

Supplemental Table S1. Accession data for the OSCs used in the phylogenetic analyses.

Accession No.	Gene name	Function[Species]
At4g15340	PEN1	Arabidiol synthase [ <i>Arabidopsis thaliana</i> ]
At4g15370	PEN2	Baruol synthase [ <i>A. thaliana</i> ]
At5g36150	PEN3	Tirucalla-7,24-dien-3-ol synthase [ <i>A. thaliana</i> ]
At5g48010	PEN4	Thalianol synthase [ <i>A. thaliana</i> ]
At5g42600	PEN5	Marneral synthase [ <i>A. thaliana</i> ]
At1g78500	PEN6	Bauerenol synthase [ <i>A. thaliana</i> ]
At1g78970	LUP1	Multifunctional triterpene synthase [ <i>A. thaliana</i> ]
At1g78960	LUP2	Multifunctional triterpene synthase [ <i>A. thaliana</i> ]
At1g78955	LUP3	Multifunctional triterpene synthase [ <i>A. thaliana</i> ]
At1g78950	LUP4	$\beta$ -amyrin synthase [ <i>A. thaliana</i> ]
At1g66960	LUP5	Multifunctional triterpene synthase [ <i>A. thaliana</i> ]
At3g45130	LSS1	Lanosterol synthase [ <i>A. thaliana</i> ]
At2g07050	CAS1	Cycloartenol synthase [ <i>A. thaliana</i> ]
AB263204	RsM2	Multifunctional triterpene synthase [ <i>Rhizophora stylosa</i> ]
AB257507	KcMS	Multifunctional triterpene synthase [ <i>Kandelia candel</i> ]
AB289586	BgLUS	Lupeol synthase [ <i>Bruguiera gymnorhiza</i> ]
FJ032006	MdOSC1	Multifunctional triterpene synthase [ <i>Malus <math>\times</math> domestica</i> ]
FJ032008	MdOSC3	Multifunctional triterpene synthase [ <i>Malus <math>\times</math> domestica</i> ]
KT383435	MdOSC4	Multifunctional triterpene synthase [ <i>Malus <math>\times</math> domestica</i> ]
KT383436	MdOSC5	Multifunctional triterpene synthase [ <i>Malus <math>\times</math> domestica</i> ]
AB058643	LcIMS1	Isomultiflorenol synthase [ <i>Luffa cylindrica</i> ]
FJ013228	NsbAS	$\beta$ -amyrin synthase [ <i>Nigella sativa</i> ]
HM623869	KdGLS	Multifunctional triterpene synthase [ <i>Kanlanchoe daigremontiana</i> ]
HM623870	KdFRS	Multifunctional triterpene synthase [ <i>K. daigremontiana</i> ]
HM623871	KdLUS	Multifunctional triterpene synthase [ <i>K. daigremontiana</i> ]
AB609123	SHS1	Shionone synthase [ <i>Aster tataricus</i> ]
AY836006	AsOXA1	$\beta$ -amyrin synthase [ <i>Aster sedifolius</i> ]
FJ790411	GsAS1	$\beta$ -amyrin synthase [ <i>Gentiana straminea</i> ]
KJ467352	GsAS2	$\beta$ -amyrin synthase [ <i>G. straminea</i> ]
AB037203	GgbAS	$\beta$ -amyrin synthase [ <i>Glycyrrhiza glabra</i> ]
AB181244	LjAMY1	$\beta$ -amyrin synthase [ <i>Lotus japonicus</i> ]
AF478455	LjAMY2	Multifunctional triterpene synthase [ <i>L. japonicus</i> ]
AJ430607	MtAMY1	$\beta$ -amyrin synthase [ <i>Medicago truncatula</i> ]
AB03802	PSY	$\beta$ -amyrin synthase [ <i>Pisum sativum</i> ]

EF107623	PtBS	$\beta$ -amyrin synthase [ <i>Polygala tenuifolia</i> ]
AB034803	PSM	Multifunctional triterpene synthase [ <i>Pisum sativum</i> ]
DQ915167	SvBS	$\beta$ -amyrin synthase [ <i>Saponaria vaccaria</i> ]
AB206469	EtAS	$\beta$ -amyrin synthase [ <i>Euphorbia tirucalli</i> ]
AB289585	BgbAS	$\beta$ -amyrin synthase [ <i>B. gymnorhiza</i> ]
AB263203	RsM1	Multifunctional triterpene synthase [ <i>R. stylosa</i> ]
AB055512	BPY	$\beta$ -amyrin synthase [ <i>Betula platyphylla</i> ]
HM623868	KdTAS	Multifunctional triterpene synthase [ <i>K. daigremontiana</i> ]
AB009030	PNY1	$\beta$ -amyrin synthase [ <i>Panax ginseng</i> ]
HM219225	AeAS	$\beta$ -amyrin synthase [ <i>Aralia elata</i> ]
HQ266579	SITTS1	$\beta$ -amyrin synthase [ <i>Solanum lycopersicum</i> ]
HQ266580	SITTS2	Multifunctional triterpene synthase [ <i>S. lycopersicum</i> ]
AB265170	PNA	Dammarenediol-II synthase [ <i>P. ginseng</i> ]
JN991165	CrAS	Multifunctional triterpene synthase [ <i>Catharanthus roseus</i> ]
AB009029	PNX	Cycloartenol synthase [ <i>P. ginseng</i> ]
AB055510	BPX	Cycloartenol synthase [ <i>B. platyphylla</i> ]
AB025968	GgCAS1	Cycloartenol synthase [ <i>G. glabra</i> ]
D89619	PSX	Cycloartenol synthase [ <i>P. sativum</i> ]
HM623872	KdCAS	Cycloartenol synthase [ <i>K. daigremontiana</i> ]
AK121211	AK121211	Cycloartenol synthase [ <i>O. sativa</i> ]
AK070534	AK070534	Unnamed protein [ <i>O. sativa</i> ]
AB116238	CPQ	Cucurbitadienol synthase [ <i>Cucurbita pepo</i> ]
HQ128567	SgCbQ	Cucurbitadienol synthase [ <i>Siraitia grosvenorii</i> ]
AB009031	PNZ	Lanosterol synthase [ <i>P. ginseng</i> ]
AK066327	AK066327	Pakeol synthase [ <i>O. sativa</i> ]
AB025343	QEW	Lupeol synthase [ <i>Olea europaea</i> ]
AB025345	TRW	Lupeol synthase [ <i>T. officinale</i> ]
AB055511	BPW	Lupeol synthase [ <i>B. platyphylla</i> ]
KX147270	MiFRS	Friedelin synthase [ <i>Maytenus ilicifolia</i> ]
KX147271	MiCAS1	Cycloartenol synthase [ <i>M. ilicifolia</i> ]
KM111167	IaAS1	Multifunctional triterpene synthase [ <i>Ilex asprella</i> var. <i>asprella</i> ]
KM111168	IaAS2	Multifunctional triterpene synthase [ <i>I. asprella</i> var. <i>asprella</i> ]
JQ728553	WsOSCBS	$\beta$ -amyrin synthase [ <i>Withania somnifera</i> ]
JQ728552	WsOSCLS	Lupeol synthase [ <i>W. somnifera</i> ]
HM037907	WsOSCCS	Cycloartenol synthase [ <i>W. somnifera</i> ]

Supplemental Table S2. Oligonucleotide primers used in this study

	Primers	Sequence (5' to 3')
Cloning	PtCAS1-F	TCATGTGGAGGCTGAAGATCGCAAAC
	PtCAS1-R	TTAGCATGCCTGCAATACACGAGTA
	PtCAS2-F	TCATGTGGAAACTTAAGATCGGAGCA
	PtCAS2-R	TTAAAGCGAGTGTAACACTTTCGAT
qRT-PCR	PtCAS1-F	ATACCGTACTCGTGTATTGCAG
	PtCAS1-R	CAGTAACAGTTGACAAGGCGA
	PtCAS2-F	CCAATATGGGCATTGGGTGAA
	PtCAS2-R	ATGTCAAACGACAACATCCCAA
	Actin-F	GATGACATGGAAAAGATTTGGCATC
	Actin-R	AAGGATGGCATGAGGGAGGGCGTAA