

Supplementary Table S1. Primers used in this study

purpose for use	gene/vector	sequence
Vector construction of pENTR_mGFP	<i>mGFP</i>	CACCATGGTGAGCAAGGGCGAGGA TTACTTGTACAGCTCGTCCATGCC
Vector construction of pENTR_LePGT1	<i>LePGT1</i>	GCAGGCTCCGGCGCCGCCACCATGGTTTCCAGCAAACAAACACAG AGCTGGGTCCGGCGGCCAGGAAACAATCTTCCAAGTAAGATTCCG
Vector construction of pENTR_LePGT1	<i>pENTR/D-TOPO</i>	CGCGCCGACCCAGCTTTCTTGTACAAAGT GGCCGCGAGCCTGCTTTTTTGTACAAAGT
Vector construction of pGWB505_LeDI2	<i>LeDI2</i>	CACCATGGCTTCAAGAACTCTATTGCG TGGGCAGCTCCATCCAGAAGG
Vector construction of pBin19_LeDI2-GFP	<i>LeDI2-GFP</i>	ATCTCTAGACCTTACCATGGCTTCAAGAAACTC
Vector construction of pRI201AN_LeDI2-GFP	<i>LeDI2-GFP</i>	ATCGTCGACCTTACCATGGCTTCAAGA
Vector construction of pBin19_LeDI2-GFP and pRI201AN_LeDI2-GFP	<i>LeDI2-GFP</i>	TTCGAGCTCGGGCCGCTTTACTTGTAC
Site direct mutagenesis in <i>Xba</i> I in <i>LeDI2-GFP</i>	<i>LeDI2-GFP</i>	CATGGATCCTCTGGATCGAACCACCTTTGTACAA GTGGTTCGATCCAGAGGATCCATGGTGAGCAAG
Colony PCR and genotyping of hairy root	<i>GFP_h</i>	ATGGCCAGACTCACAAAGCATATTG TCAAAGCTCATCGTGGTGGTGG
Genotyping of hairy root	<i>Actin</i>	GTGTTGTGGCTTTATGAATCCAGTCA ATCTCAGATCCGGAAGAAGAAATACGA
Genotyping of hairy root	<i>GFP</i>	ATGGTGAGCAAGGGCGAGGAGCTGT CTTGTACAGCTCGTCCATGCCGTGAGTGAT
Colony PCR and genotyping of hairy root	<i>NPTII</i> (kanamycin resistant gene)	ATGATTGAACAAGATGGATTGC TCAGAAAGAACTCGTCAAGAAGG
Colony PCR and genotyping of hairy root	<i>HPT</i> (hygromycin resistant gene)	TGCCAGTCATAGCCGAATAGCCTCTCCAC CGGAAGTGCTTGACATTGG AGAAGAAGATGTTGGCGACC

Supplementary Table S2. Medium composition

	compound	amount (l ⁻¹)	callus induction medium	inoculation buffer	co-cultivation medium	root induction medium
1/2 MS	MgSO ₄ · 7H ₂ O	185 mg	+	+	+	+
	CaCl ₂ · 2H ₂ O	220 mg	+	+	-	+
	KNO ₃	950 mg	+	+	-	+
	NH ₄ NO ₃	825 mg	+	+	-	+
	KH ₂ PO ₄	85 mg	+	+	-	+
	FeSO ₄ · 7H ₂ O	13.9 mg	+	+	+	+
	Na ₂ -EDTA	18.65 mg	+	+	+	+
	MnSO ₄ · 4H ₂ O	11.15 mg	+	+	+	+
	ZnSO ₄ · 7H ₂ O	4.3 mg	+	+	+	+
	CuSO ₄ · 5H ₂ O	0.0125 mg	+	+	+	+
	CoCl ₂ · 6H ₂ O	0.0125 mg	+	+	+	+
	KI	0.415 mg	+	+	+	+
	H ₃ BO ₃	3.1 mg	+	+	+	+
	Na ₂ MoO ₄ · 2H ₂ O	0.125 mg	+	+	+	+
	<i>myo</i> -inositol	100 mg	+	+	+	+
	Nicotinic acid	0.5 mg	+	+	+	+
	Pyridoxine hydrochloride	0.5 mg	+	+	+	+
	Thiamine hydrochloride	0.1 mg	+	+	+	+
	L-glycine	2 mg	+	+	+	+
	Sucrose	10 g	+	+	+	+
	Kinetin	100 µmol	+	-	-	-
	Indole acetic acid	10 µmol	+	-	-	-
	Acetosyringone	100 µmol	-	+	+	-
Meropenem trihydrate	20 mg	-	-	-	+	
Agar	10 g	+	-	+	+	

+, contained; -, not contained