

Supplementary Table S 1. List of species, *Agave tequilana*, asparagus (*Asparagus officinalis*), goatgrass (*Aegilops tauschii*), wheat (*Triticum aestivum*), barley (*Hordeum vulgare*), *Arabidopsis thaliana*, carrot (*Daucus carota*), beetroot (*Beta vulgaris*), maize (*Zea mays*) and rice (*Oryza sativa*), and accession numbers for PGHF32 sequences used in alignments and phylogenetic analyses.

Class	Species	Accession	Code
Monocotyledon	<i>A. tauschii</i>	XM_020304935.1	Ata1SST-like
Monocotyledon	<i>A. tauschii</i>	XM_020334947.1	Ata1FFT-like
Monocotyledon	<i>A. tauschii</i>	XM_020301133.1	Ata6SFT-like
Monocotyledon	<i>A. tauschii</i>	XM_020321719.1	AtaInvlike1-like
Monocotyledon	<i>A. tauschii</i>	XM_020307765.1	Ata1FEH-like
Monocotyledon	<i>A. tauschii</i>	XM_020326258.1	AtaVinv1-like
Monocotyledon	<i>A. tauschii</i>	XM_020327311.1	AtaCwinv1-like
Monocotyledon	<i>H. vulgare</i>	AK354338	Hv1FFT
Monocotyledon	<i>H. vulgare</i>	AK356300	Hv6FEH
Monocotyledon	<i>H. vulgare</i>	JQ411255	HvInv1
Monocotyledon	<i>H. vulgare</i>	AK357105.1	HvCwinv1-like
Monocotyledon	<i>H. vulgare</i>	AJ605333	Hv1FEH
Monocotyledon	<i>H. vulgare</i>	JQ411256	HvInv2
Monocotyledon	<i>H. vulgare</i>	JQ411252.1	Hv1SST
Monocotyledon	<i>H. vulgare</i>	X83233	Hv6SFT
Monocotyledon	<i>O. sativa</i>	XM_015781448.2	OsInv2
Monocotyledon	<i>O. sativa</i>	XM_015770302.2	OsInv3

Monocotyledon	<i>O. sativa</i>	XM_015766627.2	OsInv4
Monocotyledon	<i>O. sativa</i>	XM_015778048.2	OsCwinv2
Monocotyledon	<i>O. sativa</i>	XM_015766627.1	OsCwinv4
Monocotyledon	<i>O. sativa</i>	XM_015778898.2	OsCwinv6
Monocotyledon	<i>O. sativa</i>	XM_015769787.2	OsCwinv1
Monocotyledon	<i>O. sativa</i>	XM_015757090.2	OsInv1
Monocotyledon	<i>Z. mays</i>	NM_001111899.2	ZmCwinv1
Monocotyledon	<i>Z. mays</i>	NM_001112126.2	ZmCwinv2
Monocotyledon	<i>Z. mays</i>	NM_001371613.1	ZmCwinv3
Monocotyledon	<i>Z. mays</i>	XM_020547998.1	ZmCwinv4
Monocotyledon	<i>Z. mays</i>	XM_008670214.3	ZmInv1
Monocotyledon	<i>Z. mays</i>	XM_020545958.1	ZmInv2
Monocotyledon	<i>Z. mays</i>	NM_001372181.1	Zm6,1FEH
Monocotyledon	<i>T. aestivum</i>	AJ508387	Ta1FEHw2
Monocotyledon	<i>T. aestivum</i>	AB088409	Ta1FFTA
Monocotyledon	<i>T. aestivum</i>	AB088410	Ta1FFTB
Monocotyledon	<i>T. aestivum</i>	AB029888	Ta1SST
Monocotyledon	<i>T. aestivum</i>	AM075205	Ta6FEH
Monocotyledon	<i>T. aestivum</i>	AB029887	Ta6SFT
Monocotyledon	<i>T. aestivum</i>	AB089269	Ta6,1FEH
Monocotyledon	<i>T. aestivum</i>	AJ516025	Ta1FEHw1

Monocotyledon	<i>T. aestivum</i>	AB089271	Ta6KEHw1
Monocotyledon	<i>T. aestivum</i>	AB089270	Ta6KEHw2
Monocotyledon	<i>T. aestivum</i>	AJ564996	Ta1FEHw3
Monocotyledon	<i>T. aestivum</i>	AJ635225	TaInv1-like
Monocotyledon	<i>T. aestivum</i>	AB196522	TaCwinv1-like
Monocotyledon	<i>T. aestivum</i>	TraesCS2A02G295400.1 (Ensembl plants)	TaCwinv2-like
Monocotyledon	<i>T. aestivum</i>	TraesCS2B02G311900.1 (Ensembl plants)	TaCwinv3-like
Monocotyledon	<i>T. aestivum</i>	TraesCS7D02G010000.2 (Ensembl plants)	TaVinv2-like
Monocotyledon	<i>T. aestivum</i>	TraesCS4A02G484800.1 (Ensembl plants)	TaVinv3-like
Monocotyledon	<i>A. officinalis</i>	AB115555 XM_020385299.1	Ao1SST
Monocotyledon	<i>A. officinalis</i>	AB115554.1 XM_020421252.1	Ao1FFT1
Monocotyledon	<i>A. officinalis</i>	AB084283 XM_020390805.1	Ao6GFFT
Monocotyledon	<i>A. officinalis</i>	AB195641 XM_020397679.1	Ao6FEH
Monocotyledon	<i>A. officinalis</i>	AB244731 XM_020397667.1	AoCwinv1-like
Monocotyledon	<i>A. officinalis</i>	XM_020390005.1	AoCwinv2-like
Monocotyledon	<i>A. tequilana</i>	EU026119 ON553358	Atq1FFT Gene Atq1FFT
Monocotyledon	<i>A. tequilana</i>	JN790053 ON553353	Atq1SST-1 Promoter Atq1SST-1
Monocotyledon	<i>A. tequilana</i>	JN790054 ON553354	Atq1SST-2 Promoter Atq1SST-2
Monocotyledon	<i>A. tequilana</i>	MK251792 ON553355	Atq1SST-3 Gene Atq1SST-3
Monocotyledon	<i>A. tequilana</i>	JN790055 ON553356	Atq6GFFT-1 Promoter Atq6GFFT-1
Monocotyledon	<i>A. tequilana</i>	JN790056 ON553357	Atq6GFFT-2 Promoter Atq6GFFT-2

Monocotyledon	<i>A. tequilana</i>	JN790058 ON553359	AtqVinv1 Promoter AtqVinv1
Monocotyledon	<i>A. tequilana</i>	GAHU01007017 ON553360	AtqVinv2 Gene AtqVinv2
Monocotyledon	<i>A. tequilana</i>	ON553350 ON553369	AtqVinv3-like Gene AtqVinv3-like
Monocotyledon	<i>A. tequilana</i>	ON553351 ON553370	AtqVinv4-like Gene AtqVinv4-like
Monocotyledon	<i>A. tequilana</i>	ON553352 ON553371	AtqVinv5-like Gene AtqVinv5-like
Monocotyledon	<i>A. tequilana</i>	GAHU01060462 ON553361	AtqInv1 Gene AtqInv1
Monocotyledon	<i>A. tequilana</i>	KR138450 ON553362	AtqInv2 Gene AtqInv2
Monocotyledon	<i>A. tequilana</i>	JN790057 ON553363	AtqCwinv-1 Gene AtqCwnv-1
Monocotyledon	<i>A. tequilana</i>	GAHU01053508 ON553364	AtqCwinv-2 Gene AtqCwinv-2
Monocotyledon	<i>A. tequilana</i>	KR138454 ON553365	AtqFEH-1 Gene AtqFEH-1
Monocotyledon	<i>A. tequilana</i>	GAHU01085730 ON553366	AtqFEH-2 Gene AtqFEH-2
Monocotyledon	<i>A. tequilana</i>	KR138455 ON553367	AtqFEH-3 Gene AtqFEH-3
Monocotyledon	<i>A. tequilana</i>	GAHU01012712 ON553368	AtqFEH-4 Gene AtqFEH-4
Dicotyledon	<i>A. thaliana</i>	(TAIR: AT1G62660) NM_104943	AthVinv1
Dicotyledon	<i>A. thaliana</i>	(TAIR: AT1G12240) NM_101096	AthVinv2
Dicotyledon	<i>A. thaliana</i>	(TAIR:AT3G13790) NM_112232	AthCwinv1
Dicotyledon	<i>A. thaliana</i>	(TAIR:AT3G52600) NM_115120	AthCwinv2
Dicotyledon	<i>A. thaliana</i>	(TAIR:AT2G36190) NM_129177	AthCwinv4
Dicotyledon	<i>A. thaliana</i>	(TAIR:AT3G13784) NM_112231	AthCwinv5
Dicotyledon	<i>A. thaliana</i>	(TAIR:AT1G55120) NM_104385	AthCwinv3 (6-FEH)
Dicotyledon	<i>A. thaliana</i>	(TAIR:AT5G11920) NM_121230.3	AthCwinv6 (6,1-FEH)

Dicotyledon	<i>B. vulgaris</i>	XM_010687077.2	Bv6FEH
Dicotyledon	<i>B. vulgaris</i>	XM_010677873.2	BvVinv
Dicotyledon	<i>B. vulgaris</i>	XM_010671083.2	BvCwinv
Dicotyledon	<i>D. carota</i>	XM_017396738.1	DcVinv1-like
Dicotyledon	<i>D. carota</i>	XM_017391458.1	DcVinv2-like
Dicotyledon	<i>D. carota</i>	XM_017389711.1	DcVinv3-like
Dicotyledon	<i>D. carota</i>	XM_017401429.1	DcCwinv2-like
Dicotyledon	<i>D. carota</i>	XM_017373748.1	DcCwinv1-like
Dicotyledon	<i>D. carota</i>	XM_017362189.1	DcCwinv3-like