

	1	10	20	30	40	50	60	70	80	90																																																																																
LbFd-GOGAT	M	A	V	N	S	V	A	N	V	P	Q	L	L	Y	A	N	G	S	P	K	I	V	A	G	S	K	D	S	V	F	D	F	V	G	L	Y	S	K	S	T	K	R	N	R	R	S	I	G	Y	A	P	A	N	R	R	S	F	L	K	T	K	W	N	A	V	L	D	L	E	R	V	P	T	N	A	S	H	Q	S	S	D	I	V	P	K	V	A	D	L	D
LrFd-GOGAT	M	A	V	N	S	V	A	N	V	P	Q	L	L	Y	A	N	G	S	P	K	I	V	A	G	S	K	D	S	V	F	D	F	V	G	L	Y	S	K	S	T	K	R	N	R	R	S	I	G	Y	A	P	A	N	R	R	S	F	L	K	T	K	W	N	A	V	L	D	L	E	R	V	P	T	N	A	S	H	Q	S	S	D	I	V	P	K	V	A	D	L	D
LcFd-GOGAT	M	A	V	N	S	V	A	N	V	P	Q	L	L	Y	A	N	G	S	P	K	I	V	A	G	S	K	D	S	V	F	D	F	V	G	L	Y	S	K	S	T	K	R	N	R	R	S	I	G	Y	A	P	A	N	R	R	S	F	L	K	T	K	W	N	A	V	L	D	L	E	R	V	P	T	N	A	S	H	Q	S	S	D	I	V	P	K	V	A	D	L	D
WsFd-GOGAT	M	A	V	N	S	V	A	N	V	P	Q	L	L	Y	A	N	G	S	P	K	I	V	A	G	S	K	D	S	V	F	D	F	V	G	L	Y	S	K	S	T	K	R	N	R	R	S	I	G	Y	A	P	A	N	R	R	S	F	L	K	T	K	W	N	A	V	L	D	L	E	R	V	P	T	N	A	S	H	Q	S	S	D	I	V	P	K	V	A	D	L	D
LfFd-GOGAT	M	A	V	N	S	V	A	N	V	P	Q	L	L	Y	A	N	G	S	P	K	I	V	A	G	S	K	D	S	V	F	D	F	V	G	L	Y	S	K	S	T	K	R	N	R	R	S	I	G	Y	A	P	A	N	R	R	S	F	L	K	T	K	W	N	A	V	L	D	L	E	R	V	P	T	N	A	S	H	Q	S	S	D	I	V	P	K	V	A	D	L	D
SlFd-GOGAT	M	A	V	N	S	V	A	N	V	P	Q	L	L	Y	A	N	G	S	P	K	I	L	T	G	N	K	D	G	L	F	A	D	F	L	G	F	V	C	K	S	S	K	R	I	R	R	I	G	Y	A	T	N	R	R	S	L	I	N	K	C	N	A	V	L	D	L	E	R	V	P	T	N	A	S	H	Q	S	S	D	I	V	P	K	V	A	D	L	D		

Figure S1: Alignment of Fd-GOGAT sequences in *Lycium* species

	100	110	120	130	140	150	160	170	180																																																																																	
LbFd-GOGAT	I	L	S	E	R	G	A	C	G	V	G	F	I	A	N	L	D	N	K	A	S	H	G	I	V	K	D	A	V	A	L	G	C	M	E	H	R	G	G	C	A	D	N	S	G	D	G	S	G	L	M	T	S	I	P	W	D	L	F	N	D	W	A	E	K	E	G	I	A	V	F	D	K	L	H	T	G	V	G	M	I	F	L	P	K	D	C	N	Q	M
LrFd-GOGAT	I	L	S	E	R	G	A	C	G	V	G	F	I	A	N	L	D	N	K	A	S	H	G	I	V	K	D	A	V	A	L	G	C	M	E	H	R	G	G	C	A	D	N	S	G	D	G	S	G	L	M	T	S	I	P	W	D	L	F	N	D	W	A	E	K	E	G	I	A	V	F	D	K	L	H	T	G	V	G	M	I	F	L	P	K	D	C	N	Q	M
LcFd-GOGAT	I	L	S	E	R	G	A	C	G	V	G	F	I	A	N	L	D	N	K	A	S	H	G	I	V	K	D	A	V	A	L	G	C	M	E	H	R	G	G	C	A	D	N	S	G	D	G	S	G	L	M	T	S	I	P	W	D	L	F	N	D	W	A	E	K	E	G	I	A	V	F	D	K	L	H	T	G	V	G	M	I	F	L	P	K	D	C	N	Q	M
WsFd-GOGAT	I	L	S	E	R	G	A	C	G	V	G	F	I	A	N	L	D	N	K	A	S	H	G	I	V	K	D	A	V	A	L	G	C	M	E	H	R	G	G	C	A	D	N	S	G	D	G	S	G	L	M	T	S	I	P	W	D	L	F	N	D	W	A	E	K	E	G	I	A	V	F	D	K	L	H	T	G	V	G	M	I	F	L	P	K	D	C	N	Q	M
LfFd-GOGAT	I	L	S	E	R	G	A	C	G	V	G	F	I	A	N	L	D	N	K	A	S	H	G	I	V	K	D	A	V	A	L	G	C	M	E	H	R	G	G	C	A	D	N	S	G	D	G	S	G	L	M	T	S	I	P	W	D	L	F	N	D	W	A	E	K	E	G	I	A	V	F	D	K	L	H	T	G	V	G	M	I	F	L	P	K	D	C	N	Q	M
SlFd-GOGAT	I	L	S	E	R	G	A	C	G	V	G	F	I	A	N	L	D	N	K	A	S	H	G	I	V	K	D	A	V	A	L	G	C	M	E	H	R	G	G	C	A	D	N	S	G	D	G	S	G	L	M	T	S	I	P	W	D	L	F	N	D	W	A	E	K	E	G	I	A	V	F	D	K	L	H	T	G	V	G	M	I	F	L	P	K	D	C	N	Q	M

	190	200	210	220	230	240	250	260	270																																																																															
LbFd-GOGAT	N	E	A	K	K	V	I	S	I	F	N	N	E	G	L	E	V	L	A	W	R	S	V	P	D	S	S	V	G	Y	Y	A	K	A	T	M	P	N	I	Q	Q	V	F	R	V	V	K	E	E	N	V	D	I	E	R	E	L	Y	I	C	R	K	L	I	E	R	A	V	N	S	E	I	W	G	N	E	L	Y	F	C	S	L	S	N	Q	T	I	V
LrFd-GOGAT	N	E	A	K	K	V	I	S	I	F	N	N	E	G	L	E	V	L	A	W	R	S	V	P	D	S	S	V	G	Y	Y	A	K	A	T	M	P	N	I	Q	Q	V	F	R	V	V	K	E	E	N	V	D	I	E	R	E	L	Y	I	C	R	K	L	I	E	R	A	V	N	S	E	I	W	G	N	E	L	Y	F	C	S	L	S	N	Q	T	I	V
LcFd-GOGAT	N	E	A	K	K	V	I	S	I	F	N	N	E	G	L	E	V	L	A	W	R	S	V	P	D	S	S	V	G	Y	Y	A	K	A	T	M	P	N	I	Q	Q	V	F	R	V	V	K	E	E	N	V	D	I	E	R	E	L	Y	I	C	R	K	L	I	E	R	A	V	N	S	E	I	W	G	N	E	L	Y	F	C	S	L	S	N	Q	T	I	V
WsFd-GOGAT	N	E	A	K	K	V	I	S	I	F	N	N	E	G	L	E	V	L	A	W	R	S	V	P	D	S	S	V	G	Y	Y	A	K	A	T	M	P	N	I	Q	Q	V	F	R	V	V	K	E	E	N	V	D	I	E	R	E	L	Y	I	C	R	K	L	I	E	R	A	V	N	S	E	I	W	G	N	E	L	Y	F	C	S	L	S	N	Q	T	I	V
LfFd-GOGAT	N	E	A	K	K	V	I	S	I	F	N	N	E	G	L	E	V	L	A	W	R	S	V	P	D	S	S	V	G	Y	Y	A	K	A	T	M	P	N	I	Q	Q	V	F	R	V	V	K	E	E	N	V	D	I	E	R	E	L	Y	I	C	R	K	L	I	E	R	A	V	N	S	E	I	W	G	N	E	L	Y	F	C	S	L	S	N	Q	T	I	V
SlFd-GOGAT	N	E	A	K	K	V	I	S	I	F	N	N	E	G	L	E	V	L	G	W	R	S	V	P	D	S	S	V	G	Y	Y	A	K	A	T	M	P	N	I	Q	Q	V	F	R	V	V	K	E	E	N	V	D	I	E	R	E	L	Y	I	C	R	K	L	I	E	R	A	V	N	S	E	I	W	G	N	E	L	Y	F	C	S	L	S	N	Q	T	I	V

	280	290	300	310	320	330	340	350	360	370																																																																																		
LbFd-GOGAT	Y	K	G	M	L	R	S	E	V	L	G	R	F	Y	Y	D	L	Q	S	E	L	Y	T	S	P	L	A	I	Y	H	R	R	Y	S	T	N	T	S	P	R	W	P	L	A	Q	P	M	R	F	L	G	H	N	G	E	I	N	T	I	Q	G	N	L	N	W	M	S	R	E	A	S	L	K	S	T	V	W	R	G	R	E	D	E	I	R	P	F	G	N	P	K	A
LrFd-GOGAT	Y	K	G	M	L	R	S	E	V	L	G	R	F	Y	Y	D	L	Q	S	E	L	Y	T	S	P	L	A	I	Y	H	R	R	Y	S	T	N	T	S	P	R	W	P	L	A	Q	P	M	R	F	L	G	H	N	G	E	I	N	T	I	Q	G	N	L	N	W	M	S	R	E	A	S	L	K	S	T	V	W	R	G	R	E	D	E	I	R	P	F	G	N	P	K	A
LcFd-GOGAT	Y	K	G	M	L	R	S	E	V	L	G	R	F	Y	Y	D	L	Q	S	E	L	Y	T	S	P	L	A	I	Y	H	R	R	Y	S	T	N	T	S	P	R	W	P	L	A	Q	P	M	R	F	L	G	H	N	G	E	I	N	T	I	Q	G	N	L	N	W	M	S	R	E	A	S	L	K	S	T	V	W	R	G	R	E	D	E	I	R	P	F	G	N	P	K	A
WsFd-GOGAT	Y	K	G	M	L	R	S	E	V	L	G	R	F	Y	Y	D	L	Q	S	E	L	Y	T	S	P	L	A	I	Y	H	R	R	Y	S	T	N	T	S	P	R	W	P	L	A	Q	P	M	R	F	L	G	H	N	G	E	I	N	T	I	Q	G	N	L	N	W	M	S	R	E	A	S	L	K	S	T	V	W	R	G	R	E	D	E	I	R	P	F	G	N	P	K	A
LfFd-GOGAT	Y	K	G	M	L	R	S	E	V	L	G	R	F	Y	Y	D	L	Q	S	E	L	Y	T	S	P	L	A	I	Y	H	R	R	Y	S	T	N	T	S	P	R	W	P	L	A	Q	P	M	R	F	L	G	H	N	G	E	I	N	T	I	Q	G	N	L	N	W	M	S	R	E	A	S	L	K	S	T	V	W	R	G	R	E	D	E	I	R	P	F	G	N	P	K	A
SlFd-GOGAT	Y	K	G	M	L	R	S	E	V	L	G	R	F	Y	Y	D	L	Q	S	E	L	Y	T	S	P	L	A	I	Y	H	R	R	Y	S	T	N	T	S	P	R	W	P	L	A	Q	P	M	R	F	L	G	H	N	G	E	I	N	T	I	Q	G	N	L	N	W	M	S	R	E	A	S	L	K	S	T	V	W	R	G	R	E	D	E	I	R	P	F	G	N	P	K	A

	380	390	400	410	420	430	440	450	460																																			
LbFd-GOGAT	S	D	S	A	N	L	D	S	A	E	L	L	I	R	S	G	R	A	P	E	E	A	L	M	I	L	V	P	E	Y	Q	N	H	P	T	L	I	K	Y	P	E	V	L	D

	750	760	770	780	790	800	810	820	830
LbFd-GOGAT	IVADTAQCFSTHQFACLI	GYGASAVCPYLAFETCRQ	WRLSTKTVNLMRNGKMP	SVTIEQAQKNFCKAV	KSGLLKILSKMGISLL	SSYCGAQIF			
LrFd-GOGAT	IVADTAQCFSTHQFACLI	GYGASAVCPYLAFETCRQ	WRLSTKTVNLMRNGKMP	SVTIEQAQKNFCKAV	KSGLLKILSKMGISLL	SSYCGAQIF			
LcFd-GOGAT	IVADTAQCFSTHQFACLI	GYGASAVCPYLAFETCRQ	WRLSTKTVNLMRNGKMP	SVTIEQAQKNFCKAV	KSGLLKILSKMGISLL	SSYCGAQIF			
WsFd-GOGAT	IVADTAQCFSTHQFACLI	GYGASAVCPYLAFETCRQ	WRLSTKTVNLMRNGKMP	SVTIEQAQKNFCKAV	KSGLLKILSKMGISLL	SSYCGAQIF			
LfFd-GOCAT	IVADTAQCFSTHQFACLI	GYGASAVCPYLAFETCRQ	WRLSTKTVNLMRNGKMP	SVTIEQAQKNFCKAV	KSGLLKILSKMGISLL	SSYCGAQIF			
SlFd-GOGAT	IVADTAQCFSTHQFACLI	GYGASAVCPYLAFETCRQ	WRLSTKTVNLMRNGKMP	SVTIEQAQKNFCKAV	KSGLLKILSKMGISLL	SSYCGAQIF			

	840	850	860	870	880	890	900	910	920	930
LbFd-GOGAT	EIYGLGKEVVNVAF	CGSRSSIGGLTLDELARE	TLFVFWKAFSEDTA	KRL	ENYGF	QFRQGGEYHGNNPE	MSKLLHKA	VRQKSESAY	SVYQOHL	
LrFd-GOGAT	EIYGLGKEVVNVAF	CGSRSSIGGLTLDELARE	TLFVFWKAFSEDTA	KRL	ENYGF	QFRQGGEYHGNNPE	MSKLLHKA	VRQKSESAY	SVYQOHL	
LcFd-GOGAT	EIYGLGKEVVNVAF	CGSRSSIGGLTLDELARE	TLFVFWKAFSEDTA	KRL	ENYGF	QFRQGGEYHGNNPE	MSKLLHKA	VRQKSESAY	SVYQOHL	
WsFd-GOGAT	EIYGLGKEVVNVAF	CGSRSSIGGLTLDELARE	TLFVFWKAFSEDTA	KRL	ENYGF	QFRQGGEYHGNNPE	MSKLLHKA	VRQKSESAY	SVYQOHL	
LfFd-GOCAT	EIYGLGKEVVNVAF	CGSRSSIGGLTLDELARE	TLFVFWKAFSEDTA	KRL	ENYGF	QFRQGGEYHGNNPE	MSKLLHKA	VRQKSESAY	SVYQOHL	
SlFd-GOGAT	EIYGLGKEVMDIA	FCGSRSSIGGLTLDELARE	TLFVFWKAFSEDTA	KRL	ENYGF	QFRQGGEYHGNNPE	MSKLLHKA	VRQKSESAY	SVYQOHL	

	940	950	960	970	980	990	1000	1010	1020
LbFd-GOGAT	ANRPVNVLRDLLEFKSD	GSPIPVGRVEPASAI	VQRFCTGGMSLGAISRE	THEAIAIAMNRLGGK	SNSEGGGEDPIR	WKPLTDV	VDGYSPTLPH		
LrFd-GOGAT	ANRPVNVLRDLLEFKSD	GSPIPVGRVEPASAI	VQRFCTGGMSLGAISRE	THEAIAIAMNRLGGK	SNSEGGGEDPIR	WKPLTDV	VDGYSPTLPH		
LcFd-GOGAT	ANRPVNVLRDLLEFKSD	GSPIPVGRVEPASAI	VQRFCTGGMSLGAISRE	THEAIAIAMNRLGGK	SNSEGGGEDPIR	WKPLTDV	VDGYSPTLPH		
WsFd-GOGAT	ANRPVNVLRDLLEFKSD	GSPIPVGRVEPASAI	VQRFCTGGMSLGAISRE	THEAIAIAMNRLGGK	SNSEGGGEDPIR	WKPLTDV	VDGYSPTLPH		
LfFd-GOCAT	ANRPVNVLRDLLEFKSD	GSPIPVGRVEPASAI	VQRFCTGGMSLGAISRE	THEAIAIAMNRLGGK	SNSEGGGEDPIR	WKPLTDV	VDGYSPTLPH		
SlFd-GOGAT	ANRPVNVLRDLLEFKSD	RSPIPVGRVEPASAI	VQRFCTGGMSLGAISRE	THEAIAIAMNRLGGK	SNSEGGGEDPIR	WKPLTDV	VDGYSPTLPH		

	1030	1040	1050	1060	1070	1080	1090	1100	1110
LbFd-GOGAT	LKGLQNGDTATSAIKQ	VASGRFGVTPTFLANA	GQLEIKVAQGA	KPGEGGQ	LP	GKKVSAYIAR	LNSKPGVPLIS	PPPHHDIYSIEDLA	QLIYD
LrFd-GOGAT	LKGLQNGDTATSAIKQ	VASGRFGVTPTFLANA	GQLEIKVAQGA	KPGEGGQ	LP	GKKVSAYIAR	LNSKPGVPLIS	PPPHHDIYSIEDLA	QLIYD
LcFd-GOGAT	LKGLQNGDTATSAIKQ	VASGRFGVTPTFLANA	GQLEIKVAQGA	KPGEGGQ	LP	GKKVSAYIAR	LNSKPGVPLIS	PPPHHDIYSIEDLA	QLIYD
WsFd-GOGAT	LKGLQNGDTATSAIKQ	VASGRFGVTPTFLANA	GQLEIKVAQGA	KPGEGGQ	LP	GKKVSAYIAR	LNSKPGVPLIS	PPPHHDIYSIEDLA	QLIYD
LfFd-GOCAT	LKGLQNGDTATSAIKQ	VASGRFGVTPTFLANA	GQLEIKVAQGA	KPGEGGQ	LP	GKKVSAYIAR	LNSKPGVPLIS	PPPHHDIYSIEDLA	QLIYD
SlFd-GOGAT	LKGLQNGDTATSAIKQ	VASGRFGVTPTFLANA	DQLEIKVAQGA	KPGEGGQ	LP	GKKVSAYIAR	LNSKPGVPLIS	PPPHHDIYSIEDLA	QLIYD

	1120	1130	1140	1150	1160	1170	1180	1190	1200
LbFd-GOGAT	LHQVNP	AKVSVKLVAEAGIGTV	ASGVAKGNADIIQIS	GHDGGTGASPV	SSIKHAGGPWELGLT	ETHOTLIENGLR	ERVVLRVDGGFKSG	FDDV	
LrFd-GOGAT	LHQVNP	AKVSVKLVAEAGIGTV	ASGVAKGNADIIQIS	GHDGGTGASPV	SSIKHAGGPWELGLT	ETHOTLIENGLR	ERVVLRVDGGFKSG	FDDV	
LcFd-GOGAT	LHQVNP	AKVSVKLVAEAGIGTV	ASGVAKGNADIIQIS	GHDGGTGASPV	SSIKHAGGPWELGLT	ETHOTLIENGLR	ERVVLRVDGGFKSG	FDDV	
WsFd-GOGAT	LHQVNP	AKVSVKLVAEAGIGTV	ASGVAKGNADIIQIS	GHDGGTGASPV	SSIKHAGGPWELGLT	ETHOTLIENGLR	ERVVLRVDGGFKSG	FDDV	
LfFd-GOCAT	LHQVNP	AKVSVKLVAEAGIGTV	ASGVAKGNADIIQIS	GHDGGTGASPV	SSIKHAGGPWELGLT	ETHOTLIENGLR	ERVVLRVDGGFKSG	FDDV	
SlFd-GOGAT	LHQVNP	RAKVSVKLVAEAGIGTV	ASGVAKGNADIIQIS	GHDGGTGASPV	SSIKHAGGPWELGLT	ETHOTLIENGLR	ERVVLRVDGGFKSG	FDDV	

	1210	1220	1230	1240	1250	1260	1270	1280	1290	1300
LbFd-GOGAT	MMAAAMGADEYGF	GSVAMIATGCVMARIC	TNNCPVGVASQREEL	RARFP	GPV	GD	LVN	YFLYVAEEV	RGMLAQLGYEK	LDDIIGRTDILRSRD
LrFd-GOGAT	MMAAAMGADEYGF	GSVAMIATGCVMARIC	TNNCPVGVASQREEL	RARFP	GPV	GD	LVN	YFLYVAEEV	RGMLAQLGYEK	LDDIIGRTDILRSRD
LcFd-GOGAT	MMAAAMGADEYGF	GSVAMIATGCVMARIC	TNNCPVGVASQREEL	RARFP	GPV	GD	LVN	YFLYVAEEV	RGMLAQLGYEK	LDDIIGRTDILRSRD
WsFd-GOGAT	MMAAAMGADEYGF	GSVAMIATGCVMARIC	TNNCPVGVASQREEL	RARFP	GPV	GD	LVN	YFLYVAEEV	RGMLAQLGYEK	LDDIIGRTDILRSRD
LfFd-GOCAT	MMAAAMGADEYGF	GSVAMIATGCVMARIC	TNNCPVGVASQREEL	RARFP	GPV	GD	LVN	YFLYVAEEV	RGMLAQLGYEK	LDDIIGRTDILRSRD
SlFd-GOGAT	MMAAAMGADEYGF	GSVAMIATGCVMARIC	TNNCPVGVASQREEL	RARFP	GPV	GD	LVN	YFLYVAEEV	RGMLAQLGYEK	LDDIIGRTDILRP

	1310	1320	1330	1340	1350	1360	1370	1380	1390
LbFd-GOGAT	ISLMKTRHLDLSYIL	SNVGLPEWSS	TMIRNQEVHSNGP	VLDDVLLADPKIS	DAIEN	EKVVNKTVEIYNIDRA	VCGR	IAGAVAKKYGDTGF	FAGO
LrFd-GOGAT	ISLMKTRHLDLSYIL	SNVGLPEWSS	TMIRNQEVHSNGP	VLDDVLLADPKIS	DAIEN	EKVVNKTVEIYNIDRA	VCGR	IAGAVAKKYGDTGF	FAGO
LcFd-GOGAT	ISLMKTRHLDLSYIL	SNVGLPEWSS	TMIRNQEVHSNGP	VLDDVLLADPKIS	DAIEN	EKVVNKTVEIYNIDRA	VCGR	IAGAVAKKYGDTGF	FAGO
WsFd-GOGAT	ISLMKTRHLDLSYIL	SNVGLPEWSS	TMIRNQEVHSNGP	VLDDVLLADPKIS	DAIEN	EKVVNKTVEIYNIDRA	VCGR	IAGAVAKKYGDTGF	FAGO
LfFd-GOCAT	ISLMKTRHLDLSYIL	SNVGLPEWSS	TMIRNQEVHSNGP	VLDDVLLADPKIS	DAIEN	EKVVNKTVEIYNIDRA	VCGR	IAGAVAKKYGDTGF	FAGO
SlFd-GOGAT	ISLMKTRHLDLSYIL	SNVGLPEWSS	SMIRNQEVHSNGP	VLDDVLLADPKIS	DAIEN	EKVVNKTVEIYNIDRA	VCGR	IAGAVAKKYGDTGF	FAGO

	1400	1410	1420	1430	1440	1450	1460	1470	1480	
LbFd-GOGAT	LNITFTGSAGQS	FACFLT	PGMNIRLIGE	ANDYVGKGMAGGEL	VVTPVENTGF	CPEDAT	IVGNTCLYGAT	GGQV	FVRGKAGERFAVRNSLA	EAV
LrFd-GOGAT	LNITFTGSAGQS	FACFLT	PGMNIRLIGE	ANDYVGKGMAGGEL	VVTPVENTGF	CPEDAT	IVGNTCLYGAT	GGQV	FVRGKAGERFAVRNSLA	EAV
LcFd-GOGAT	LNITFTGSAGQS	FACFLT	PGMNIRLIGE	ANDYVGKGMAGGEL	VVTPVENTGF	CPEDAT	IVGNTCLYGAT	GGQV	FVRGKAGERFAVRNSLA	EAV
WsFd-GOGAT	LNITFTGSAGQS	FACFLT	PGMNIRLIGE	ANDYVGKGMAGGEL	VVTPVENTGF	CPEDAT	IVGNTCLYGAT	GGQV	FVRGKAGERFAVRNSLA	EAV
LfFd-GOCAT	LNITFTGSAGQS	FACFLT	PGMNIRLIGE	ANDYVGKGMAGGEL	VVTPVENTGF	CPEDAT	IVGNTCLYGAT	GGQV	FVRGKAGERFAVRNSLA	EAV
SlFd-GOGAT	LNITFTGSAGQS	FACFLT	PGMNIRLIGE	ANDYVGKGMAGGEL	VVTPVENTGF	VPEDAT	IVGNTCLYGAT	GGQV	FVRGKAGERFAVRNSLA	QAV

	1490	1500	1510	1520	1530	1540	1550	1560	1570	1580		
LbFd-GOGAT	VEGTGDHCCEYMTGGCVVVLGKVGRNVAAGMTGGGLAYILDEDET					L	VPKVNKEIVKIQRVVAPVGM	QLKNLI	KAHVEKTGSTKG	S	VILKDWDK	
LrFd-GOGAT	VEGTGDHCCEYMTGGCVVVLGKVGRNVAAGMTGGGLAYILDEDET					L	VPKVNKEIVKIQRVVAPVGM	QLKNLI	KAHVEKTGSTKG	C	VILKDWDK	
LcFd-GOGAT	VEGTGDHCCEYMTGGCVVVLGKVGRNVAAGMTGGGLAYILDEDET					L	VPKVNKEIVKIQRVVAPVGM	QLKNLI	KAHVEKTGSTKG	S	VILKDWDK	
WsFd-GOGAT	VEGTGDHCCEYMTGGCVVVLGKVGRNVAAGMTGGGLAYILDEDET					L	VPKVNKEIVKIQRVVAPVGM	QLKNLI	KAHVEKTGSTKG	S	VILKDWDK	
LfFd-GOGAT	VEGTGDHCCEYMTGGCVVVLGKVGRNVAAGMTGGGLAYILDEDET					L	VPKVNKEIVKIQRVVAPVGM	QLKNLI	KAHVEKTGSTKG	S	VILKDWDK	
SlFd-GOGAT	VEGTGDHCCEYMTGGCVVVLGKVGRNVAAGMTGGGLAYILDEDET					F	VPKVNKEIVKIQRVVAPVGT	QLKNLI	E	AHVEKTGSTKG	S	VILKDWDK

	1590	1600	1610	1620
LbFd-GOGAT	YLPLFWQLVPPSEEDTPEACAEYEQAAAAGQVVTLSAEIPLK			
LrFd-GOGAT	YLPLFWQLVPPSEEDTPEACAEYEQAAAAGQVVTLSAEIPLK			
LcFd-GOGAT	YLPLFWQLVPPSEEDTPEACAEYEQAAAAGQVVTLSAEIPLK			
WsFd-GOGAT	YLPLFWQLVPPSEEDTPEACAEYEQAAAAGQVVTLSAEIPLK			
LfFd-GOGAT	YLPLFWQLVPPSEEDTPEACAEYEQAAAAGQVVTLSAEIPLK			
SlFd-GOGAT	YLPLFWQLVPPSEEDTPEASAEYEQLASGQEVVTLSAEMPLK			

Figure S1: Alignment of Fd-GOGAT sequences in *Lycium* species