

Supplemental Table 1. Primers used in this study.

Primer	Name	Forward 5'-3'	Reverse 5'-3'
CDS amplification	<i>OrNCED1</i> -CDS	ATGCAAAGGATTGCCCCTGC	TTGGTGCTGTGACTGGAGCTC
	<i>OrNCED3</i> -CDS	ATGGCGACGATCACGACG	GGCCTGGGTGGTGAGCTC
	<i>OrNCED5</i> -CDS	ATGCCGACCACCTTCACGC	GGCCTGCGTGGCGAGCTC
Genome editing	<i>OrNCED1</i> -cas9	CAACACGTTCATCGACCCGC	GCGGGTCGATGAACGTGTTG
		gttttagagctagaaat	cggcagccaagccagca
	<i>OrNCED3</i> -cas9-1	CCGCCCCGCGCGCGCTGC	GCAGCGCGCGCGGGGCGG
		gttttagagctagaaat	cggcagccaagccagca
	<i>OrNCED3</i> -cas9-2	ATCGCCGGCAACTTCGCGC	GCGCGAAGTTGCCGGCGAT
		gttttagagctagaaat	caacacaagcggcagc
Promoter amplification	<i>OrNCED5</i> -cas9	CCGCACGCGCTGCCGCGGA	TCCGCGGCAGCGCGTGCGG
		gttttagagctagaaat	cggcagccaagccagca
	<i>OrNCED3</i> -Pro	tatgaccatgattacgaattcCCCTTTGATCAGCAT	acgacggccagtccaagcttATCGCGTCGATCGC
		GTAAACAT	ACAA
	<i>OrNCED5</i> -Pro	tatgaccatgattacgaattcCATCAACTAAGAGCT	acgacggccagtccaagcttGGCTGTCCTACAAG
		CAACGAGTACTC	AGCAGAACA
Mutation genotyping	<i>OsNCED1</i> -JC	ATAGCCGCACGGTTAATCTCA	AAGCCGGAGAAGACGTTGG
	<i>OsNCED3</i> -JC	TCCCAAACCATCCAAACCG	GCCGTTGCGTATCCTGACG
	<i>OsNCED5</i> -JC	CTCCTTCTTCCCGCCAACT	GCCGTTGAAGTAGACGAGGC
<i>Hyg</i> gene detection	<i>Hygromycin (hyg)</i>	ACGGTGTCGTCCATCACAGTTTGCC	TTCCGGAAGTGCTTGACATTGGGGA

Supplemental Table 2. Culture medium used in this study.

Medium	Components (1 L)
Callus induction (pH 5.8)	N₆ Macronutrient^a: 2830 mg KNO₃, 463 mg (NH₄)₂SO₄, 400 mg KH₂PO₄, 185 mg MgSO₄·7H₂O, 166 mg CaCl₂·2H₂O B₅ Micronutrient^a: 27.8 mg FeSO₄·7H₂O, 37.3 mg Na₂EDTA, 10 mg MnSO₄·4H₂O, 2 mg ZnSO₄·7H₂O, 3 mg H₃BO₃, 0.75 mg KI, 0.025 mg CuSO₄·5H₂O, 0.25 mg Na₂MoO₄·2H₂O, 0.025 mg CoCl₂·6H₂O Organics: 2 mg glycine, 1 mg thiamine, 0.5 mg pyridoxine, 0.5 mg nicotinic acid, 100 mg <i>myo</i>-inositol, 2878 mg proline, 500 mg L-glutamine, 600 mg casin hydrolysate, 30000 mg sucrose, 4600 mg phytigel (Sigma) Plant hormone: 2,4-D (1.5, 2.5, 3.5, 4.5 and 5.5 mg)
AA (pH 5.2)	Macronutrient: 2950 mg KCl, 170 mg Na₂HPO₄, 500 mg MgSO₄·7H₂O, 150 mg CaCl₂·2H₂O 27.8 mg FeSO₄·7H₂O, 37.3 mg Na₂EDTA, 10 mg MnSO₄·4H₂O, 2 mg ZnSO₄·7H₂O, 3 mg H₃BO₃, 0.75 mg KI, 0.025 mg CuSO₄·5H₂O, 0.25 mg Na₂MoO₄·2H₂O, 0.025 mg CoCl₂·6H₂O Organics: 2 mg glycine, 10 mg thiamine, 1 mg pyridoxine, 1 mg nicotinic acid, 100 mg <i>myo</i>-inositol, 876 mg L-glutamine, 500 mg casin hydrolysate, 68500 mg sucrose, 36000 mg glucose, 216 mg L-asparagine, 176 mg L-arginine, 20 mg acetosyringone(Sangon Biotech, China)
Co-cultivation (pH 5.8)	N₆ Macronutrient + B₅ Micronutrient Organics: 2 mg glycine, 1 mg thiamine, 0.5 mg pyridoxine, 0.5 mg nicotinic acid, 100 mg <i>myo</i>-inositol, 500 mg L-glutamine, 600 mg casin hydrolysate, 30000 mgsucrose, 10000 mg glucose, 20 mg acetosyringone, 4600 mg phytigel 2.5 mg 2,4-D
Selection (pH 5.8)	N₆ Macronutrient + B₅ Micronutrient + Callus induction organics Plant hormone: 2.5 mg 2,4-D <i>Hygromycin</i>B (Invitrogen, USA): 30 mg Carbenicillin(Sangon Biotech, China): 400 mg
Regeneration (pH 5.8)	MSMacronutrient: 1900 mg KNO₃, 1650 mg NH₄NO₃, 170 mg KH₂PO₄, 370 mg MgSO₄·7H₂O, 440 mg CaCl₂·2H₂O MSMicronutrient: 27.85 mg FeSO₄·7H₂O, 37.25 mg Na₂EDTA, 22.3 mg MnSO₄·4H₂O, 8.6 mg ZnSO₄·7H₂O, 6.2 mg H₃BO₃, 0.83 mg KI, 0.025 mg CuSO₄·5H₂O, 0.25 mg Na₂MoO₄·2H₂O, 0.025 mg CoCl₂·6H₂O Organics: 2 mg glycine, 0.4 mg thiamine, 0.5 mg pyridoxine, 0.5 mg nicotinic acid, 100 mg <i>myo</i>-inositol, 2878 mg proline, 2000 mg casin hydrolysate, 30000 mg sucrose, 30000 mg D-sorbitol, 4200 mg phytigel Plant hormones^b: 2 mg ZT, 0.1 mg NAA
Root-induction (pH 5.8)	MS Macronutrient + MS Micronutrient Organics: 2 mg glycine, 0.4 mg thiamine, 0.5 mg pyridoxine, 0.5 mg nicotinic acid, 100 mg <i>myo</i>-inositol, 2000 mg casin hydrolysate, 30000 mg sucrose, 4200 mg phytigel Plant hormone: 0.135 mg NAA

^a N₆ Macronutrient, B₅ Micronutrient componentsreferred to Linand Zhang (2005).

^b For effect of KT or ZT, different concentrations of KT or ZT and NAA combinations weredesigned: 1 mg/L KT + 0.5 mg/L NAA, 2 mg/L KT + 0.1 mg/L NAA, 2 mg/L KT + 0.5 mg/L NAA, 1 mg/L ZT + 0.5 mg/L NAA, 2 mg/L ZT + 0.1 mg/L NAA, 2 mg/L ZT + 0.5 mg/L NAA.