITVERAA LVOFFINGSK GY FEVENRA SEPDSVDYL UNCIGUESE BALRUNDEL SVCHWARH ISSUVANAM FOLVESES FEVENDERIS LVOFFING	PEYLKNKQ	SDLDKVVDFK	NWQIATGRKE	RSLKLWLILR	SYGVVNIQSH	IRSDVAMCKM	FEEWVRSDSR	BEIVVERNES	LVCFRLKPD-	
22171	PEYLRNKR	SEFDS <mark>VVD</mark> YK	DWQIGTGKRF	RALRUNIVMR	CYRVANDQSH	IRSDVQMAKM	EDGFVKSDPR	DEMIVERAES	LVCFRLNES-	GG
PERFORMANCE SELDENDER ONCEGENGEN KALINGTUNG GENERAL KENNERNE ISDUGAAM PEDERAL PERFORMANCE PERFORMANCE AND	PEYLRNKR	SEFDGVVDFK	DWOIGTGRRF	KALRIMIVMR	SYGVENIKRH	ILSDVQMAKM	POGLVKSDPR	BOIIVERARA	IVCFRINEGK	GY
HELEN-TO SELDAVOFINA MCALARGES GALKGOLDE SUCCESSIONS INSULANDE SUCCESSIONS IN TOTALS IN THE ACCOUNTS INCOMENTS INCOM	PDYLRNKR	SEFDGVVDFK	DWQIGTGRRF	KALRUMLVMR	SYGVENDERH	ILSDVQM <u>-KM</u>	DGLVKSDPR	INDIIVERAINA	LVCERLNEGK	GY
PERTANA CONTROL OF ALL ALGORS CALLED TO SECONARDER AND ALL SECONARDER AND ALL ALL ALL ALL ALL ALL ALL ALL ALL AL	115Y1FR0113Q	SELDKWOFK	NYQIATGRKB	RALKUMLILR	SMCVSNIQSH	IR SDVAM, KM	DFARSOPR	13DVVVDRNI3S	LV(c) at LKA	
PERLEMENTAL SUBJUCTS AND ALGERS RELATIONS SUCCESSION DESCRIPTION OF A SUCCESSION OF A SUCCESSI	PDY KN NO	SELDKWOFK	NOTATORKS	RALKUTFILR	SWEVANDOSH	II-SDVAM-XM	GFVRSDPR	19DVVVD; AlaS	IVCERLKP	
PETER V SKRDYVIT DKULSESSER SIKERVAR LOSSERARY FORWARD AND AND AND AND AND AND AND AND AND AN		SULDRUVUER	NACTATORNA	URT KUCKAUTUR	INCOMPTI	TEDUNIN	NODYWAOUDC	A DV V VERNIAS	LUCHRENE AUTO	CD
PETERN	DIVIER - 13V	SKKDTWANY	DWOTSTSPER	DST.KUM2MAVLD	LNCSENURNE	TEDEVNIA	NDYVAOLPS		LWODEL ABYD	GD
PEREN WAS SOANDYDY DWCHASKE SIKUMAUS HOSTDASI INNHKLAS FOLVSOPN FERVIERIA LVCFRUEVX DE- PEREN A TESKOVDY DWCHASKE SKUMAUS HOVADANF ISSUANKE FOLVSOPN FERVIERIA LVCFRUEVX DE- PEREN A TESKOVDY DWCHASKE SALKUMAUS HOVADANF ISSUANKE FERVIERIA UVCFRUEVX DYFREG TESKOVDY DWCHASKE SALKUMAUS HOVADANF ISSUANKE FERVIERIA UVCFRUEVS FERVIERIA VCFRUESS FERVIERIA VCFRUESS FERVIERIA TESKOVDY DWCHASKE SIKUMAUS HOVADANF ISSUANKE FERVIERIA TESKOVDY DWCHASKE SIKUMAUS HOVADANF FERVIERIA TESKOVDY DWCHASKE SIKUMAUS SICTADANF FERVIERIA TESKOVDY DWCHASKE SIKUMAUS SICTADANF FERVIERIA TESKOVDY TOCHASKE SIKUMAUS SICTADANF FERVIERIA FERVIERIA FERVIERIA FERVIERIA	PERTKINKA	SOANLANDYIS	DWOTPLGERE	BSLKIMMUR	LVCSETUKSY	TENHTKLASE	PROLVSOLPN	DETVIDETIA	INCERTMENT	DE
PERSIN	DOFT KN KA	SOANLWYDYK	DWOIPLGERE	RSLKUMMULB	LYCSETTKSY	IRNHIKLARE	POLVSO PN	NOIVTORIDA	LVORREVEVK	DE
DEUCHRA TESROVUDYG UKCILLERER BALKULGULG SUCYSMURNF LETHUKKATT DEULAMSKE FEVUVERTA MUCTELLAG G DEUCHRA TESROVUDYG UKCILLERER BALKULGULG SUCYSMURNF LETHUKKATT DEULAMSKE FEVUVERTA MUCTELLIAG G PEVERRA TESMAVUDYG UKCILLERER BALKULGUUG NUCYANURHF LESHVNARL FELLVSGKE FEVERCHA VUCFEVSSEP VL FEVERRA TESMAVUDYG UKCILLERER BALKULGUUG NUCYANURHF LESHVNARL FELLVSGKE FEVERCHA VUCFEVSSEP VL FEVERRA TESMAVUDYG UKCILLERER BALKULGUUG NUCYANURHF LESHVNARL FELLVSGKE FEVERCHA VUCFEVSSEP VL FEVERRA TESMAVUDYG UKCILLERER BALKULGUUG NUCYANURHF LESHVNARL FELLVSGKE FEVERCHA VUCFEVSSEP VL FEVERRA TESMAVUDYG UKCILLERER BALKULGUUG NUCYANURHF LESHVNARL FELLVSGKE FEVERCHA VUCFEVSSEP VL FEVERRA TESMAVUDYG UKCILLERER BALKULGUUG NUCYANURHF LESHVNARL FELLVSGKE FEVERCHA VUCFEVSSEP VL FEVERRA TESMAVUDYG UKCILLERER BALKULGUUG NUCYANURHF LESHVNARL FELLVSGKE FEVERCHA VUCFEVSSEP VL FEVERRA TESMAVUDYG UKCILLERER BALKULGUUG NUCYANURHF LESHVNARL FELLVSGKE FEVERCHA VUCFEVSSEP VL FEVERRA TESMAVUDYG UKCILLERER BALKULGUUG NUCYANURHF LESHVNARL FELLVSGKE FEVERCHA VUCFEVSSEP VL FEVERRA TESMAVUDYG UKCILLERER BALKULGUUG SUCTANURFF LESHVNARL FELLVSGKE FEVERTA MUCFELLSPP NS FEVERRA TESMAVUDYG UKCILLERER BALKULGUUG SUCTANURFF LESHVNARH FOLLUNGGKE FEVERTA MUCFELLSPP NS	PEYLRNKA	TESKOVVDYK	DWOIALSERF	RSMKUWMVLR	NYGVANURNF	LESHVKMAKO	GLIASONE	BEICVERTEA	MVCFRLLPPK	STRDNRVREE
DEPENDENT TESMOVUNG DICITISERS BELKUNDUS NOVANDARP LESUNARD DELVSGES FEIVEREA WOEFVESSP VL PENDENT-A TESMOVUNG DICITISERS BELKUNDUS NOVANDARP LESUNARD DELVSGES FEIVEREA WOEFVESSP VL PENDENT-A TESMOVUNG DICITISERS BELKUNDUS NOVANDARP LESUNARD DELVSGES FEIVEREA WOEFVESSP VL PENDENT-A TESMOVUNG DICITISERS BELKUNDUS NOVANDARP LESUNARD DELVSGES FEIVEREA WOEFVESSP VL PENDENT-A TESMOVUNG DICITISERS BELKUNDUS NOVANDARP LESUNARD DELVSGES FEIVEREA VOEFVESSP VL PENDENT-A TESMOVUNG DICITISERS BELKUNDUS NOVANDARP LESUNARD DELVSGES FEIVEREA VOEFVESSP VL PENDENT-A SOUNDED DICITISERS BELKUNDUS NOVANDARP LESUNARD DELVSGES FEIVEREA VOEFVESSP VL FEIVENA SOUNDED DICITISERS BELKUNDUS LIGUEDENTH TESHAADU DELVSGES PEIVEREA VOEFVESSP VL PENDENT-A SOUNDED DICITISERS BELKUNDUS LIGUEDENTH DESUNARD DELVSGES PEIVEREA VOEFVESSP VL FEIVEN	PEYLRNKA	TESROVVDYK	DWOIALSRRF	RALKLØIVLR	SYGVSNURNF	LETHVKMAKT	FEGLLAMOKE	BEVVVERTEA	MVCFRLLPAG	G
TEREN	PEYLKNKA	TESMOVVDYK	DWQITLSRRF	RSLKLWFVIR	NYGVANLRHF	LESHVNMAKL	FERLVSGOKR	DEIVFECHDA	VVCERVSESP	VL
ERVEN	PDYLKNKA	TE SMHVVDYK	DWQITLSRRS	RSLKLWFVIR	NYGVANURHF	LRSHVNMAKL	PERLVSGOR	DEIVERCHEA	VVCHRVSESP	VL
22170-7A TESMOVUTO DACITISEE BELKUNDUE NGCANDRIP ISHVNARI DELVSGER ETUPECHA VGEVESSE VI PEVINA TESMOVUTO DACITISEE BELKUNDUE NGCANDRIP ISHVARI DELVSGER ETUPECHA VGEVESSE VI PEVINA TESMOVUTO DACITISEE BELKUNDUE NGCANDRIP ISHVARI DELVSGER ETUPECHA VGEVESSE VI PEVINA SGENTUITY DACIFIER BELKUNDUE LGIGEGENH ISHTANY DELVSGER ETUPECHA SGENTUITY DACIFIER BELKUNDUE LGIGEGENH ISHTANY DELVGER PEVINETS LVGETEIGP NS PEVINA TISKOUDY DACIFIER BELKUNDUE GOUTHONP ISHVARI DELVGER FIVORTA MOTELLEP NS PEVINA TISKOUDY DACIFIER BELKUNDUE GOUTHONP ISHVARI DELVGER FIVORTA MOTELLEP NS PEVINA TISKOUDY DACIFIER BELKUNDUE GOUTHONP ISHVARI DELGGAR FIVORTA MOTELLEP NS PEVINA TISKOUDY DACIFIER BELKUNDUE GOUTHONP ISHVARI DELGGAR FIVORTA MOTELLEP NS	PEYLKNKA	TE SMQVVDYK	DWQI TLSRRF	RSLKLØFVIR	NYGVANLRHF	LRSHVNMAKL	BERLVSGOKR	REIVFECHEA	VVCERVSESP	vr
221781 A TESMOVUTI ONCITISERE RELIGIOUE NEGANDRIF LESHWARAL SELLANGER ETTYPECHA VCETEVESSE VL DEVIN A SORNVIDTO ONCITISERE RELIGIOUE VCADERIF INTALAAV ELUNGER ETTYPECHA VCETEVESSE VL DEVIN	DEYLKN-KA	TE SMQ VVD YK	DWQI TLSRRF	RSLKUMFVIR	NYGVANLRHF	LRSHVNMAKL	BERLVSGOKR	DEIVERCHDA	VVCFRVSESP	VL
PERTAINAN SOENNUTED ONCIPLORES RELEARING WEI DELECOTHE ISBUARY PELUVOETE EXVIVERTS LOCHTLEDO IS- DEVEN-VA SOENNUTED ONCIPLORES RELEARING DE LOCIECOTHE ISBUARY PELUVOETE EXVIVERTS LOCHTLEDO IS- FEREN-VA ISSOUNDED ONCIALSERE REMEMBERTS SECTIONER LA FERENCIA FERENCIA FERENCIA INOTELLER I- FEREN-VA ISSOUNDE ONCIALSERE REMEMBERTS SECTIONER LA FERENCIA FERENCIA INOTELLER I- FEREN-VA ISSOUNDE ONCIALSERE REMEMBERTS SECTIONER LA FERENCIA FERENCIA FEREN-VA ISSOUNDE ONCIALSERE REMEMBERTS SECTIONER LA FERENCIA INOTELLER INOTELLER ISSOUNDE FEREN-VA ISSOUNDE ONCIALSERE REMEMBERTS SECTIONER LA FERENCIA INOTELLER INOTELLER ISSUE FEREN-VA ISSOUNDE ONCIALSERE REMEMBERTS SECTIONER LA FERENCIA INOTELLER INOTELLER INOTELLER ISSUE FERENCIA-VA ISSOUNDE ONCIALSERE REMEMBERTS SECTIONER LA FERENCIA INOTELLER INOTICELER INOTELLER INOTELLER INOTELLER INOTELLER INOTELLER INOTICELER INOTELLER INOTICILIERI	PEYLKNKA	TESMQVVDYK	DWQITLSRRF	RSLKLWFVIR	NYCVANURHF	LRSHVNMAKL	EDRLVSGDKR	DEIVFECHEA	VVCERVSESP	VL
PETRANA SQGANATITO ONCIPLORE ESTRATIVE DECISORETH TANTADAY PETRONOTE DEVICETS LOCATED SUCCESSION OF A SQUARETS A SQUARETS SQUARETS A SQUARETS SUCCESSION OF A SQUARETS A S	DDFI KNKA	SQENTVIDYK	DWOIPLGRRE	RSLKUMMVMR	LYCLEGURTH	ICSHIAL/VY	DELVVOOTE	HKVVADRTHS	LVCERLLEPO	NS
PETRAN-A TUSKOULUT DACAASSES TESKUTUUS SECTADUTT ISSUARAT JOLLOGIA PETRUTA MOTELUSA IS- PETRAN-A TUSKOULUT DACAASSES TESKUTUUS SECTIONEN ISSUARAT JOLLOGIA PETRUTA MOTELUSA IS- PETRAN-A TUSKOULUT DACAASSES TESKUTUUS SECTIONEN ISSUARAT JOLLOGIA PETRUTA MOTELUSA IS- PETRAN-A TUSKOULUT DACAASSES TESKUTUUS SECTIONEN ISSUARAT JOLLANGE PETRUTA MOTELUSA IS- PETRAN-A TUSKOULUT DACAASSES TESKUTUUS SECTIONEN ISSUARAT JOLLANGE PETRUTA MOTELUSA IS- PETRAN-A TUSKOULUT DACAASSES TESKUTUUS SECTIONEN ISSUARAT JOLLANGE PETRUTA MOTELUSA IS- PETRAN-A TUSKOULUT DACAASSES TESKUTUUS SECTIONEN ISSUARAT JOLLANGE PETRUTA MOTELUSA IS- PETRAN-A TUSKOULUT DACAASSES TESKUTUUS SECTIONEN ISSUARAT JOLLANGE PETRUTATA MOTELUSA IS- PETRAN-A TUSKOULUT DACAASSES TESKUTUUS SECTIONEN ISSUARATI JOLLANGE PETRUTATA MOTELUSA IS- PETRAN-A TUSKOULUT DACAASSES TESKUTUUS SECTIONEN ISSUARATI JOLLANGEN PETRUTATA MOTELUSA IS- PETRAN-A TUSKOULUT DACAASSES TESKUTUUS SECTIONEN ISSUARATI JOLLANGEN PETRUTATA MOTELUSA IS- PETRAN-A TUSKOULUT DACAASSES TESKUTUUS SECTIONEN ISSUARATI JOLLANGEN PETRUTATA MOTELUSA IS- PETRAN-A TUSKOULUT DACAASSES TESKUTUUS SECTIONEN ISSUARATI JOLLANGEN PETRUTATA MOTELUSA ISAN ISSUARATI JOLLANGEN PETRUTATA MOTELUSA ISAN ISSUARATI JOLLANGEN ISSUARATI JOLLANGEN PETRUTATA MOTELUSA ISAN ISSUARATI JOLLANGEN	DOYN KN NA	SQGNMVIDYK	DWOIPLGREE	RSLKIMMR	LWCLEGORTH	I5NHIAL AY	DELVGODTR	IaKVVAL, TIAS	LVCBRILLEPP	NS
PERFORMANT ALTERGUNDING DAGIALSENE GEMANNANG SUGUNDART DESUANTAT DEGLAGARE PETUVERTA MORFLIGEN INTERNASS PERFORMANTA TESRGUNDING DAGIALSERE REMAINANG SUGUNDAR DESUANTAT DEGLAMERE PETUVERTA MORFLIGEN INTERNAS PERFORMANTA TOSKOVIDING DAGIALSERE REMAINING SUGUNDARTE LESUKANEN DEGLAMERE PETUVERTA MORFLIGEN IF PERFORMANTA TESRGUNDING DAGIALSERE REMAINING SUGUNDARTE DESUMANTE DEGLAMERE PETUVERTA MORFLIGEN IF PERFORMANTA TESRGUNDING DAGIALSERE REMAINING SUGUNDARTE DESUMANTE DEGLAMERE PETUVERTA MORFLIGEN IF PERFORMANTA TESRGUNDING DAGIALSERE REMAINING SUGUNDARTE DESUMANTE DEGLAMERE PETUVERTA MORFLIGEN IF PERFORMANTA TESRGUNDING DAGIALSERE REMAINING SUGUNDARTE DESUMANTE DEGLAMERE PETUVERTA MORFLIGEN IF PETURENANTA TESRGUNDING DAGIALSERE REMAINING SUGUNDARTE DESUMANTE DEGLAMERE PETUVERTA MORFLIGEN IF PETURENANTA TESRGUNDING DAGIALSERE REMAINING SUGUNDARTE DESUMANTE DEGLAMERE PETUVERTA MORFLIGEN IF PETURENANTA TESRGUNDING DAGIALSERE REMAINING SUGUNDARTE DESUMANTE DEGLAMERE PETUVERTA MORFLIGEN IF	DDY KINKA	TDSROWIDYR	DWOTAL SRRF	RSMKUVLVLR	SMCLANDRTF	LRSHVKMARH	DOGLIGMONE		MVOIRLEIAA	1F
PETRON	DOVIDN 37	TESROVUDIA	DWOTALSRR	DOMESTIC:	SNEVINDENE	LOSHVID	DOGLICALDE	NOT TURNING	MUCHRELISPK	TUKUCGE
provena, toxonitata ancialisere bankarinate socialisere losuvante focilisere presentationes proventata normanes Bandaa, toxonitata ancialisere bankarinate socialisere losuvante politikasos priverada, morphiler 11 Bandaa, toxonitata ancialisere bankarinata socialisere losuvante collumbati politikera	PEYLKN-KA	TDSKOWIDYK	DWOTALSERE	RSMKIMITALR	SYCVANUESE	LESHVKMAKH	DGLTAMDER	DOTVVDNTDA	MVCEPLKEAA	IF
DEMURNKA TESROVODIN DAGIALSERE ESIKUMAVUR SYGITNURNE IRSHVKAAN FEGLIGADGE FEITVERTSA MVCFELLEPT TIKVY-D PENDANKA TESKOVIDYN DAGIVLSERE ESMKUMUUR SYGVANDERF IRSHVKMARI FOGLIVMONI FEIVVERTSA MVCFELLEPA IF	PPYLEN KA	TDSKOWIDYK	DWOTALSERF	RSMKUWLVLR	SYCIANDRTF	LESHVKMAKH	DOGLIGMONR	APTORIVIER	MVORLKISAA	IF
DEVERNRA IDSKOTIDIN DEOIVLSERE ESMEMILILE SYCKANDETF LESEVEMARL DOSLIVEDNI DEIVVERTA MUCHELKEAA IF	PEYLENKA	TESROVVDYK	DWOILALSRRF	RSLKL/MVLR	SYGITNLENF	LESHVKMAKT	DEGLIGMOGR	BEITVERTEA	MVCFRLLPPT	TIKVY-D
	PEYLKNKA	TDSKQVIDYK	DWQIVLSRRF	RSMKLŴLVLR	SYGVANLETF	LRSHVKMAKL	PQGLIVMONI	REIVVERTEA	MVCERLKEAA	IF
ANYTENKA TESKONIDYN DMOIALSEN ESMEMININE SMEVANERTF LESHVEMARH EQGIMGMONE PEIVVERTEA MVOURLEEAA IF	ABYLKNKA	TESKQVIDYK	DWQIALSRRF	RSMKLWLVLR	SYGVANURTF	LESHVKMAKH	EQGLMGMDNR	BEIVVERTEA	MVCERLKEAA	IF
PERIKNNA SETNKWUDIK DWOIMLSRRE RALKIMFULT SYCVGQUREF IRGHVGMAKY PEGLVGMONT BEVVAERLES MVCFRIKESA MIG	PDFLKNNA	SETNKVVDYK	DWQIMLSRRF	RALKLØFVLR	SYCVGOUREF	IRGHVGMAKY	EDGLVGMDNR	BEVVAPRIES	MVCERIKESA	MIG
REFEXNNA SETNKVVDYK DWOIMLSRRE RALKEMFYLR SYGVGOIREF IRGEVGMAKY REGLVNMOKR REVVARRIES MVOFRIKESA MIG	PDFLKNNA	SETNKVVDYK	DWQIMLSRRF	RALKLWFVLR	SYGVGQUREF	IRGHVGMAKY	BEGLVNMOKR	BEVVARRIES	MVCERIKESA	MIG
PEPTANNA SETNAVVDYA DNOIMISRAF RALKIMPVIR SYGVGQIREF IRGHVGMAN PEGIVGIZR FEVVAPRIES MVGFRIKESA MIG	PDFUKNNA	SETNKVVDYK	DWQIMLSRRF	RALKLØFVLR	SYGVGQUREF	IRGHVGMAKY	BPGLVGLCKR	PEVVAPRIES	MVOFRIKESA	MIG
19-19-19/INNA SETNKWAPYA DAGIMLSARA KALAMPULA SAGVGOREF IEGIVGMARY FEGIVGIARA FEGIVGIARA FEGIVGIARA	DOFT KN NA	SETNKVVDYK	DWOIIMLSRRF	RALKUMFVLR	SMGVGQUREF	DRGHVGMARY	BIRGLVGLDKR	BEVVAERLES	MVCERIKESA	MIG
1990 PRN-3A HELNOVIDER DEGLASSERS SALENDILVER SNOVTMERNI ERSEVINGAR 1996 DATERS 1931 FVERRAA WORTSISTV LS	BBCIERNKA	TELNOVIDYR	DWOTALSERE	RALKINEVER	SMCVTNICRNL	113SHVNM-18H	JOGLVATOKR	ap I FVIDRKAA	MVCORISELV	LS
19 JURNATINA LESSINGANING DURLASSKE KANNUTLULE SNEVANJENE LESEVENEAN DEGIALDAR ISINVERTA MORELLEFE SPLIK	DEFICIENCE KA	TESHQWVDYK	DWOILALSERE	ROAMING WILVER	SHOVANDENE	LESHVKMAND	STORE I ALDER	NOT VUSICIA	THE REAL PR	SPLIIK
MALENT W BUSKEWEIN DEVENUUT LOCKE WEINELLE SECTIONES DESERVATION FOLLASSER FEVENTISE TROTTELESSE LC	DEVICENCE OD	SPSNOVUDIN	DIANGTORRE	K GT DUSCHAUTUS	SNOUTNIOGU	THEFT	NOTING DI	NOT VURDED A	INCOMENTARY D	PC
PERTEN-SP SESNSYDER DWOVGTORD KELENTALE SWOVINGSH IRSDIRAM PEGFUKSDE FELVERED A WORLNEYP H	PETERNKP	SESNSWOFK	DWOVGTGERE	KSLRMMULS	SYCVLNDOSH	IRSDIRLARM	POFVKSDPR	INDIVUS RHIA	LVORELNEYP	н

TDC1 lates reasons	
TDC2 Actaes racemosa	
partial TDC Actaea racemosa	
TDC1 Camptotheca acuminata	
TDC2 Camptotheca acuminata	
TDC1 Capsicum annuum	
TDC2 Capsicum annuum	
TDC Catharanthus roseus	
TDC Mitragyna speciosa	
TDC Ophiorrhiza prostrata	
TDC Ophiorrhiza pumila	
TDC Rauvolfia verticillata	
TDC Tabernaemontana elegans	
TDC Vinca minor	
TYDC1a Arabidopsis thaliana	
TYDC1b Arabidopsis thaliana	
TYDC1c Arabidopsis thaliana	
TYDC1d Arabidopsis thaliana	
TYDC Argemone mexicana	DO
TYDC Aristolochia contorta	
TYDC_Citrus_aurantium	
TYDC1_Citrus_reshni	
TYDC2_Citrus_reshni	
TYDC Citrus reticulata	
TYDC_Citrus_sinensis	
TYDC1_Medicago_truncatula	
TYDC2_Medicago_truncatula	
TYDC1_Papaver_somniferum	
TYDC2_Papaver_somniferum	NC
TYDC3_Papaver_somniferum	NO
TYDC5_Papaver_somniferum	
TYDC6_Papaver_somniferum	
TYDC7_Papaver_somniferum	NO
TYDC8_Papaver_somniferum	
TYDC9_Papaver_somniferum	
TYDC1_Petroselinum_crispum	
TYDC2_Petroselinum_crispum	
TYDC3_Petroselinum_crispum	
TYDC4_Petroselinum_crispum	
TYDC_Solanum_tuberosum	
TYDC_Thalictrum_flavum	T
TYDC_Theobroma_cacao	
Ciclev10014992m	
orange1.1q010842m	

510	520	530	540	550	560	570	580	590	600
	ч	EPELVELFNQ	DILLDRVNSGC	KMYMTUTVIG	GTYVERFAVG	STATKEH IVS	AAVNLIKETA	DMLVGEC	
	Ү	EPELVELFNR	DLLDRVNSGC	KMYMTHTVIG	GTYVLRFAVG	STATKEHNVS	TAUNLIKETA	DMLVGEC	
	У	EPELVELFNR	DILIDRVNSGG	KMYMTUTVIG	GTYVLRFAVG	STARKEHINS	AANNLIKET-		
	s	DPTGTEAL	KLLDWVNSTC	RVYMTHTKVG	GIYMLRFAVG	ATLIEKRHVS	SAWKLIKEGA	DVLLKED	
	s	DPCNTELLAR	KILLEWVNSTC	QVAITHTKVG	GVYMLRFAVG	ATIMEEHRVS	AANKLIREGA	DALLCS	
	¥	EPAYTELLAK	RUDNVNSTC	RVMMTHTVAG	GIYMLRFAVG	ATFEDRULI	CANKLIKDCA	DALLRNCQ	
		-EDYANKLNH	NUIDSVNSTG	KLFISUTLLS	DKY I LRFAVG	APHDEERUIV	GANKVLODEA	ATLLSKC	
	v	SSLHVEEVNK	KILDMINSTC	RVYMTUTIVG	GIYMLRLAVG	SSLIEEHHVR	RVODLIQKLT	DDLLKEA	
	s	NEADLELLAK	KILLDRVNSTG	RTYMTUTKAG	EVYLLRFAVG	ATLIEDRIVY	AMELIKQCA	DAVL-KENVL	D
	D	DEIDKEILNK	ELLDLINSTG	RAYMTHTKAG	GIYMLRFAVG	TTLIEEHHVY	AMELIKECT	DASLTKTNII	ESRANPQ
	D	DEIDKEILNK	ELLDLINSTG	RAYMTHTKAG	GIYMLRFAVG	TTLTEEHHWY	AMELIKECT	DASLTKTNII	E
	<u>L</u>	PGSDVEALNK	KLIDMINSTG	RVYMTHTIVG	GIYMLRLAVG	SSLTEEHHVR	AVTELIKELA	NDLLKEA	
	F	PGSDVEALNK	KLUDKLNSTC	RVYMTHTIVG	GIYMLRLAVG	SSLIEERHVR	AVDELIKELA	NDSLKEA	
	L	PGSDVEILNK	KENDMENSTC	RVYMTHTIVG	GIYMLRLAVG	SSLTEEHHVR	AVZELIKKLA	DDLLKEA	
		-EDQCNERNR	ETTAAVNSTC	KIFISTALS	CKFVLRFAVG	APLTEEKHVT	EANOIIQKHA	SKFTRNDHY-	
		-EDQCNERNR	ELLAAVNSTC	KIFISUTALS	GKFVLRFAVG	APHIEEKHVT	EANQIIQKHA	SKFTRNDHY-	
		-EKKCNNRNR	ELLIDAVNSSC	KLFMSHTDLS	GKIVLRCAIG	APHNEEKHWK	EANKVIQEEA	SYLLHK	
		-EKKCNNRNR	ELLDAVNSSC	KLFMS HTALS	CKIVLRCAIG	APHTEEK	EANKIIQEEA	SYLLHK	
GLFVSGVHD	HENNINEDDH	LLVVANKLNQ	IYLEKVNATC	SLYMTHAVVG	GIYMIRFAVG	STHREERHIT	HAMKVLQEHA	DTILGTFNLA	DFSC
GGGGD	DEEG	LDAVNELNR	KILLESINASC	RIYMTUSVVG	GVYMIRFAVG	ASLIEDRIVN	LANKVVQDHA	DALLLGPSCN	GVHAS
MDKL	KTKYVNCLLS	EEEQINEFNR	ELLESINASC	KAYMTHAVLG	CIYAIRFAIC	ATLIEKRIWV	VATTVVQQHL	EAFQSAFKP-	
MDKL	KTKYVNCLLS	EGEQINEFNR	ELLESINASC	KAYMTHAVLG	CIYAIRFATG	ATLIEKOHWV	VATTVVQQHL	EAFQSAFKP-	
MDKL	KTKYVNCLLS	EEEQINEFNR	ELLESINASC	KAVMTHAVLG	CIYAIRFATG	ATIMEKRIWV	VANTVVQQHL	EAFQSAFKP-	
MDKL	KTKYVNCLLS	EEEQINEFNR	ELLESINASC	KAMMTHAVLG	CIVAIRFAIG	ATIVIEKRIWV	VANTVVQQHL	EAFQSAFKP-	
MDKL	KTKYVNCLLS	EEEQINEFNR	ELLESINASC	KAMMTHAVLG	GIYAIRFATG	ATIMEKRINV	VATTVVQQHL	EAFQSAFKP-	
		-EDNGNKLNH	DILIDAVNSTG	DVFITUTVLS	GEVILRIAVG	APHOEVRHVH	AMOILQEKA	TALLESL	
		-EDNGNKLNH	DILIDAVNSTC	NVFITUTVLS	GEVILRFAVG	APLNEMRHVS	A A QILQEKA	TTCFFGLVAS	QYGDVKQNIE
RKK	IVEDDH	IEAQTNEVNA	KUTESVNASC	KIYMTHAVVG	GVYMIREAVG	ATIMEERNYT	GANKVVQEHT	DAILGALGED	VC
gvhqngngv	VPLR-DENEN	-LVLANKLNQ	VYNETVNATC	SVYMTHAVVG	GVYMIRFAVG	STHEERHVI	YMAKILQEHA	DLILGKFSEA	DFSS
gvhqngngv	IAVLENENEE	-LVLANKLNQ	VYERQVKATC	SVYMTHAVVG	GVYMIRFAVG	STIMEERINI	HATEVLQEHA	DLILSKFDEA	NFSS
NGK	LGENGVDYNC	IEEKTNEINS	KUTESVNASC	SIMMTHAVVG	CVYMIRFAVG	ATIMEERHVS	MARKVIQEHT	DAILGTVDDS	VVA
RKK	IVEDDH	IEAQTNEVNA	KINESVNASC	KINMTHAVVG	GVYMIRDAVG	ATIMEERINT	GANKVVQEHT	DAILGALDGK	TTTIHEILD-
GVHQNGNGV	VAVH-NENET	-LLLANKLNQ	VYDETVNATC	SVYMTHAVVG	GVYMIRFAVG	STLIEERHVI	HEWKVLQEHA	DLILGKFSEA	DFSS
RKK	IVEDDH	IEAQTNEVNA	KINESVNASC	KIYM	IRESVC	ATIMEERNYT	GA2KVVQEHT	DAILGALGDD	VC
KQK	IVDNDY	IEDQTNEVNA	KINESVNASC	KINMTHAVVG	GVYMIRFAVG	ATHEERHVT	GA2KVVQEHT	DAILGA	
KND		-EDEVNEINR	KINESVINDS-						
KND		-EDEVNEINR	KINESVINDS'C	RIMVSUTVLG	GINVIRFAIG	GTIMDIN:WS	A'A7KVLQDHA	GALLDDTFTS	NKLVEVLS
KND		-ENEVNEINR	KINESVADSC	RINVSUTVLG	CINVIREAIG	GTIMOINEVS	AAR VLQDHA	DALLDDAFLP	KKIVNILS
KND		EDEVNEINR	KITESVNDSC	RINVSTVLG	CINVIRDAIG	GTHIDINEVS	A WKVLQDHA	DALLDEAFTA	N
QVST	KEDD	-EKEVNMENT	KOVESINSCE	KLMLTI GVVG	CIMIERIAIC	ASWHYRIVD	VANKAIQDHA	NALLNQGYV-	
NGYONGNGV	YHKD	-ESRANELNR	RHESINASC	SAMMTHISMVG	CVMMII(194WC	ASIMEERAWI	DAWKVVQEHA	DAVLATE	
kiQN	EFCGKADHHV	HOKHANEFNR	K PESINASC	HMMMTHAQVE	CIMEROAVC	ATTWEDKINT	IVANE VVREMV	DIMLKLHPQ-	
	s	GSADTEMLAR	KINDWVNSTC	RVALTATIVG	CLYMIDRIDAVG	ASIMDERINV	ANTELIMEGA	DRLFKGSAF-	
	S	GSADTEMLAR	KINDWVNSTC	RVMLTHTIVG	CLYMINRDAVG	ASIMIDERINV	AMELIMEGA	DRLFKGSAF-	

	610	620	630	640	650	0
TDC1_Actaea_racemosa						
TDC2 Actaea racemosa						
partial TDC Actaea racemosa						
TDC1 Camptotheca acuminata						
TDC2 Camptotheca acuminata						
TDC1 Capsicum annuum						
TDC2 Capsicum annuum						
TDC Catharanthus roseus						
TDC Mitragyna speciosa						
TDC Ophiorrhiza prostrata						
TDC Ophicrrhiza pumila						
TDC Rauvolfia verticillata						
TDC Tabernaemontana elegans						
TDC Vinca minor						
TYDC1a Arabidopsis thaliana						
TYDC1b Arabidopsis thaliana						
TYDC1c Arabidopsis thaliana						
TYDC1d Arabidopsis thaliana						
TYDC Argemone mexicana						
TYDC Aristolochia contorta						
TYDC Citrus aurantium						
TYDCI Citrus reshni						
TYDC2 Citrus reshni						
TYDC Citrus reticulata						
TYDC Citrus sinensis						
TYDC1 Medicago truncatula						
TYDC2 Medicago truncatula	TSDGRQTVED	FLRNYFGFKH	DFLGMVALVN	VACPIAFALV	FAIAIKMFNF	QSR
TYDC1 Papaver somniferum						
TYDC2 Papaver somniferum						
TYDC3 Papaver somniferum						
TYDC5 Papaver somniferum						
TYDC6 Papaver somniferum						
TYDC7 Papaver somniferum						
TYDCS Papaver somniferum						
TYDC9 Papaver somniferum						
TYDC1 Petroselinum crispum						
TYDC2 Petroselinum crispum						
TYDC3 Petroselinum crispum						
TYDC4_Petroselinum_crispum						
TYDC_Solanum_tuberosum						
TYDC Thalictrum_flavum						
TYDC Theobroma cacao						
Ciclev10014992m						
orange1.1g010842m						

Figure S5. Multiple sequence alignment for representative plant TDC and TYDC enzymes with the two *Citrus* sequences retrieved in this work. Residues identical or similar in at least 80% of the aligned sequences are shaded in black or grey, respectively; gaps introduced are represented by dashes.