

Supplementary Information

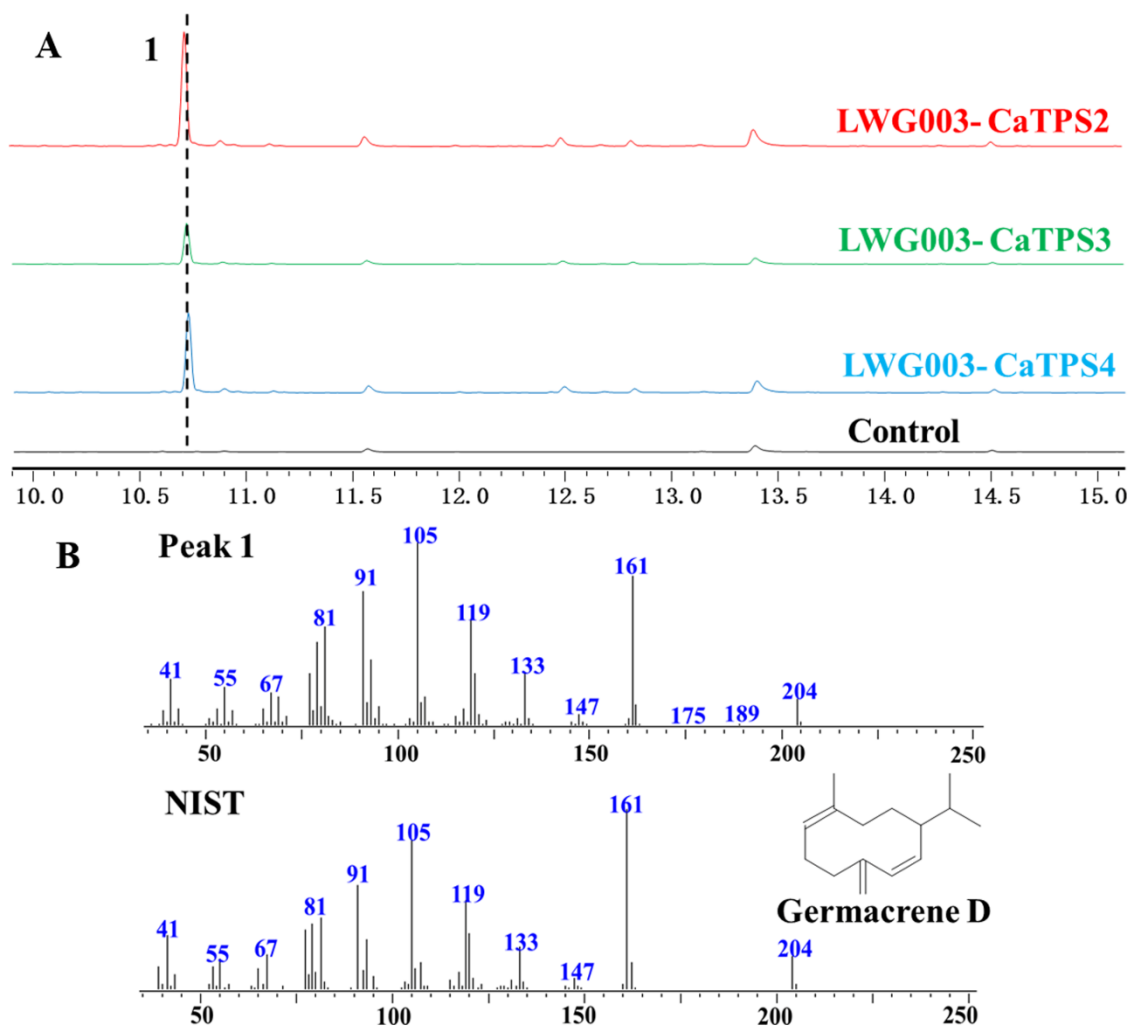
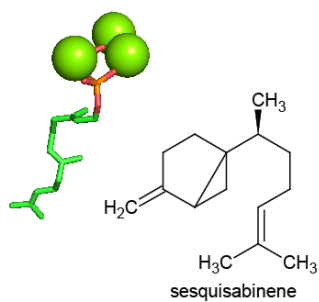
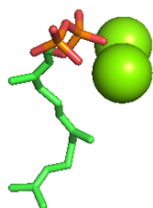


Figure S1. GC-MS analysis of assay products for *CaTPSs* in engineered yeast. (A) GC traces of the fermentation products of LWG003-*CaTPS2*, LWG003-*CaTPS3*, LWG003-*CaTPS4*, and empty vector as control. (B) Mass spectra comparison of the peaks with the compounds stored in the NIST17 library.

medium/long-chain-length
prenyl pyrophosphate synthase

SaSQS2



TEAS

XC1

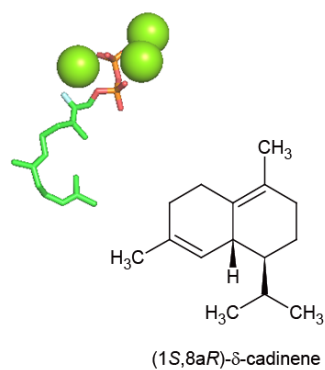
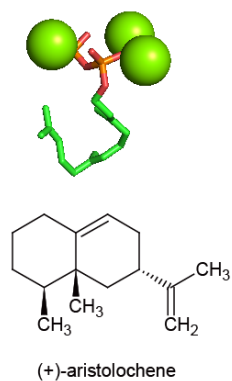


Figure S2. The corresponding shapes of FPP in STSs active site cavity with different cyclization pattern. The medium/long-chain length prenyl pyrophosphate synthase presents the acyclic STSs, SaSQS2 presents the C6-C1 cyclized STSs; TEAS and XC1 present C10-C1 cyclized STSs.

Table S1. Information of functional sesquiterpene TPSs in non-seed plants

Species	Genus	Gene name	GenBank	Products	Function
<i>Myriopteris eatonii</i>	<i>Polypodiales</i> <i>Pteridaceae</i>	Mon-GSXD-MTPSL3 [1]	APB88779	(E,E)- α -farnesene	A
<i>Pityrogramma trifoliata</i>	<i>Myriopteris</i> <i>Polypodiales</i> <i>Pteridaceae</i>	Mon-UJTT-MTPSL4 [1]	APB88780	protoillud-6-ene	U, T
<i>Woodsia scopulina</i>	<i>Pityrogramma</i> <i>Polypodiales</i> <i>Woodsiaceae</i> <i>Woodsia</i>	Mon-YJJY-MTPSL1 [1]	APB88781	protoillud-6-ene	U
<i>Selaginella Moellendorffi</i>	<i>Selaginellales</i> <i>Selaginellaceae</i> <i>Selaginella</i>	SmMTPSL1 [2] SmMTPSL17 [2] SmMTPSL22 [2] SmMTPSL26 [2] Hon-ApMTPSL7 [1]	J9R1J8 D8RLD3 D8RNZ9 J9QS25 APB88778	- - (E)-nerolidol 2-epi-(E)- β -caryophyllene β -acoradiene	L M1 A, U, B(GPP) C(1,11), M1 C(N1,6), M2, B(GPP)
<i>Anthoceros punctatus</i>	<i>Anthoceros</i>	ApMTPSL1 [3] ApMTPSL2 [3] ApMTPSL3 [3] ApMTPSL4 [3] ApMTPSL6 [3] AaMTPSL1 [3] AaMTPSL3 [3] AaMTPSL4 [3] AaMTPSL6 [3] AaMTPSL7 [3]	AVL27452 AVL27462 AVL27453 AVL27454 AVL27451 AVL27456 AVL27457 AVL27458 AVL27460 AVL27461	bicyclogermacrene γ -cuprenene δ -selinene - β -bisabolene - δ -selinene - β -bisabolene β -acoradiene	C(1,10), M1 M1, B(GGPP) C(1,10) C(N1,6) C(N1,6), B(GGPP) M2 C(1,10) C(N1,6), L C(N1,6), B(GGPP) C(N1,6), M2, B(GPP)
<i>Anthoceros agrestis</i>	<i>Anthocerotales</i> <i>Anthocerotaceae</i> <i>Anthoceros</i>				
<i>Pseudotaxiphyllum elegans</i>	<i>Hypnales</i> <i>Hypnaceae</i> <i>Pseudotaxiphyllum</i> <i>Hypnales</i>	Mos-QKQO-MTPSL3 [1]	APB88776	γ -curcumene	C(N1,6), M2
<i>Anomodon rostratus</i>	<i>Anomodontaceae</i> <i>Anomodon</i> <i>Jungermanniales</i>	Mos-VBMM-MTPSL3 [1] Liv-IRBN-MTPSL2 [1]	APB88777 APB88773	β -bisabolene bicyclogermacrene	C(N1,6), M1, B(GGPP) C(1,10), B(GPP)
<i>Scapania nemorea</i>	<i>Scapaniaceae</i> <i>Scapania</i>	Liv-IRBN-MTPSL4 [1]	APB88774	dactylol	M1

Species	Genus	Gene name	GenBank	Products	Function
<i>Marchantia polymorpha</i>	<i>Marchantiales</i>	MpMTPSL4 [4]	APP91789	5-hydroxy- α -gurjunene	C(N1,10), M1
		MpMTPSL3 [4]	APP91788	-	B(GPP)
	<i>Marchantiaceae</i>	MpMTPSL5 [4]	APP91790	-	U
	<i>Marchantia</i>	MpMTPSL7 [4]	APP91792	-	M1
		MpMTPSL9 [4]	APP91797	-	M2

Note: C indicates that the main product is cyclized, N indicates that FPP is first isomerized to form NPP and then cyclized, and the number is cyclization mode; A indicates that the main product is acyclized; U indicates single product; M1 indicates multiple products (the number of products is more than 5, and the proportion of main products is less than 50%); M2 indicates that the number of by-products is more than 5, and the proportion of each by-product is less than 1%. B indicates a bifunctional TPS, with other acceptable substrates in brackets; T indicates a tri functional TPS, with GPP, FPP and GGPP as substrates; M indicates monoterpene synthase activity in vivo; D indicates diterpene synthase activity in vivo; L is low TPS activity.

Table S2. Information of functional sesquiterpene TPSs in gymnosperms.

Species	Genus	Gene name	GenBank	Products	Function
<i>Ginkgo biloba</i>	<i>Ginkgoales</i>	GbTPS1 [5]	AIU94289	(E,E)-farnesol	A
	<i>Ginkgoaceae</i>	GbTPS2 [5]	AIU94290	α -bisabolene	C(N1-6)
	<i>Ginkgo</i>	TcTPS1 [6]	QGN65607	zingiberene	C(N1-6), M2, B(GPP)
		TcTPS2 [6]	QGN65608	-	C(N1,6), B(GPP)
<i>Taiwania cryptomerioides</i>		TcTPS3 [6]	QGN65609	δ -cadinene	C(N1-10)
		TcTPS4 [6]	QGN65610	germacradien-4-ol	C(N1-10), U
	<i>Cupressales</i>	TcTPS5 [6]	QGN65611	longifolene	C(N1-11), M2
	<i>Cupressaceae</i>	TcTPS6 [6]	QGN65612	cedrol	C(N1-6), M2, B(GPP)
	<i>Taiwania</i>	TcTPS7 [6]	QGN65613	murrolene or cadinene	C(N1-10), U, B(GPP)
		TcTPS8 [6]	QGN65614	germacrene D	C(N1-10)
		TcTPS9 [6]	QGN65615	caryophyllene	C(1,11)
		TcTPS12 [6]	QHZ00915	δ -cadinene/ germacrene-4-ol	C(N1-10), L
	<i>Cupressales</i>	CfCadS [7]	AFJ23663	β -cadinene	C(N1-10)
	<i>Cupressaceae</i>				
<i>Pinus sylvestris</i>	<i>Pinus</i>	Pt5 [9]	Q84KL5	α -farnesene	A, U
	<i>Pinaceae</i>	Ag4 [10]	O64404	δ -selinene/(E,E)-Germacrene B	C(1,10), M1, B(GPP)
	<i>Pinus</i>	Ag5 [10]	O64405	γ -Humulene	C(1,11), M1, B(GPP)
<i>Pinus taeda</i>	<i>Pinus</i>	Ag1 [11]	O81086	(E)- α -bisabolene	C(N1-6), U, B(GPP)
<i>Abies grandis</i>	<i>Pinaceae</i>	PmeTPS3 [12]	AAX07266	(Z)- γ -bisabolene	C(N1-6), U
	<i>Abies</i>	PmeTPS4 [12]	AAX07265	(E)- β -farnesene	A, U
	<i>Pseudotsuga</i>	PgTPS-Lonp [13]	ADZ45516	α -longipinene	C(N1-11),M1
<i>Picea sitchensis</i>		PgTPS-Hum [13]	ADZ45513	α -humulene	C(1-11),M1
<i>Picea glauca</i>	<i>Pinaceae</i>	PgTPS-Far/Oci [13]	ADZ45514	(E,E)- α -farnesene	A, U, B(GPP)
<i>P. glauca</i> \times <i>P. engelmannii</i>	<i>Pinaceae</i>	PgTPS-Lonf [13]	ADZ45515	Longifolene	C(N1-11)
	<i>Picea</i>	PaTPS-Far [14]	AAS47697	E,E- α -Farnesene	A, U
		PaTPS-Lon [14]	AAS47695	Longifolene	C(N1-11), M2
<i>Picea abies</i>		PaTPS-Bis [14]	AAS47689	E- α -Bisabolene	C(N1-6), U

Note as Table S1.

Table S3. Information of functional sesquiterpene TPSs in angiosperms.

Species	Genus	Gene name	GenBank	Products	Function
<i>Magnolia grandiflora</i>	Magnoliales	Mg25 [15]	ACC66281	β -cubebene/ α -muurolene	C(N1,10), M1
	Magnoliaceae	Mg17 [15]	ACC66282	(E)- α -bisabolene	C(N1,6), M1, M
<i>Cananga odorata</i>	Magnolia	CoTPS2 [16]	-	β -cubebene	C(N1,10)
	Magnoliales			α -bergamotene	C(N1,6)
	Annonaceae	CoTPS3 [16]	-		
<i>Laurus nobilis</i>	Cananga	LnTPS2 [17]	AKQ19358	δ -cadinene/ γ -cadinene	C(N1,10), M1
	Laurales				
	Lauraceae	LnTPS3 [17]	AKQ19359	(E,E)-nerolidol	A, D
<i>Piper Nigrum</i>	Laurus	PnTPS1/PnCPS	ARB08605	caryophyllene	C(1,11)
	Piperales	PnTPS2/PnCDS [18]	ARB08606	δ -cadinol	C(N1,10)
	Piper		AVY53326	Germacrene D	C(N1,10)/(1,10)
	Liliales	LoTPS2 [19]	AMT81306	(E, E)- α -farnesene	A, U
<i>Lilium 'Siberia'</i>	Liliaceae	LoTPS4 [19]	-	trans- α -bergamotene	C(N1,6), M
	Lilium				
	Asparagales				
<i>Vanda Mimi Palmer</i>	Orchidaceae	VMPSTS [20]	ABX57720	germacrene D	C(N1,10)/(1,10)
	Vanda				
<i>Freesia x hybrida</i>	Asparagales	FhTPS4 [21]	-	Nerolidol	A, U, M
	Iridaceae	FhTPS6 [21]	-	Selinene	C(1,10), B(GPP)
		FhTPS7 [21]	-	Copaene	C(N1,10), M1, B(GPP)
	Freesia	FhTPS8 [21]	-	α -Gurjunene	C(N1,10), M1
		OsTPS3 [22]	ABJ16553	(E)- β -caryophyllene	C(1,11), M2
<i>Oryza sativa</i>		OsTPS13 [22]	ABJ16554	(E,E)-farnesol	A
		OsLIS [23]	ACF05530	nerolidol	A, U, M
		Os08g07100 [23]	ACF05529	zingiberene	C(N1,6), M1, B(GPP)
		OsTPS1 [23]	ACF05531	(E)- β -caryophyllene	C(1,11)
<i>Oryza nivara</i>	Poales	OnTPS1 [24]	AIJ00875	(E)- β -caryophyllene	C(1,11)
<i>Oryza officinalis</i>	Poaceae	OoTPS1 [24]	AIJ00877	(E)- β -caryophyllene	C(1,11)
	Oryza			β -elemene	C(1,11)
<i>Oryza glaberrima</i>		OgTPS1[24]	AIJ00879	(E)- β -caryophyllene	C(1,11)
<i>Oryza barthii</i>		ObTPS1[24]	AIJ00878	(E)- β -caryophyllene	C(1,11)
<i>Oryza rufipogon</i>		OrTPS1 [24]	AIJ00876	Germacrene D	C(1,10)
<i>Oryza glumaepatula</i>		OgluTPS1[24]	AIJ00880	(E)- β -caryophyllene	C(1,11)

Species	Genus	Gene name	GenBank	Products	Function
<i>Triticum aestivum</i>	Poales	TaPS [25]	-	β -patchoulene	C(1,10)
	Poaceae				
<i>Eremochloa ophiuroides</i>	<i>Triticum</i>	EoMUS [26]	-	α -muurolene	C(1,10)
	Poales				
	Poaceae				
	<i>Eremochloa</i>				
<i>Panicum virgatum</i>	Poales	PvTPS01 [27]	-	cycloisosativene	-
	Poaceae	PvTPS02 [27]	-	(E)- β -farnesene	A, M2
	<i>Panicum</i>	PvTPS03 [27]	-	(E)- γ -bisabolene	C(N1,6), M2
		PvTPS05 [27]	-	α -selinene	C(1,10), M1
		PvTPS06 [27]	-	δ -cadinene	C(N1,10), M2
		PvTPS09 [27]	-	δ -cadinene	C(N1,10), M1
		PvTPS10 [27]	-	α -patchoulene	C(1,10), M1
		PvTPS11 [27]	-	(E)- β -caryophyllene	C(1,11)
		PvTPS14 [27]	-	(E)- β -caryophyllene	C(1,11), M1
		PvTPS16 [27]	-	(E)- β -farnesene	A, U
		PvTPS17 [27]	-	β -bisabolene	C(N1,6)
		PvTPS19 [27]	-	(E)- β -caryophyllene	C(1,11)
		PvTPS20 [27]	-	β -bisabolene	C(N1,6), M1
		PvTPS50 [27]	-	copaebe	C(N1,10), M1
		PvTPS55 [27]	-	Germacrene D	C(1,10)/(N1,10)
<i>Phyllostachys edulis</i>		PvTPS69 [27]	-	(E)- β -farnesene	A
		PvTPS79 [27]	-	γ -curcumene	C(N1,6), M1
		PvTPS83 [27]	-	(E)- γ -bisabolene	C(N1,6)
		PvTPS94 [27]	-	α -santalene	C(N1,6)
		PvTPS109 [27]	-	(E)- β -farnesene	A, U
<i>Chrysopogon zizanioides</i>	Poales	MoTPS2 [28]	AJP67536	(E, E)-farnesol	A, U
	Poaceae	MoTPS6 [28]	AJP67535	(E)-nerolidol	A, U
	<i>Phyllostachys</i>				
<i>Ananas comosus</i>	Poales	CzZIZS [29]	AJQ30127	(+) -zizaene	C(N1,6)
	Poaceae				
	<i>Chrysopogon</i>				
<i>Ananas comosus</i>	Poales	AcoTPS15 [30]	-	clovene	U, B(GPP)
	Bromeliaceae				
	<i>Ananas</i>				

Species	Genus	Gene name	GenBank	Products	Function
<i>Zea mays</i>	<i>Poales</i> <i>Poaceae</i> <i>Zea</i>	ZmTPS23 [31]	B2C4D0	(E)- β -caryophyllene	C(1,11)
		ZmpTPS23 [31]	ABY79213	(E)- β -caryophyllene	C(1,11)
		ZmmTPS23 [31]	ABY79212	(E)- β -caryophyllene	C(1,11)
		ZmhTPS23 [31]	ABY79210	(E)- β -caryophyllene	C(1,11)
		ZmTPS10 [32]	AAX99146	(E)- α -bergamotene, (E)- β -farnesene	C(N1,6)
		ZmmTPS10 [32]	ACT37403	(E)- α -bergamotene, (E)- β -farnesene	C(N1,6)
		ZmhTPS10 [32]	ACT37404	(E)- α -bergamotene, (E)- β -farnesene	C(N1,6)
		ZmTPS1 [33]	AAO18435	(E,E)-farnesol	A, B(GPP)
		ZmTPS4-B73 [34]	AAS88571	7-epi-sesquithujene, (S)- β -bisabolene	C(N1,6), M1, B(GPP)
		ZmTPS5-Del1 [34]	AAS88574	Sesquithujene	C(N1,6), M1, B(GPP)
		ZmTPS6 [35]	AAS88576	β -macrocarpene	C(N1,6), B(GPP)
		ZmTPS11 [35]	ACF58240	β -macrocarpene	C(N1,6), B(GPP)
		ZmTPS7 [36]	AAS88577	τ -Cadinol	C(N1,10), M2
		ZmTPS8 [37]	Q29VN3	germacrene D	C(1,10)/(N1,10), M1
		ZmTPS2 [38]	NP_001105854	(E)-nerolidol	A, U, T
		ZmTPS21 [39]	ATI25530	β -selinene	C(1,10)
		ZmEDS [40]	A0A1D6EFT8	eudesmane-2, 11-diol	C(1,10), M1
<i>Zea diploperennis</i>		ZdTPS23 [31]	ABY79209	(E)- β -caryophyllene	C(1,11)
		ZdTPS10 [32]	ACT37405	(E)- β -farnesene	A
<i>Zea perennis</i>		ZpTPS23 [31]	ABY79214	(E)- β -caryophyllene	C(1,11)
		ZpTPS10 [32]	ACT37406	(E)- β -farnesene	A
<i>Zea luxurians</i>		ZITPS23 [31]	ABY79211	(E)- β -caryophyllene	C(1,11)
<i>Sorghum bicolor</i>	<i>Poales</i> <i>Poaceae</i> <i>Sorghum</i>	SbTPS1 [41]	C5YHH7	Zingiberene	C(N1,6), M2, B(GPP)
		SbTPS2 [41]	C5YHI2	β -sesquiphellandrene	C(N1,6), M2, B(GPP)
		SbTPS1 [41]	C5YHH7	Zingiberene	C(N1,6), M2, B(GPP)
		SbTPS2 [41]	C5YHI2	β -sesquiphellandrene	C(N1,6), M2, B(GPP)
		SbTPS3 [41]	XP_021320232	(E)- β -farnesene	A, M2
		SbTPS4 [41]	-	(E)- β -caryophyllene	C(1,11), M2
<i>Zingiber zerumbet</i>	<i>Zingiberales</i> <i>Zingiberaceae</i>	SbTPS5 [41]	-	(Z)- γ -bisabolene	C(N1,6), M1
		ZSS1 [42]	BAG12020	α -humulene	C(1,11)
		ZSS2 [43]	B1B1U4	β -eudesmol	C(1,10)
<i>Zingiber officinale</i>	<i>Zingiber</i>	ZoTPS1 [44]	BAI67934	(S)- β -bisabolene	C(N1,6), U

Species	Genus	Gene name	GenBank	Products	Function
<i>Zingiber officinale</i>	<i>Zingiberales</i> <i>Zingiberaceae</i> <i>Zingiber</i>	ZoGED [45]	AAX40665	(+)-germacrene D	C(1,10), M2
		MT08 [46]	-	(Z)- β -farnesene	A, U, M
		MT06/06A [46]	-	(E)-nerolidol	A, M1, M
		MT02A [46]	-	epi- α -bisabolol	C(N1,6), M
		ST01 [46]	-	β -selinene	C(1,10), M2
		ST05 [46]	-	α -humulene	C(1,11)
		ST05A [46]	-	α -humulene	C(1,11)
		ST07 [46]	-	(-)-caryolan-1-ol	C(1,11)
		ST07A [46]	-	(-)-caryolan-1-ol	C(1,11)
		CITPS16 [47]	-	β -sesquiphellandrene	C(N1,6)
		CITPS15 [47]	-	γ -eudesmol	C(1,10), M1
		CITPS1 [47]	-	-	C(N1,6), M2
		ST00A/B [46]	-	(-)- α -zingiberene	C(N1,6), M2, B(GPP)
		MT00 [46]	-	(E)-nerolidol	A, U, M
<i>Curcuma longa</i>	<i>Zingiberales</i> <i>Zingiberaceae</i> <i>Curcuma</i>	MT17A2 [46]	-	cis- α -bisabolene	C(N1,6), M1, M
		ST02A4 [46]	-	(-)-neointermedeol	C(1,10), M2
		ST02B [46]	-	α -elemol	C(1,10), M2
		ST02C [46]	-	β -elemene	C(1,10), M2
		ST03 [46]	-	γ -amorphene	C(N1,10)
		CzTPS1a [48]	BBE32333	β -eudesmol	C(1,10)
<i>Curcuma zedoaria</i>		CzTps2 [48]	BBE32340	germacrene B	C(1,10), U
		LfTPS01 [49]	AIO10964	hedycaryol	C(1,10)
		LfTPS02 [49]	AMD82310	α -selinene	C(1,10)
		LfTPS03 [49]	AIO10966	trans- β -caryophyllene	C(1,11)
		LfTPS04 [49]	AMD82312	δ -cadinene	C(N1,10), M1
<i>Liquidambar formosana</i>	<i>Saxifragales</i> <i>Altingiaceae</i> <i>Liquidambar</i>	LfTPS05 [49]	AIO10968	nerolidol	A, U, B(GPP)
		MtTPS1 [50]	AAV36464	β -caryophyllene	C(1,11), B(GPP)
		MtTPS3 [50]	AAV36466	(3S) -(E)-nerolidol	A, U, T
		MtTPS5 [50]	ABB01625	(-)-cubebol	C(N1,10), M1, B(GPP)
		MtTPS10 [51]	-	himachalol	C(N1,11), M2
<i>Medicago Truncatula</i>	<i>Fabales</i> <i>Fabaceae</i> <i>Medicago</i>	PITPS2 [52]	AGS83387	(E)-nerolidol	A, U, T
		PITPS3 [53]	ARG42161	(E)-nerolidol	A, U, B(GPP)
		PITPS4 [53]	ARG42162	(E)-nerolidol	A, U, T

Species	Genus	Gene name	GenBank	Products	Function
<i>Sindora glabra</i>	<i>Fabales</i>	SgSTPS1 [54]	-	β -caryophyllene	C(1,11)
	<i>Fabaceae</i>	SgSTPS2 [54]	-	germacrene D	C(N1,10), M1, B(GPP)
	<i>Sindora</i>				
		CsTPS4FN [55]	ARE72260	Alloaromadendrene	C(1,10), B(GPP)
<i>Cannabis sativa</i>		CsTPS5FN [55]	ARE72256	farnesene	A, U, B(GPP)
		CsTPS7FN [55]	ARE72250	δ -selinene	C(1,10), M1, B(GPP)
	<i>Rosales</i>	CsTPS8FN [55]	ARE72252	γ -eudesmol, valencene	C(1,10), M1, B(GPP)
	<i>Cannabaceae</i>	CsTPS9FN [55]	ARE72251	β -caryophyllene	C(1,11)
	<i>Cannabis</i>	CsTPS18VF [56]	QCY41292	(E)-nerolidol	A, U, B(GPP)
		CsTPS19BL [56]	QCY41291	(E)-nerolidol	A, U, B(GPP)
		CsTPS16CC [56]	QCQ18307	GermacreneB	C(1,10), U
		CsTPS20CT [56]	QCY41290	Hedycaryol	C(1,10), U
	<i>Rosales</i>	HISTS1 [57]	ACI32639	α -humulene	C(1,11)
	<i>Cannabaceae</i>	HISTS2 [57]	ACI32640	germacrene A	C(1,10)
<i>Humulus lupulus</i>	<i>Humulus</i>				
<i>Malus domestica</i>		MdAFS [58]	AAO22848	(E,E)- α -farnesene	A
	<i>Rosales</i>	MdCAR-RG1 [58]	AGB14624	(E)- β -caryophyllene	C(1,11)
	<i>Rosaceae</i>	MdGDS-RG1 [58]	AGB14625	(-)-Germacrene D	C(1,10)/(N1,10)
	<i>Malus</i>	MdNES-RG1 [58]	AGB14626	(E)-nerolidol	A, U, L
		MdLIS-RG1 [58]	AGB14629	nerolidol	A, U, M
<i>Rosa chinensis</i>	<i>Rosales</i>	RcLIN-NERS1 [59]	AVR48790	nerolidol	A, B(GPP)
<i>Rosa hybrida</i>	<i>Rosaceae</i>	RcLIN-NERS2 [59]	AVR48791	nerolidol	A, M
	<i>Rosa</i>	FC0592 [60]	-	Germacrene D	C(1,10)/(N1,10), U
<i>Fragaria ananassa</i>	<i>Rosales</i>	FaNES1 [61]	P0CV94	(3S)-E-nerolidol	A, U, B(GPP)
	<i>Rosaceae</i>				
<i>Prunus dulcis</i>	<i>Fragaria</i>	PdTPS2 [62]	QEE82240	α -cis-bergamotene	C(N1,6), M1, B(GPP)
	<i>Rosales</i>	PdTPS4 [62]	QEE82242	α -cis-bergamotene	C(N1,6), M1, B(GPP)
	<i>Rosaceae</i>	PdTPS6 [62]	QEE82244	E- α -farnesene	A, B(GPP)
	<i>Amygdalus</i>	PdTPS7 [62]	QEE82245	E-nerolidol	A, U, B(GPP)
		CmTPS _{NY} [63]	NP_001284382	δ -cadinene	C(N1,10), M2
<i>Cucumis melo</i>	<i>Cucurbitales</i>	CmTPSD _{ul} [63]	NP_001284384	α -farnesene	A
<i>Cucumis sativus</i>	<i>Cucurbitaceae</i>	CsaFS [64]	AAU05951	(E,E)- α -farnesene	A, U, B(GPP)
	<i>Cucumis</i>	CsbCS [64]	AAU05952	(E)- β -caryophyllene	C(1,11), U

Species	Genus	Gene name	GenBank	Products	Function
<i>Tripterygium wilfordii</i>	<i>Celastrales</i> <i>Celastraceae</i> <i>Tripterygium</i>	TwCS [65]	AWV55521	Cryptomeridiol	C(1,10), B(GPP)
		TwTPS12 [66]	APD77393	Elemol	C(1,10)
		TwTPS13 [66]	APD77394	Torreyol	C(N1,10)
		TwTPS20 [66]	ANO43017	Acorenol	C(N1,6), L
		TwTPS22 [66]	ANO43012	Farnesene	A
		TwTPS29 [66]	ANO43019	Nerolidol	A, U
		TwNES [67]	AQA26342	(E)-nerolidol	A, U, B(GGPP)
		TwGES1 [67]	AQA26340	(E)-nerolidol	A, D, L
		PtTPS5 [68]	AII32469	-	C(1,10)
		PtTPS7 [68]	A0A076GAU5	hedycaryol	C(1,10)
<i>Populus trichocarpa</i>	<i>Malpighiales</i> <i>Salicaceae</i> <i>Populus</i>	PtTPS9 [68]	AII32473	(E)- β -caryophyllene	C(1,11)
		PtTPS11 [68]	A0A076GAR6	Germacrene A	C(1,10)
		PtTPS12 [68]	AII32476	γ -curcumene	C(N1,6), B(GPP)
		PtTPS15 [68]	AII32468	nerolidol	A, U, B(GPP)
		PtTPS1 [69]	F8TWC9	(-)-germacrene D	C(N1,10), M1
		PtTPS2 [69]	F8TWD0	(E,E)- α -farnesene	A, B(GPP)
		PtTPS3 [69]	F8TWD1	(3S)-nerolidol	A, B(GPP)
		PtTPS4 [69]	F8TWD2	(3S)-nerolidol	A, B(GPP)
		PtdTPS1 [70]	Q64K29	(-)-germacrene D	C(1,10)/(N1,10), M2
		RcSeTPS1 [71]	AEQ27766	(-)- α -copaene	C(N1,10)
<i>Ricinus communis</i>	<i>Malpighiales</i> <i>Euphorbiaceae</i> <i>Ricinus</i>	RcSeTPS5 [71]	AEQ27767	-	M1
		RcSeTPS7 [71]	AEQ27768	(E, E)- α -farnesene	A, U
		RcSeTPS10 [71]	AEQ27769	-	C(N1,6), M1
		RtTPS1 [72]	AXY92166	β -caryophyllene	C(1,11), B(GPP)
<i>Rhodomyrtus tomentosa</i>	<i>Myrtales</i> <i>Myrtaceae</i> <i>Rhodomyrtus</i>	RtTPS3 [72]	AXY92168	β -caryophyllene	C(1,11), B(GPP)
<i>Pelargonium \times hybridum</i>	<i>Geraniales</i> <i>Geraniaceae</i> <i>Pelargonium</i>	PhEDS [73]	AWF79083	10-epi- γ -eudesmol	C(1,10)
<i>Murraya koenigii</i>	<i>Sapindales</i> <i>Rutaceae</i> <i>Murraya</i>	MkTPS2 [74]	AQT33225	(E,E)- α -farnesene	A, U
<i>Toona sinensis</i>	<i>Sapindales</i> <i>Meliaceae</i> <i>Toona</i>	TsTPS2 [75]	BAJ46125	β -elemene	C(1,10), M2

Species	Genus	Gene name	GenBank	Products	Function	
<i>Citrus sinensis</i>	<i>Sapindales</i> <i>Rutaceae</i> <i>Citrus</i>	CsTPS1 [76]	AAQ04608	Valencene	C(1,10), U	
		CsSQS1 [77]	ATD14141	(Z)- β -cubebene	C(N1,10)	
		CsSQS2 [77]	ATD14142	β -cadinene	C(N1,10), M2	
		CsSQS3 [77]	ATD14143	β -farnesene	A	
		CsSQS4 [77]	ATD14144	Germacrene A	C(1,10), M1	
		CsSQS5a/b [77]	ATD14145/ ATD14146	alloaromadendrene	C(1,10), M1	
		CsSQS6a [77]	ATD14147	β -caryophyllene	C(1,11), L	
		CsSQS6b [77]	ATD14148	β -caryophyllene	C(1,11)	
		CsSQS7 [77]	ATD14150	β -caryophyllene	C(1,11)	
		CuSTS4 [78]	BAP75561	nerolidol	A, U, B(GPP)	
<i>Citrus unshiu</i>	<i>Sapindales</i> <i>Rutaceae</i> <i>Zanthoxylum</i>	RlemTPS4 [79]	BAP74389	δ -elemene	C(1,10), M2, B(GPP)	
<i>Citrus jambhiri</i>		CJFS [80]	AAK54279	(E)- β -farnesene	A, U	
<i>Citrus junos</i>		ZpTPS1 [81]	BBD88588	β -caryophyllene	C(1,11)	
<i>Zanthoxylum piperitum</i>		ZpTPS2 [81]	BBD88589	germacrene D	C(1,10)/(N1,10), M2	
<i>Arabidopsis Lyrata</i>		AlCarS [82]	ACN58564	(E)- β -caryophyllene	C(1,11)	
		AtTPS24 [83]	Q9LRZ6	(E,E)- α -farnesene	A, U, L, M	
		AtTPS14 [83]	Q84UV0	nerolidol	A, U, L, M	
		AtTPS21 [83]	Q84UU4	(-)-(E)- β -caryophyllene	C(1,11)	
<i>Arabidopsis thaliana</i>		<i>Brassicales</i> <i>Brassicaceae</i> <i>Arabidopsis</i>	AtTPS11/At5g44630 [84]	Q4KSH9	(+)- α -barbatene	C(N1,6), M1, B(GPP)
<i>Aquilaria microcarpa</i>		<i>Malvales</i> <i>Thymelaeaceae</i> <i>Aquilaria</i>	AtTPS12 [85]	NP_001328007	(Z)- γ -bisabolene	C(N1,6)
	AtTPS13 [85]		AEE83260			
	dGS-1 [86]		AHH25146	δ -guaiene	C(1,10)	
	ASS1 [87]		AFV99464	δ -guaiene	C(1,10)	
<i>Aquilaria sinensis</i>	ASS2 [87]		AFV99465	δ -guaiene	C(1,10)	
	ASS3 [87]		AFV99466	δ -guaiene	C(1,10)	
	As-SesTPS [88]		AGV40227	Nerolidol	A, M2	
	AcC2 [89]		ACY38195	δ -guaiene	C(1,10)	
<i>Aquilaria crassna</i>	AcC3 [89]		ACY38196	δ -guaiene	C(1,10)	
	AcC4 [89]		ACY38197	δ -guaiene	C(1,10)	
	AcHS1 [90]		A0A142F308	α -humulene	C(1,11)	
	AcHS2 [90]		A0A142F309	α -humulene	C(1,11)	
	AcHS3 [90]		A0A142F310	α -humulene	C(1,11)	

Species	Genus	Gene name	GenBank	Products	Function
<i>Vitis vinifera</i>	<i>Vitales</i> <i>Vitaceae</i> <i>Vitis</i>	VvValCS [91]	ACO36239	(+)-valencene	C(1,10)
		VvValGW [92]	AAS66358	(+)-valencene	C(1,10)
		VvGerD [92]	AAS66357	(-)-germacrene D	C(N1,10)
		VvGwECar1 [93]	ADR74192	(E)-caryophyllene	C(1,11)
		VvGwECar2 [93]	ADR74193	(E)-caryophyllene	C(1,11)
		VvGwECar3 [93]	ADR74194	(E)-caryophyllene	C(1,11)
		VvPNECar1 [93]	ADR74221	(E)-caryophyllene	C(1,11)
		VvPNECar2 [93]	ADR74222	(E)-caryophyllene	C(1,11)
		VvGwGerA [93]	ADR66821	germacrene A	C(1,10)
		VvGwaBer [93]	ADR74195	(E)- α -bergamotene	C(N1,6)
		VvGwGerD [93]	ADR74196	germacrene D	C(1,10)
		VvPNGerD [93]	ADR74197	germacrene D	C(1,10)
		VvCSaFar [93]	ADR74198	(E,E)- α -farnesene	A, U
		VvGwgCad [93]	ADR74199	γ -cadinene	C(N1,10)
		VvPNbCur [93]	ADR74200	(E)- γ -bisabolene	C(N1,6), M1
		VvPNSesq [93]	ADR74223	Sesquithujene	C(N1,6), M2
		VvPNaZin [93]	ADR74224	α -zingiberene	C(N1,6)
		VvPNSeInt [93]	CAO39293	selina-4,11-diene,	C(1,10), M1
		VvPNCuCad [93]	ADR74226	Cubebol, δ -cadinene	C(N1,10), M1
		VvPNaHum [93]	ADR74227	α -humulene	C(1,11)
		VvPNEb2epi Car [93]	ADR74228	(E)- β -caryophyllene	C(1,11)
		VvGwbOciF/	ADR74207/	(E,E)- α -farnesene	A, U, M
		VvCSbOciF [93]	ADR74208		
		VvPNLinNer1 [93]	ADR74210	(E)-Nerolidol	A, U, B(GPP)
		VvPNLinNer2 [93]	ADR74211	(E)-Nerolidol	A, U, B(GPP)
		VvCSLinNer [93]	ADR74212	(E)-Nerolidol	A, U, B(GPP)
		VvPNLNGl1 [93]	ADR74213	(E)-Nerolidol	A, U, T
		VvPNLNGl2 [93]	ADR74214	(E)-Nerolidol	A, U, T
		VvPNLNGl3 [93]	ADR74215	(E)-Nerolidol	A, U, T
		VvPNLNGl4 [93]	ADR74216	(E)-Nerolidol	A, U, T
		VvCSEnerGl [93]	ADR74219	(E)-Nerolidol	A, U, B(GGPP)
		VvPNEnerGl [93]	ADR74220	(E)-Nerolidol	A, U, B(GGPP)
		VvShTPS07 [94]	NP_001268063	Ylangene	C(N1,10), M1
		VvShTPS26 [94]	XP_002283070	α -Cubebene	C(N1,10), M1

		VvShTPS27 [94]	XP_019072407	Isocaryophyllene	C(1,11)
Species	Genus	Gene name	GenBank	Products	Function
<i>Cistus Creticus Subsp. Creticus</i>	<i>Malvales</i> <i>Cistaceae</i> <i>Cistus</i>	CcGer [95]	ACF94469	germacrene B	C(1,10)
<i>Gossypium hirsutum</i>	<i>Malvales</i> <i>Malvaceae</i>	GhTPS1 [96] GhTPS2 [96]	AGX84975 AGX84976	β -caryophyllene guaia-1(10),11-diene	C(1,11) C(1,10)
<i>Gossypium arboreum</i>	<i>Gossypium</i>	XC1/XC14 [97] CAD1-A [98] SaSQS1 [99] SaSQS2 [99] SaBS [99] SaSS [99] SaSSy [99]	AAA93064 NP_001316949 AIV42939 AIV42940 AIV42941 AGV01243 E3W202	(+)- δ -Cadinene (+)- δ -Cadinene Sesquisabinene Sesquisabinene (S)- β -bisabolene α -santalene α -santalene	C(N1,10), U C(N1,10), U C(N1,6), B(GPP) C(N1,6), B(GPP) C(N1,6), B(GPP) C(N1,6), M1 C(N1,6), M1
<i>Santalum album</i>	<i>Santalales</i> <i>Santalaceae</i> <i>Santalum</i>	SamonoTPS1 [100] SaSesquiTPS1 [100] SaTPS2 [101] SaTPS3 [101] SspiTPS4 [102] SspiSSy [103] SspiBS [103] SspiSesquiTPS [103] SauSSy [103] SauBS [103] SauSesquiTPS [103]	ACF24767 ACF24768 AZM65215 AZM65216 AJG35803 ADO87002 ADO87004 ADO87006 ADO87001 ADO87003 ADO87005	β -bisabolene germacrene D-4-ol sesquisabinene (E)-nerolidol sesquisabinene B α -santalene β -bisabolene hedycaryol α -santalene β -bisabolene a-humulene	C(N1,6), U, M C(1,10), M1, B(GPP) C(N1,6), M1, B(GPP) A, M1, B(GPP) C(N1,6), B(GPP) C(N1,6) C(N1,6) C(1,10) C(N1,6) C(N1,6), B(GPP) C(1,11), M2
<i>Santalum austrocaledonicum</i>		PmSTS [104] PmSTPS1 [105] PmSTPS2 [105] PhDS [106] CsNES [107]	AFN57631 - AWK77755 AHF22834 ARQ20729	β -sesquiphellandrene α -farnesene nerolidol drimenol (E)-nerolidol	C(N1,6) A, M1 A U A, U, B(GPP)
<i>Persicaria minor</i>	<i>Caryophyllales</i> <i>Polygonaceae</i> <i>Persicaria</i>	CsLIS/NES-1 [108] CsLIS/NES-2 [108] CsAFS [109] CbTPS1 [110] AdAFS1 [111] AdGDS1 [111]	AGX26045 - - A0A140KFG9 ACO40485 AAX16121	(E)-nerolidol (E)-nerolidol α -farnesene hedycaryol (E,E)- α -farnesene (+)-germacrene D	A, U, M A, U, B(GPP) A, U, B(GPP) C(1,10), U A, B(GPP) C(1,10)/(N1,10), U
<i>Camellia sinensis</i>	<i>Ericales</i> <i>Theaceae</i> <i>Camellia</i>				
<i>Camellia brevistyla</i>					
<i>Actinidia deliciosa</i>	<i>Ericales</i> <i>Actinidiaceae</i>				

<i>Actinidia chinensis</i>	<i>Actinidia</i>	AcNES1 [112]	AER36088	(S)-(E)-nerolidol	A, T
Species	Genus	Gene name	GenBank	Products	Function
<i>Ocimum basilicum</i>	<i>Lamiales</i> <i>Lamiaceae</i> <i>Ocimum</i>	ObSES [113]	AAV63785	β-selinene	C(1,10), M1
		ObCDS [113]	Q5SBP5	γ-cadinene	C(N1,10)
		ObZIS [113]	AAV63788	α-zingiberene	C(N1,6), M2, B(GPP)
		ObGDS [113]	AAV63786	germacrene D	C(1,10)/(N1,10)
<i>Ocimum kilimandscharicum</i>		OkBCS [113]	AKA94109	β-caryophyllene	C(1,11)
<i>Lavandula angustifolia</i>	<i>Lamiales</i> <i>Lamiaceae</i> <i>Lavandula</i>	LaBERS [114]	ABB73046	trans-α-bergamotene	C(N1,6), B(GPP)
		LaGERDS [115]	AGL98420	germacrene D	C(1,10)/(N1,10)
		LaCARS [115]	AGL98419	(E)-β-caryophyllene	C(1,11), U, B(GPP)
		LaCADS [115]	AGL98418	τ-cadinol	C(N1,10)
<i>Lavandula X Intermedia</i>		LiCPS [116]	AGU13712	9-epi-caryophyllene	C(1,11), U, B(GPP)
<i>Lavandula pedunculata</i>		LpGEAS [117]	AGN72800	germacrene A	C(1,10), U
<i>Lavandula stoechas</i>		LsGEAS [117]	AGN72803	germacrene A	C(1,10), U
<i>Lavandula viridis</i>		LvGEAS [117]	AGN72806	germacrene A	C(1,10), U
<i>Leucosceptrum canum</i>	<i>Lamiales</i> <i>Lamiaceae</i> <i>Leucosceptrum</i>	Lc-CedS [118]	QBP05430	cedrol	C(N1,6)
<i>Origanum vulgare</i>	<i>Lamiales</i> <i>Lamiaceae</i> <i>Origanum</i>	OvTPS3 [119]	ADK73619	(-)-germacrene D	C(1,10)/(N1,10), B(GPP)
		OvTPS4 [119]	ADK73618	alloaromadendrene	C(1,10), B(GPP)
		OvTPS6-d06 [119]	ADK73616	(E)-β-caryophyllene	C(1,11)
		OvTPS6-f02 [119]	ADK73615	(E)-β-caryophyllene	C(1,11)
<i>Mentha x piperita</i>	<i>Lamiales</i> <i>Lamiaceae</i> <i>Mentha</i>	MxpFAS [120]	O48935	(E)-β-farnesene	A, B(GPP)
		MxpSS1 [121]	Q5W283	cis-muurola-3,5-diene, cis-muurola-4(14),5-diene	C(N1,10)
		PatTpsA [122]	AAS86319	γ-curcumene	C(N1,6), L
<i>Pogostemon cablin</i>	<i>Lamiales</i> <i>Lamiaceae</i> <i>Pogostemon</i>	PatTpsBF2 [122]	AAS86320	(-)-germacrene D	C(1,10), L
		PatTpsCF2 [122]	AAS86321	(+)-germacrene A	C(1,10)
		PatTpsB15 [122]	AAS86322	(-)-germacrene D	C(1,10), M2
		PatTps177 [122]	Q49SP3	(-)-patchoulol	C(1,10), M2
		PTSiso [123]	AAS86323	germacrene A	C(1,10), M1
<i>Osmanthus fragrans</i>	<i>Lamiales</i> <i>Oleaceae</i> <i>Osmanthus</i>	OfTPS4 [124]	A0A109QXM3	α-farnesene	A, U

Species	Genus	Gene name	GenBank	Products	Function
<i>Antirrhinum majus</i>	<i>Lamiales</i>	AmNES/LIS-1 [125]	ABR24417	(3S)(E)-nerolidol	A, B(GPP)
	<i>Plantaginaceae</i> <i>Antirrhinum</i>	AmNES/LIS-2 [125]	ABR24418	(3S)(E)-nerolidol	A, U, M
<i>Phyla dulcis/ Lippia</i> <i>Dulcis</i>	<i>Lamiales</i> <i>Verbenaceae</i> <i>Phyla /Lippia</i>	LdTPS1 [126]	J7LP58	α -Copaene、 δ -cadinene	C(N1,10)
		LdTPS5 [126]	J7LMP2	bicyclogermacrene	C(1,10)
		LdTPS6 [126]	J7LJN5	β -caryophyllene	C(1,11), U
		LdTPS7 [126]	J7LQ09	trans- α -bergamotene	C(N1,6)
		LdTPS8 [126]	J7LH11	α -bisabolol	C(N1,6), U
		ShSBS [127]	ACJ38409	(+)-endo- β -bergamotene	C(N1,6), B(GPP)
		ShTPS9 [128]	AEM23825	germacrene B	C(1,10), B(GPP)
		ShTPS12 [128]	AEM23826	α -humulene	C(1,11), B(GPP)
		ShTPS17 [128]	AEM23828	valencene	C(1,10), B(GPP)
		ShTPS15b [128]	AEM23830	germacrene A	C(1,10)
<i>Solanum habrochaites</i>		ShTPS14a [128]	AEM23827	(Z)- α -bisabolene	C(N1,6), B(GPP), M1
		ShTPS14b [128]	AEM23829	β -bisabolene	C(N1,6), M1
		SSTLH1 [129]	Q9FQ27	germacrene B	C(1,10), U
		SSTLH2 [129]	AAG41892	Germacrene D	C(1,10)
		ShZIS [130]	AFJ67794	7-epizingiberene	C(N1,6)
		SITPS9(STLE1) [128]	AEM05858	germacrene C	C(1,10), B(GPP)
		SITPS12 [128]	AEP82783	β -caryophyllene	C(1,11), B(GPP)
		SITPS17 [128]	AEP82780	valencene	C(1,10), B(GPP)
		SITPS14 [128]	AEP82782	(Z)- γ -bisabolene	C(N1,6), B(GPP)
		SITPS31 [128]	AEM23833	viridiflorene	C(1,10), U
		SITPS36 [131]	AEP82770	-	-
		SITPS32 [131]	AEP82773	viridiflorene	C(1,10)
		SITPS38 [131]	AEP82768	α -bergamotene	C(N1,6)
		SITPS37 [131]	AEP82769	nerolidol	A, B(GPP)
		SITPS39 [131]	AEP82767	nerolidol	A, B(GPP)
<i>Solanum lycopersicum</i>		SSTLE2 [129]	AAG41890	δ -elemene	C(1,10)
		SITPS5(LeMTS1) [131]	AAX69063	(E)-nerolidol	A, U, M
		pLE11.3 [132]	-	germacrene C	C(1,10), B(GPP)
		pLE14.2 [132]	AAC39432	germacrene C	C(1,10)
		pLE20.3 [132]	AAC39431	germacrene C	C(1,10)
<i>Solanum elaeagnifolium</i>		CI7653 [133]	-	β -caryophyllene	C(1,11)

Species	Genus	Gene name	GenBank	Products	Function
<i>Hyoscyamus muticus</i>	<i>Solanales</i>	HuVS1 [134]	Q39978	vetispiradiene	C(1,10), U
	<i>Solanaceae</i>	HuVS2 [134]	Q39979	vetispiradiene	C(1,10), U
	<i>Hyoscyamus</i>	HuVS3 [134]	Q39980	vetispiradiene	C(1,10), U
<i>Capsicum annuum</i>	<i>Solanales</i>				
	<i>Solanaceae</i>	PEAS [135]	AAC61260	5-epi-aristolochene	C(1,10), U
<i>Nicotiana tabacum</i>	<i>Capsicum</i>				
		EAS110 [136]	AAP79448	5-epi-aristolochene	C(1,10), U
<i>Nicotiana attenuata</i>	<i>Solanales</i>	TEAS [137]	Q40577	5-epi-aristolochene	C(1,10)
	<i>Solanaceae</i>	NaEAS12 [138]	Q84LF2	5-epi-aristolochene	C(1,10), U
	<i>Nicotiana</i>	NaEAS34 [138]	Q84LF1	5-epi-aristolochene	C(1,10), U
<i>Matricaria recutita</i>		NaEAS37 [138]	Q84LF0	5-epi-aristolochene	C(1,10), U
		MrTPS1 [139]	A0A075W0Z3	(-)- α -bisabolol	C(N1,6), U
		MrTPS4 [139]	A0A075W3D9	Bicyclogermacrene	C(1,10), U
	<i>Asterales</i>	MrTPS6 [139]	A0A075W2D6	β -farnesene	A, U
	<i>Asteraceae</i>	MrTPS1' [140]	AFM43734	(-)-(E)- β -caryophyllene	C(1,11)
	<i>Matricaria</i>	MrTPS2' [140]	AFM43735	α -isocomene	C(1,11)
		MrTPS3' [140]	I6QSN0	(+)-germacrene A	C(1,10), U
		MrTPS5' [140]	AFM43738	(-)-germacrene D	C(1,10)/(N1,10), M2
		Mr-bFS [141]	AIW60869	(E)- β -farnesene	A, U
	<i>Asterales</i>	Sc1 [142]	CAC36896	(+)-(10R)-germacrene A	C(1,10)
<i>Solidago Canadensis</i>	<i>Asteraceae</i>	Sc19 [143]	Q70EZ6	(-)-germacrene D	C(1,10)
	<i>Solidago</i>	Sc11 [143]	Q70EZ7	(+)-germacrene D	C(1,10)
<i>Ixeris dentate</i>	<i>Asterales</i>				
	<i>Asteraceae</i>	IdGAS [144]	AAL92481	(+)-germacrene A	C(1,10), U
<i>Barnadesia spinosa</i>	<i>Ixeris</i>				
	<i>Asterales</i>	BsGAS1 [145]	AIX97167	germacrene A	C(1,10), U
	<i>Asteraceae</i>	BsGAS2 [145]	AIX97168	germacrene A	C(1,10), U
<i>Taraxacum officinale</i>	<i>Barnadesia</i>				
	<i>Asterales</i>	ToGAS1 [146]	ALY05868	(+)-germacrene A	C(1,10), U
	<i>Asteraceae</i>	ToGAS2 [146]	ALY05869	(+)-germacrene A	C(1,10), U
<i>Tanacetum cinerariifolium</i>	<i>Taraxacum</i>				
	<i>Asterales</i>	TcGAS [147]	AGO03788	germacrene A	C(1,10), U
<i>Tanacetum parthenium</i>	<i>Asteraceae</i>	TpGAS [148]	AEH41844	germacrene A	C(1,10), U

		TpCarS [148]	AEH41845	b-caryophyllene	C(1,11)
Species	Genus	Gene name	GenBank	Products	Function
<i>Eremanthus erythropappus</i>	Asterales Asteraceae <i>Eremanthus</i>	EeBOS1 [149]	AYJ71561	(-)- α -bisabolol	C(N1,6), U
<i>Cichorium intybus</i>	Asterales Asteraceae <i>Cichorium</i>	CiGASsh [150]	Q8LSC2	(+)-germacrene A	C(1,10), U
		CiGASlo [150]	Q8LSC3	(+)-germacrene A	C(1,10), U
<i>Lactuca sativa</i>	Asterales Asteraceae <i>Lactuca</i>	LTC1 [151]	AAM11626	germacrene A	C(1,10), U
		LTC2 [151]	AAM11627	germacrene A	C(1,10), U
		HaTPS12-K7 [152]	AME16497	(Z)- γ -bisabolene	C(N1,6), U
		HaTPS12-K11 [152]	AME16498	(Z)- γ -bisabolene	C(N1,6), U
<i>Helianthus annuus</i>	Asterales Asteraceae <i>Helianthus</i>	HaGAS1 [153]	AAAY41421	germacrene A	C(1,10), U
		HaGAS2 [153]	ABY49939	germacrene A	C(1,10), U
		HaTPS2 (HaCS) [153]	ACA33926	δ -cadinene	C(N1,10), M1
		HaGAS3 [154]	ACZ50512	germacrene A	C(1,10)
<i>Xanthium Strumarium</i>	Asterales Asteraceae <i>Xanthium</i>	XsTPS1 [155]	AMP42987	germacrene D	C(1,10)/(N1,10)
		XsTPS2 [155]	AMP42991	guaia-4,6-diene	C(1,10), U
		XsTPS3 [155]	AJT60315	germacrene A	C(1,10), U
		CsTPS1 [156]	-	α -muurolene	C(N1,10), U
<i>Centaurea stoebe</i>	Asterales Asteraceae <i>Centaurea</i>	CsTPS4 [156]	-	(E)- β -caryophyllene	C(1,11)
		CsTPS5 [156]	-	daucadiene	M2
		CsTPS7 [156]	-	(E)- α -bisabolene	C(N1,6)
		CsTPS8 [156]	-	α -zingiberene	C(N1,6), L
<i>Achillea millefolium</i>	Asterales Asteraceae <i>Achillea</i>	AmGAS [157]	AGD80135	Germacrene A	C(1,10),B(GPP)
<i>Senecio scandens</i>	Asterales Asteraceae <i>Senecio</i>	SsNES [158]	MH518312	(E)-nerolidol	A, U
<i>Cynara cardunculus</i>	Asterales Asteraceae <i>Cynara</i>	CcGAS [159]	AET95645	(+) germacrene A	C(1,10), U
<i>Daucus carota</i>	Apiales Apiaceae	DcTPS1 [160]	XP_017214942	(E)- β -caryophyllene	C(1,11), B(GPP)

Daucus

Species	Genus	Gene name	GenBank	Products	Function
<i>Artemisia absinthium</i>		AabKOS [161]	A0A1L7NYG2	Koidzumiol	C(N1,6), U
<i>Artemisia kurramensis</i>		AkBOS [161]	A0A1L7NYG3	(+)- α -Bisabolol	C(N1,6), U
		AmBOS [161]	A0A1L7NYF8	(+)- α -Bisabolol	C(N1,6), U
<i>Artemisia maritima</i>		AmAOS [162]	BBG75037	4-amorphen-11-ol	C(N1,6)
		AaBOS [163]	M4GGS0	α -bisabolol	C(N1,6), M2
		AaGAS [164]	ABE03980	germacrene A	C(1,10), U
<i>Artemisia annua</i>	<i>Asterales</i>	QHS1 [165]	AAL79181	β -caryophyllene	C(1,11)
	<i>Asteraceae</i>	AaADS [166]	AFA34434	amorpha-4,11-diene	C(N1,6), M2
	<i>Artemisia</i>	AaECS1 [167]	CAC08805	epi-cedrol	C(N1,6), M2, B(GPP)
		AaBFS [168]	AAX39387	(E)- β -farnesene	A, U
		AabrBOS1 [169]	-	(+)- α -bisabolol	C(N1,6), U
		AabrBOS2 [169]	-	(+)- α -bisabolol	C(N1,6), U
<i>Artemisia abrotanum</i>		AabrBOS3 [169]	-	(+)- α -bisabolol	C(N1,6), U
		AabrBOS4 [169]	-	(+)- α -bisabolol	C(N1,6), U
		AabrSPS [169]	-	7-epi-silphiperfol-5-ene	C(1,11), U
		TgTPS1 [170]	AFV09098	trans-nerolidol	A
<i>Thapsia garganica</i>		TgTPS2 [170]	AFV09099	kunzeaol	C(1,10), M2
	<i>Apiales</i>	TITPS820 [171]	AZL40026	epikunzeaol	C(1,10), U
	<i>Apiaceae</i>	TITPS509 [171]	AZL40028	Guaiol	C(1,10), M1
<i>Thapsia laciniata</i>	<i>Thapsia</i>	TITPS18983 [171]	AZL40027	farnesene	A, M1
		TITPS7414 [172]	AMU19318	(-)-germacrene D	C(1,10)/(N1,10)
		AscTps1 [48]	BBE32330	β -caryophyllene	C(1,11)
<i>Acanthopanax sciadophylloides</i>	<i>Apiales</i>	AscTps2a [48]	BBE32331	germacrene D	C(1,10)/(N1,10), U
	<i>Araliaceae</i>	AscTPS3 [48]	BBE32339	nerolidol	A, B(GPP)
<i>Acanthopanax sieboldianus</i>	<i>Acanthopanax</i>	AsiTPS1a [48]	BBE32335	β -caryophyllene	C(1,11)
		VoTPS1' [173]	AFR42417	germacrene C	C(1,10)
	<i>Dipsacales</i>	VoTPS2' [173]	AFR42418	valerena-4,7(11)-diene	C(1,10)
<i>Valeriana Officinalis</i>	<i>Caprifoliaceae</i>	VoTPS1 [174]	AGB05610	valerena-1,10-diene	C(1,10), B(GPP)
	<i>Valeriana</i>	VoTPS7 [174]	AGB05616	germacrene C	C(1,10), B(GPP)
		VoTPS3' [175]	AFR42419	(-)-drimenol	U

Note as Table S1.

Table S4. Plasmids and strains used in this study

Name	Description	Resource
Plasmids		
pESC-URA	2 μ , URA3	stored in the lab
pESCU-CaTPS2	cloning <i>CaTPS2</i> into pESC-URA	this study
pESCU-CaTPS3	cloning <i>CaTPS3</i> into pESC-URA	this study
pESCU-CaTPS4	cloning <i>CaTPS4</i> into pESC-URA	stored in the lab
Strains		
LWG003	CEN.PK2-1C derivative; <i>leu2-3,112:: G418^R_T_{ERG19}(RC)-ERG19(RC)-P_{GAL1}(RC)_P_{GAL10}-ERG8-T_{ERG8}; his3Δ1:: HIS3 _T_{ERG12}(RC)-ERG12(RC)-P_{GAL1}(RC)_P_{GAL10}-ERG10-T_{ERG10}; ade1Δ:: T_{HMG1}(RC)-tHMG1(RC)-P_{GAL1}(RC)_P_{GAL10}-IDI1-T_{IDI1}_ADE1; <i>ura3-52:: T_{HMG1}(RC)-tHMG1(RC)-P_{GAL1}(RC)_P_{GAL10}-ERG13-T_{ERG13}; trp1-289:: T_{HMG1}(RC)-tHMG1(RC)-P_{GAL1}(RC)_P_{GAL10}-ERG20-T_{ERG20}_TRP1; ΔGAL80::P_{GAL2}-<i>upc2-1</i>-T_{ADH1}; ΔPERG9:: PHXT1</i></i>	stored in the lab
LWG003- CaTPS2	LWG003, pESCU-CaTPS2	this study
LWG003- CaTPS3	LWG003, pESCU-CaTPS3	this study
LWG003- CaTPS4	LWG003, pESCU-CaTPS4	this study

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