Supplementary figures







22 Supplementary Fig. S2. Scanning electron microscopy (SEM) observation of the mature pistils, anthers and

23 pollen grains in WT and *des1*. Comparisons of SEM observations in WT (A, C, E, G, I, L) and *des1* (B, D, F, H, J,

24 K, M, N) mature pistils (A, B), anthers (C, D), anther epidermis (E, F), anther inner surfaces (G, H), pollen grains,

- 25 (I, J, K), and pollen exine (L, M, N). Scale bars represent 1 mm in (A-D), 10 μm in (E, F), 100 μm in the enlarged
- 26 of (E, F), 5 μm in (G, H, L, M, N), 1 μm in the enlarged of (G, H, L, M, N), and 20 μm in (I, J, K).
- 27



29 Supplementary Fig. S3. Statistical data of the seed-setting rate of the reciprocal crosses. Data are Means \pm SD

- 30 from 3 replicates with > 40 emasculated spikelets per replicate, and different letters indicate significant differences
- 31 as determined by Duncan's test (P < 0.05).
- 32



33

34 Supplementary Fig. S4. Paraffin section analysis of the embryo sac development in WT and des1. (A-E) Images 35 of embryo sacs in WT at megasporocyte stage (A), dyad (B), tetrad (C), functional megaspore formation stage (D) 36 and mature embryo sac stage (E), respectively. (F-H) Images of embryo sacs in des1 at megasporocyte formation 37 stage (F), tetrad (G) and functional megaspore formation stage (H), respectively. Part (I) shows that the so-called 38 functional megaspore degenerated along with the other three megaspores in des1. Part (J) shows no embryo sac 39 formation in des1. MMC, megaspore mother cell; DM, degenerated megaspore; FM, functional megaspore; A, 40 antipodal cell; P, polar nucleus; E, egg cell; NFM, non-functional megaspore; NR, nucellar remnants. Bars = 50 41 μm.





43 Supplementary Fig. S5. Microscopic observations of mature embryo sacs observations in ZH8015 and F₁ plants.
44 (A) The normal embryo sac at maturity. (B) The degenerated embryo sac at maturity. (C) Statistical analysis of
45 normal mature embryo sac formation in ZH8015 and F₁ plants. A, antipodal cell; P, polar nucleus; E, egg cell; S,
46 synergid cell. Scale bars represent 50 μm. (Ovule number: ZH8015: 169; F₁: 179).
47



49 Supplementary Fig. S6. In vitro pollen germination assay. (A, B) Germination of WT and *des1* pollen grains *in*50 *vitro*. Scale bars represent 10 μm. (C) Percentage of WT and *des1* pollen grain germination *in vitro*. Data are
51 means ± SD (n = 3). Arrows indicate the pollen grains that do not germinate *in vitro*.



54 Supplementary Fig. S7. Pollen germination on the stigma and pollen tube growth in WT and *des1*. (A, B) Aniline
55 blue staining of pollen germination on the stigma at 2 h after pollination in WT (A) and *des1* (B). (C, D) Aniline
56 blue staining of pollen tube growth in the ovule at 2 h after pollination in WT (C) and *des1* (D). Scale bars

57 represent 100 μm.



58

Supplementary Fig. S8. Male gametogenesis in WT and *des1* shown by aceto-carmine and DAPI staining. (A-N)
The process of microspore development in WT (A-G) and *des1* (H-N) shown by aceto-carmine staining. (O, P)
The process of microspore development in WT (O) and *des1* (P) shown by DAPI staining. Arrows indicate the
aborted microspores. (A, H) The pollen mother cell differentiation stage; (B, I) the dyad stage; (C, J) the tetrad
stage; (D, K) the early microspore stage; (E, L) the uninucleate stage; (F, M) the bicellular stage; (G, N) the mature
pollen stage; (O, P) the tricellular stage. S, sperm nuclei; V, vegetative nuclei. Scale bars represent 10 µm in (A-P).





Supplementary Fig. S9. Transverse section observations of WT and *des1* anthers at various developmental stages.
Transverse section of WT (A-D), (I-L) and *des1* (E-H), (M-P) anthers. The transverse sections (A-P) were stained
with 0.25% toluidine blue. (A, E) Microspore mother cell stage; (B, F) the PMC pre-meiosis stage; (C, G) the dyad
stage; (D, H) the tetrad stage; (I, M) the early microspore stage; (J, N) the vacuolated microspore stage; (K, O) the
bicellular pollen stage; (L, P) the mature pollen stage. MMC, microspore mother cell; PMC, pollen mother cell; T,
tapetum; ML, middle layer; En, endothecium; E, epidermis; MC, meiotic cell; Dy, dyad cell; Tds, tetrads; Msp,
microspore parietal cell; Bp, bicellular pollen; Mp, mature pollen. Scale bars represent 25 µm in A-P.



73

Supplementary Fig. S10. Transmission electron microscopy (TEM) observations of mature anthers in WT and
 des1. Comparisons of TEM observations in the mature WT (A-C) and *des1* (D-F) pollen (A, D), pollen wall (B, E),

- 76 and tapetum (C, F). St, Starch granules; Fl, Foot layer; Ba, Baculum; Te, Tectum; Ub, Ubisch body; T, tapetum.
- 77 Scale bars represent 5 μm in (A, D), and 1 μm in (B, C, E, F).



78

79 Supplementary Fig. S11. The anthers and pollen grains of WT, *des1*, and *OsDES1*-over-expression plants. (A, B)

- 80 Comparison of the spikelets (A) and anthers (B) in WT, *des1*, and OE-1 plants. The palea and lemma were
- 81 removed for observation. (C-E) I₂-KI staining of pollen grains in WT, *des1*, and OE-1. (F) Statistical analysis of
- 82 pollen viability in WT, des1, and OE-1 plants. (G, H) Relative gene expression analysis in WT, des1, and
- 83 over-expression plants. Data are means \pm SD (n = 3). Different letters indicate significant differences as
- determined by Duncan's test (P < 0.05). Scale bars represent 0.25 cm in (A), 0.125 cm in (B), and 25 μ m in (C-E).







- 89 Scale bar represents 1.25 mm. (C) Pistils of NIP and *ko-3*. Scale bar represents 1.25 mm. (D, E) I₂-KI staining of
- 90 pollen grains from NIP and *ko-3* plants. Scale bars represent 25 μ m. (F) Statistical analysis of the percentage of 91 viable pollen in NIP and *ko-3* plants. Data are means \pm SD (*n* = 3).
- 92



94 Supplementary Fig. S13. Subcellular localization of the △OsDES1-GFP and NEMP-GFP fusion proteins. A.
95 Subcellular localization of the △OsDES1-GFP in *N. benthamiana* leaf epidermal cells and rice protoplasts.
96 △OsDES1 represents the mutant OsDES1 protein. B. Subcellular localization of the NEMP-GFP in *N. benthamiana* leaf epidermal cells and rice protoplasts. Nuclear envelop membrane protein (NEMP) domain was
98 located at amino acid residues 157-403. The Ghd7-CFP fusion protein was used as the nuclear marker. The plasma
99 membrane was stained with FM4-64. Scale bars represent 50 µm and 5 µm.



Supplementary Fig. S14. *In situ* analysis of *OsDES1* expression in longitudinal sections of the embryo sacs. (A)
 Megasporocyte stage. (B) Tetrad. (C) Functional megaspore formation stage. (D) Mature embryo sac stage. (E)
 Negative controls with the sense probe of the embryo sac at maturity. MMC, megaspore mother cell; Te, Tetrad;
 FM, functional megaspore; A, antipodal cell; S, synergid cell; E, egg cell. Scale bar represents 100 µm.



Supplementary Fig. S15. Cytokinin determination and cytokinin-related genes expression. (A) Statistical analysis of cytokinin contents. (B) and (C) *LOG* expression levels of the pistils of WT and *des1* at maturity. The *UBQ* and *Actin* gene were used as the inter controls, respectively. (D-G) Relative expression levels of cytokinin signal transduction-related genes between the pistils of WT and *des1* at maturity. The *UBQ* and *Actin* gene were used as the inter controls, respectively. Data are the means \pm SD of three independent biological replicates. Asterisks indicate a significant difference by Student's *t*-test (* *P* < 0.05, ** *P* < 0.01).

112 Supplementary tables



in WT and *des1*.

105

Line	WT	des1
Total	44	51
Ovules with pollen tube	37	41
Percent	84%	80%

115 Observation of pollen tube growth was defined as when at least one pollen tube in the ovule reached the micropyle

116 at 2 h.

117 Supplementary Table S2. Oligonucleotide primers used in this study.

Primer	Primer sequences (5'-3')	Purpose
3-24-F	GCAACCCTTTCTTCCTCCTC	T ine
3-24-R	CCAAGGAGAGCGCACTAGC	Fine mapping

X55-F	AAGATTGAAGAAGCGGTCAAGC	
X55-R	GCTTGCATGCATAGATTTCTCC	
H2-F	CCTTGCTTCCCACCTTGA	
H2-R	TTGGTATTGCCGTTGCTT	
H35-F	CGAATAGGAACCGAGACT	
H35-R	TAAGGACGTGGGAGAGAG	
H58-F	ACCACCATACAGCACAGC	
H58-R	CATCACAAGTAGCAAGCC	
H30-F	CTGCCCTGGATACGTTAT	
H30-R	CCCTCGTGCTACTTTGAC	
3-31-F	ACTAGAGCACCCTCGCTGAG	
3-31-R	CTCAGCCACCCCATCAAC	
OsDES1-SeqF	AGGTGTATTCCTTCTCGTAAGTGTGA	
OsDES1-SeqR	GGATCATAACTGCAGAAATAATCAAG	Sequencing for mutation site
OsDES1GBD-1F	TTCTGCACTAGGTACCTGCAGATGCCACCACTCCACCGCCG	0
OsDES1GBD-1R	TCTTAGAATTCCCGGGGATCCTTAAAACAGTCCGAACAAACGTTTC	Overexpression
1132-OsDES1-F	TCCCCCGGGCTGCAGGAATTCATGCCACCACTCCACCGC	
1132-OsDES1-R	GGTACCGGGCCCCCCTCGAGAAACAGTCCGAACAAACGTTTCC	
1132-△OsDES1-F	TCCCCCGGGCTGCAGGAATTCATGCCACCACTCCACCGC	
1132-△OsDES1-R	GGTACCGGGCCCCCCTCGAGGGCTCCAGCTAAGATCACACTTAC	Subcellular localization
1132NEMPGFP-F	TCCCCCGGGCTGCAGGAATTCGGAGGAAGAGTTCTTGCTTCACA	
1132NEMPGFP-R	GGTACCGGGCCCCCCTCGAGTTGAGACAATGTCTTCCTTGACCG	
LOG-AD-F	GTTCCAGATTACGCTGGATCCATGGCAATGGAGGCTGCG	
LOG-AD-R	TTGATACCACTGCTTGGATCCTCAGGATGAGGTGATCCTGGTC	¥ 1.1.1
OsDES1-BD-F	CAAAATATCTGCAATGGCCATTACGGCCATGCCACCACTCCACCGC	reast two hybrid
OsDES1-BD-R	CGAATTCCTGCAGATGGCCGAGGCGGCCCCAAACAGTCCGAACAAACGTTTC	
GFP-OsDES1-F	GATGAACTATACAAAGGCGCGCCAATGCCACCACTCCACCGC	
GFP-OsDES1-R	CGATCGGGGAAATTCGAGCTCTTAAAACAGTCCGAACAAACGTTTCC	Co ID
Myc-LOG-F	AGAGGACTTGAATTCGGTACCCATGGCAATGGAGGCTGCG	C0-IF
Myc-LOG-R	GTCCTAGGCTACGTAGGATCCTCAGGATGAGGTGATCCTGGTC	
nLUC-OsDES1-F	GAGCTCGGTACCCGGGGATCCATGCCACCACTCCACCGC	
nLUC-OsDES1-R	GCGTACGAGATCTGGTCGACAAACAGTCCGAACAAACGTTTCC	Luciferase complementation
cLUC-LOG-F	GGGGCGGTACCCGGGGATCCATGGCAATGGAGGCTGCG	imaging assay
cLUC-LOG-R	CGAAAGCTCTGCAGGTCGACTCAGGATGAGGTGATCCTGGTC	
GUS-1F	CAGTGAATTCGATAATAATTCGGCCCAGGC	CUS
GUS-1R	CGATCCATGGCGCGGCGGCGATTGAGGGAT	003
OsDES1-ZF	AGCTATGAAACAACTGGTCTCA	
OsDES1-ZR	CAGCTTAAAACAGTCCGAACAA	
LOG-F:	TCCTAGGCAGCTATAGTAGTAGG	
LOG-R:	TGTAAGATTGTTGTTCCGTTCG	qRT-PCR
OsHK1-F	GATGTACTTGATCGGGCTAAGA	
OsHK1-R	ATCACATCATCCATGAGAGACC	
OsHK2-F	CATTTGAGGATTTCACGGCTAG	
OsHK2-R	CTTTTGCTCAAACAACTCCCTT	

OHISSERATAGCCATCCATTICGCTTTCOHISSERCIGCIGTIACACCAAGAGATAAOHISSERCIGCIGTIACACCAAGAGATCGOHIPEGACAGGATCATCAAGAGATCGOHIPEGACAGGATCATCAAGAGATCGOHIPEGIGAAGAACACTIGCATCAGTOHIPEGIGAGGAACACTIGCATCAGGOHIPEGACAGCAACTATATGCAGCOHIPEGACAGCACCACTCATTCTCAGCOHIPEGACAGCACCACTCATTCTCAGCOHIPEGACAGCACCACTCATTCTCAGCOHIPEGACAGCACCACTGCTCTGTGTTCOHIPEGACAGCACCCCTGGCATAATCACOHIPEGACAGCACCCCTGGCAAAACGOHIPEGCCTCTCACTGCCATACCACOHIPEGCCTCTGCTGGGAAAACGORRIPEGTCATGCCTGCGGAAACGORRIPEGTACATGCTCCTGCCTACAAGGORRIPEGTACACTGTGCCTGAGTACCCCTGORRIPEGTACACTGGCACACTCTGCORRIPEGTACACTGGCACACTCTGCORRIPEGTACACTGGCACGTCCAGGORRIPEGTACCCCTGCTGCAGAGACCCCGGORRIPEGTGCTGTGCACAGTCCCAGGORRIPEGGTGCCTGCTCCAGGAGACCACAGGTGORRIPEGGTGCTGTGCACGCCCAGGORRIPEGGCGCGTTGCACCCAGGGORRIPEGGCGCGTTGCACCAGGGORRIPEGGCGCGTTGCACCCAGGGORRIPEGGCGCGTTGCACCCAGGORRIPEGGCGCGTTGCACCCAGGORRIPEGGCGCGTTGCACCCCAGGORRIPEGGCGCGTTGCACCCCAGGORRIPEGGCGCGTTGCACCCCAGGORRIPEGGCGCGTTGCACCCCCGCAGORRIPEGGCGCGTTGCACCCCCGCAGORRIPEGGCGCGTTGCACCCCCGCAGORRIPEGGCGCCCTGGCGGCGTTCACUBQAGG	OsHK3-F	GTTTCATGGACATACAGATGCC	
OHIKHFCTGCTGTACACAAGAGAGTAAOHIKHFGACAGGATCATCAAGAGAGTGGOHIPI-FGACAGGATCATCAAGGAGGTGGOHIPI-FGACAGGATCATCAAGGAGGTGGOHIP2-FGTGAAGAACACTTGCATCAGTOHIP2-FGTGAAGAACACTTGCATCAGGOHIP2-FGACGAGATACATATATGCAAGGOHIP3-FGAGTGGGATACATATATGCAGCOHIP3-FGAGTGGGATACATATATGCAGCOHIP3-FGAAGAGGCATCATTATTGCAGCOHIP3-FGAAGAGGGCGTGTGTGOHIP3-FGAAGAGGGCGTGTGTGOHIP3-FGAAGAGGGCGTGTGTGOHIP3-FGTGATGCCTCGGGAAACGOKRI-FGTCATGCCTCGGCATAACCAOKRI-FGTCATGCCTCGGCAAACGOKRI-FGTCATGCCTGCTGTGTGTCOKRI-FGTCATGCCTGCTGCTGCAGGAACCGOKRI-FGTCATGCCTGCTGCTGCAGGCCOKRI-FGTGACAGAGGCTTGGGTAGCCOKRI-FGTGTGCACGGGTAGGCCOKRI-FGTGTGCACGTGCTGCGGGATGCOKRI-FGTGTGCACGTGCTGCGGGGTGGCOKRI-FGTGTGCACGTGCTGCGGGGTGGGOKRI-FGTGTGCACGTGCCACGGGOKRI-FGTGTGCACGTGCCAGGGOKRI-FGGCGCGTGGGGGTATGAOKRI-FGCGCCGGGGGGTATGAOKRI-FGCGCCGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG	OsHK3-R	ATAGCCATCCATTTCGCTTTTC	
OHK44RCTCTCATCAGATCGCATCCTCOHHP1-FGACAGGATCATCAACGAGCGOHHP1-RCCTTTGAGCTGATGAACGAGGGOHHP2-RGTGAAGAACACTTGCATTCAGTOHHP2-RCACCAAATCCAAAGTCTTGAGGOHHP2-RCACCAAATCCAAAGTCATCATGAGGOHHP2-RCACTGGGATACATATGCAGCOHHP4-FCACTGGGATACATATGCAGCOHHP4-FCAATGGAGCAGCTGTTCAOHHP4-FCAATGGAGCAGCTGTTCAOHHP4-FGAGATGGATCCATCGGAAGACGOHHP4-FGAGATGGATCCATGGAGAACGOHHP4-FGTCTGGAGCAGCTGTTCAOHHP4-FGTCTGGAGCAGCGTTTCAOHHP4-FGTCTGGAGCAGCGTTTCAOHHP4-FGTCTGGAGGAGCAGCGTTTCAOHHP4-FGTCTGGAGGAGCAGCGTTCACCAAGOHHP4-FGTCTGGCTGGCGAAACGOHHP4-FGTCTGGCTGGCGAGACGCOHHP4-FGTCTGGCTGGCGAGACGCOHHP4-FGTCTGGCTGCCTGCCCACAGGOHHP4-FGTCTGTGCTGGCCGCTTCCCOHHP4-FGTGTGCCCTTCCTCTGTTCTTOHHP4-FGTGTGCCACTGGCGTCCAGGOHHP4-FGTGTGCCACTGCGCGTCCATOHHP4-FGCTCCTGGCGGTACATOHHP4-FGCTCCTGGCGGTACATOHHP4-FGCTCCTGGCGGTACATOHHP4-FGCTCCTGGCGGTACATOHHP4-FGCTCCTGGCGGTACATUHQ4-FGCCCCTGGCGGTACATUHQ4-FGCCCCTGTGCCGCTCCATCAHF4-FGGCTCCCATTCCCACAGCOHF4-FGGCTCCCATTCCCACGGTACATUHQ4-FGCCCCTGGCGTACATUHQ4-FGGCTCCTGGCGCTCCATCAHF4-FGGCTCCCGATTCCCCACGAHF4-FGGCTCCCAGGTCCCTCAGAHF4-FGG	OsHK4-F	CTGCTGTACACCAAGAGAGTAA	
OsHP1-FGACAGGATCATCAACGAGATCGOsHP1-RCCTITGACCTGATGAACGTAGGOsHP2-FGTGAAGACACTTGCATTCAGTOsHP2-RCACCAAATCCAAAGTCTTGAGGOsHP3-RGACATGCATCATATTCACCOsHP4-FCAATGCATCATCATTCTCATCCOsHP4-FCAATGCATCACTGCTGTGTCAOsHP5-FGAAGAAGGCAGCTGTTCTAOsHP5-FGAAGAAGGCCTGGCATACACCOsHP5-FGAAGAATGCATCCAAAGCOsHP5-FGTCATGCTCGGAAAACGOsHP4-RCCTTGCTTGAGCTCAGCTTACOsHP5-FGTCATGCTCGGAAAACGOsHP5-FGTCATGCTCGGAAAACGOsHP5-FGTCATGCTCGCAAACCOsHP6-FCTCAAGACTCGTCCTCACAAGOsHP6-FGTCATGCTCGCTACCAAGOsHP6-FGTCATGCCTCTCCTCTGTTCTOsHR9-FAACATATCTGGTCAAGCCOsHR9-FGTGCACTGCTCCTCTCTGTTCTOsHR9-FGTGCACTGCCTCCTCTGTTCTOsHR9-FGTGCACTGCCTTCCTCTGTGTCTOsHR9-FGTGCACTGCCTCCTCCTGGGCTCCAGGOsHR9-FGTGCCCCTTCCTCTCCTGTGTCTOsHR9-FGTGCCCCTTCCTCTCCTGGGCTCCAGOsHR9-FGTGCCCCTTCCCTCACAGOsHR9-FGTGCCCCTCGCGGTACATOsHR9-FGTGCCCCCTCGCGGTACATOsHR9-FGCTCCTGCGCGTACATOsHR9-FGCTCCTGCGCGTACATOsHR9-FGCTCCTGCGCGTACATOsHR9-FGCTCCTGCGCGTACATOsHR9-FGCTCCTGCGCGTACATOsHR9-FGCTCCTGCGCGGTACATOsHR9-FGCTCCTGCGCGGTACATOsHR9-FGCTCCTGCGCGGTACATOsHR9-FGCTCCTGCGCGGTACATOsHR9-FGCTCCTGCCGCGCGTACATO	OsHK4-R	CTCTCATTCAGATCGCATCCTC	
OMPPLRCCTTTGAGCTGATGAACGTAGGOMP2-RGTGAAGAACACTTGCATTCAGTOMP2-RCACCAAATCCAAAGTCTTAGGOMP3-FAGGTGGGATACATATATGCAGCOMP3-RGACATGCACTCATTCTTCATCCOMP4-FCAATGAAAGGCAGCTGTTCTAOMP5-FGAAGAAGGATGCTCCTGTGTTCOMP5-FGAAGAATGCATGCATCATATCACOMP5-FGAAGAATGCGTCCCTGTGTCOMP5-FGAAGAATGCTCCTCGTGTTCOMP5-FGAAGAATGCTCCCTCGTGATACCOMP5-FGTCATGCTGCGGAAAACGOMP5-FGTCATGCTGCGGAAACGOMP5-FGTCATGCTGCGGAAACGOMP5-FGTCATGCTGCGGAAACGOMP5-FGTCATGCTGCGGAAACGOMP5-FGTCATGCTGCGGAAACGOMP5-FGTCATGCTGCGGAAACGOMP5-FGTCATGCTGCTGCTACCAGGOMR1-FGTCATGCTGTGCTGCTACCAGGOMR4-FGTCTGCTGCTGCTACCAGGOMR8-FGTCTGCCTGCCGTACCAGTOMR9-RAAAGAAGAGGTCTTGAGTAGCCOMR9-RGATACTGGGTAAGTCCTCAGGGATCOMR1-FGGTGCGCATCCTGCGGGATCOMR1-FGGTGCTGCAAGTACCCGGGGOMR1-FGGTGCTGCAAGCCCCAGGOMR2-FGGGAGAGAAAGACTCTGGATGCOMR2-FGCGCAGTGCACTCCCGGCATCATUBQ-FGCTCCTGTGCCGTTCATUBQ-FGCGCCATGTGACCCCCAGGActin-FGGGTCCCATCCAGCACCCCGGCAActin-FGGGTCCCATCCAGCACCCCGGCAActin-FGGGTCCCATCCGGCATCCAGActin-FGGGTCCCATCCGGCAGTCCAGCACCCGGAGActin-FGGGTCCCATCCGGCAGTCCAGCACCCGGAGActin-FGGGTCCCATCCGCATCCGGCATCCAGCACCCCGGCATCACACCACGCGCATCCAGCACCCCGAGCACCACGCG	OsHP1-F	GACAGGATCATCAACGAGATCG	
0.5HP2-FGTGAAGAACACTTGCATTCAGT0.5HP2-RCACCAAATCCAAAGTCTTGAGG0.5HP3-RGGACGGGATACATATATGCAGC0.6HP3-RGACATGCACTCATTCTTCATCC0.6HP4-FCAATGAAAGGCAGCTGTTCTA0.6HP4-FGAAGAAGGATGCTCTGTGTTC0.6HP3-RCTCTGCACTTCACTTCTGGAAGAAC0.6HP3-RCTTGAGCTCACTGCATAACAC0.6HP3-RCTTGAGCTCACTGCATAACAC0.6HP3-RCTTGAGCTCACTGCATAACAC0.6HP3-RCTTGAGCTCACTGCATAACAC0.6HP3-RCTTGTGTGCTGGGAAAACG0.6HR4-FCTCTGCTTGCAGGATCATACCTG0.6HR4-FCTCTGTGTGCTGCAGCTTAC0.6HR4-FCTCTGTGGCGGATACATACCTG0.6HR9-RAACATATCTGTGCTACCTGCTACCTGC0.6HR9-RGTGCTGCTGCTCTCTCTGTGTTT0.6HR9-RGATAACTGGGTAAGTCCTCACGTGC0.6HR9-RGATAACTGGGTAAGTCCTCACGAG0.6HR9-RGTCTGCACATGCACGTGGATTC0.6HR9-RGATAACTGGGTAAGTCCTCAGGAG0.6HR9-FGTGTGGCACTGTCACAGTGGATTC0.6HR9-FGTGTGGCACTGTCACAGGAG0.6HR9-FGTGTGGCACTGCACGGGATCCAGGAG0.6HR9-FGGTGCTGCAAGTACCCGGGAGCAC0.6HR9-FGGTGCTGCAAGTCCTCAGAGAC0.6HR9-FGGTGCTGCCATCCTCAGAGAC0.6HR9-FGGTGCTGCGTACCAGGGAGAC0.6HR9-FGGTGCTGCGTACCAG0.6HR9-FGGTGCTGCGTACCAG0.6HR9-FGGTGCTGGTGGCATCAT0.6HR9-FGGTGCTGGTGCCATCCAGAC0.6HR9-FGGTGCTGGTGCCATCCAGAGAC0.6HR9-FGGTGCTGGTGCCATCCAGAC0.6HR9-FGGTGCTGGTGGCCATCCAGAC0.6HR9-FGGTGCTGGTGCCATCCAGAC <t< td=""><td>OsHP1-R</td><td>CCTTTGAGCTGATGAACGTAGG</td><td></td></t<>	OsHP1-R	CCTTTGAGCTGATGAACGTAGG	
0.5HP2-R CACCAAAGCCATCATATAGCAGC 0.5HP3-F AGGTGGGATACATATAGCAGC 0.5HP3-F GACATGCACTCATTCTACTCC 0.5HP4-F CAATGAAAGCAGCTGTTCTA 0.5HP4-F CAATGAAAGGCAGCTGTTCTA 0.5HP4-F CAATGAAAGGCAGCTGTTCTA 0.5HP4-R CCTCTCACTTTCTGGAAGGAT 0.5HP5-F GAAGAATGAGTGCTCGGTATACC 0.5HP5-R CTTGAGCTCACTGGAAAACG 0.5RR1-F GTCATGTCGTCGGAAAACG 0.5RR4-F CTCTGAGCAGGATCATACCCTG 0.5RR4-F CTCTGAGCAGGATCATACCCTG 0.5RR4-F CTCTTGAGCAGGATCTGGCTAGCCTGG 0.5RR9-F AAAGAAGAGGTCTTGAGTAGCC 0.5RR9-F CACTATCTGGCAACTCCTGGGATTC 0.5RR10-F GTGCTCTGCACTTCTCTCTGTTCTT 0.5RR10-F GTGCTTGCAACTCTCCACAG 0.5RR10-F GTGCTCTGCAACTCCTCAGGATC 0.5RR10-F GTCTTGCAACTTCTCCACACT 0.5RR10-F GTCTTGCAACTGCTCCAGGA 0.5RR10-F GGTCCTGGGGGATACAT 0.5RR10-F GCTCCTGGGGGGATCAT 0.5RR10-F GCTCCTGGGGGGATCAT 0.5RR10-F GCTCCTGGGGGGATCAT 0.5RR20-F GCGGCAGTGGACAAAGACTGGTGAGA <td< td=""><td>OsHP2-F</td><td>GTGAAGAACACTTGCATTCAGT</td><td></td></td<>	OsHP2-F	GTGAAGAACACTTGCATTCAGT	
OMPP-FAGGTGGGATACATATATGGAGCOMPP-RGACATGCACTCATTCTACTCOMPP-RCAATGAAAGGAGCTGTTCTAOMPP-RCCTCTTCACTTTCTGGAAGGATOMPP-RGAGAAGGATGCTCTGTGTCOMPP-RGTCATGGCTGCGGAAAACGOMPP-RGTCATGGCTGCGGAAAACGOMRRI-FGTCATGTCGTCGGAAAACGOMRRI-FCCTTGAGCAGACTCACTGGCTACCAAGOMRRI-FCTCTAGAGAGGCTTTACOMRRI-FGTCATGTGTCGCGAGATACCCTGOMRRI-FGTCATGTGTCGCGAGACACCTGOMRRI-FGTGAGCCCTTCCTCTGTTCTOMRRI-FGTGAGCCCTTCCTCTGTTCTOMRRI-FGTGCTGGCGGGATCAAGCCCTGGOMRRI-FGTGCTCGCGGTGAGGCCOMRRI-FGTGCTCTCCTCCTCTGTTCTTOMRRI-FGTGCTCGCGGGAACGCCCAGGOMRRI-FGTGCTCTGCAACTTCCCAACACOMRRI-FGTGCTCTGGCAACTCCTCAGGGATCOMRRI-FGGTCCTGGGGGATCATOMRRI-FGGTCCTGGGGGATCATOMRRI-FGGTCCTGGGGGATCATOMRRI-FGGTCCTGGGGGGATCATOMRRI-FGGTCCTGGGGGGATCATOMRRI-FGGCCCCGGGGGGATCATOMRRI-FGGCCCCGGGGGGTATCATOMRRI-FGGCCCCGGGGGGATCATOMRRI-FGGCCCCGGGGGATCATOMRRI-FGGCCCCGGGGGCATCAGOMRRI-FGGCCCCGGGGGATCATOMRRI-FGGCCCCGGGGGATCATOMRRI-FGGCCCCGGGGGATCATOMRRI-FGGCCCCGGGGGATCATOMRRI-FGGCCCCGGGGGGATCATOMRRI-FGGGCCCCGGGCATCCAGAMRAAAGAGAGGCCCCCGGCAAMRAGGGCCCCGATTCCGCCAGCAMIN-FGGGCCCCGATTCCCGGC	OsHP2-R	CACCAAATCCAAAGTCTTGAGG	
OMPPARGACATGCACTCATTCTTCATCCOMPPAFCAATGAAAGGCAGCTGTTCTAOMPPAFCCTCTTCACTTTCTGGAAGGATOMPPARCCTCTCACTTCACTGCTGGTCOMPPARCTTGAGCTCACTGCATAATCACOMRFAFGTCATGCTGCGGAAAAGGOMRFAFCTCTGCTTTGAAGAGGCTTTACOMRFAFCTCTGAGCAGACTGTCCTACCAAGOMRFAFCTCTGAGCAGACTGTCCTACCAAGOMRFAFCTCTGTGGGGAGAGCCOMRFAFGTCATGTGGTGGGAGCCOMRFAFGTAGCCTCTTCCTTGGTTGCOMRFARGAGAGAGGTCTTGAGTAGCCOMRFARCGTGGCGTTGACGTGGGATCOMRFARGATAACTGGGTAAGCCOMRFARGTTCTTGCAACTTCCACAGOMRFARGTTCTTGCAACTTCCAGGATCOMRRIAFGTTCTTGCAACTGTCAGGGATCOMRRIAFGTTCTTGCAACTTCTCACAGGOMRRIAFGGGCCCTGGGGTATCATUNOFGCGCAGTTGACGCGCGTATCATUNOFGCTCCTGTGCGGTATCATUNOFGGCCCTGTGCCGTACCAGAtin-FTGCTATGTACGCGCGCGTATCATINODESI-FGGGTCCCGGATGCAGAGAINDUSESI-KAGACTGCCTAGAGGGGGCGINDUSESI-KAGACTGCCTAGAGGGGGCG	OsHP3-F	AGGTGGGATACATATATGCAGC	
OdiPP4FCAATGAAAGGCAGCTGTTCTAOdiPP4RCCTCTTCACTTTCTGGAAGGATOdiPP5FGAAGAATGAGTGCTCTGTGTTCOdiPP5RCTTGAGCTCACTGCATAATCACOdiRP5RGTCATGCTGCGGAAAACGOkR14CCTTGCTTTGAAGAGGCTTTACOkR814CCTTGCTTGCAGCAGATCATACCAGOkR847CTCTGAGCAGATCATACCTGOkR848CTCTTGAGCAGATCATACCTGOkR847GTCATGTGTGTGGTGAGCTTGCOkR848CTCTTGAGCAGATCATACCTGOkR847GTAGCTCTTCCTGTGTCTOkR848GTAGCTCTTCCTGTGTCTTOkR848GATAACTAGTGGTAGCCOkR8497GATAACTGGGTAGCCCOkR8498GATAACTGGGTAGCCCAGGOkR8498GTCTTGCAAGTCCAGGGOkR8498GTCTGTGCAAGTCCAGGGOkR8498GTCTGTGCAAGTCCAGGGGOkR8498GTCTGTGCAAGTCCAGGGGOkR8498GCTCCGGGGGTACATUBQFGGCCCGTGGCGGTACATUBQFGGCCCTGTGCCGCCATCAGAtin-FGGCTCCTGATGCCCCTCGGAGAtin-FGGGTCCTGATTCCGGATGMODES1-FGGGTCCCGGTAGGAGGMDODES1-RAGACTGCCTAGAGAGGTGTGGCG	OsHP3-R	GACATGCACTCATTCTTCATCC	
OklP4-RCCTCTTCACTTTCTGGAAGGATOklP4-FGAAGAATGAGTGCTCTGTGTTCOklP5-FGAAGAATGAGTGCTCTGGTACACOkR1-FGTCATGTCGTCGGAAAAGGOkR1-RCCTTGCTTGAAGAGGCTTACOkR4-FCTCTAGAGACTCGTCCTACCAAGOkR4-FCTCTTGAGCAGATCATACCCTGOkR9-FAACATATCTGTGCTAGCTAGCOkR9-FAACATATCTGTGCTAGTAGCCOkR8-RGTAGCCTCTTCCTTGTTTTOkR8-RGATACTGGTGAGATCCOkR8-FCGTTGACATGTACAGTGGATCOkR8-FGATACTGGGTAAGTCCTCAGGOkR8-FGGTGCTCTTGAGTAGCCOkR8-FGGTGCTCTGCAACTTCCAACGTGOkR8-FGGTGCTCGTGAGGTGGATCOkR8-FGGTGCTCGTGAGGTGGATCAOkR8-FGGGAGAGAAAGACTGTGATGAOkR8-FGGTCCTGGGGGGTACATOkR8-FGGTCCTGGGGGGTACATOkR8-FGGTCATGTACAGCCCTAGOkR8-FGGGTCATGTACCACCCTGGCAOkR8-FGGGTCCTGGTGACATCCAGOkR8-FGGGTCCTGGTACATOkR8-FGGGTCCTCGATTCCGCATCAGOkR8-FGGGTCCTCGATTCCGGATGOkR8-FGGGTCCTCGATTCCGGATGActin-FGGGTCCTCGATTCCGGATGActin-FGGGTCCTCGATTCCGGATGActin-FGGGTCCTCGATTCCGGATGActin-FGGGTCCTCGATTCCGGATGActin-FGGGTCCTCGATTCCGGATGActin-FGGGTCCTCGATTCCGGATGActin-FGGGTCCTCGATTCCGGATGActin-FGGGTCCTCGATTCCGGATGActin-FGGGTCCTCGATTCCGGATGActin-FGGGTCCTCGATTCCGGATGActin-FGACTCCGCATACGAGGTCCTCGTCAActin-F	OsHP4-F	CAATTGAAAGGCAGCTGTTCTA	
OAHP5-FGAAGAATGAGTGCTCTGTGTTCOsHP5-RCTTGAGCTCACTGCATAATCACOsR1-FGTCATGTCGTCGGAAAACGOsR4-FCCTGCGTTGAAGAGGCTTTACOsR8-RCTCTGAGAACTCGTCCTACCAAGOsR8-RCTCTGAGCAGATCATACCCTGOsR8-RAACATATCTGTGCTAGCTAGCAOsR8-RGTAGCCTCTTCGTTGTTOsR8-RGAGACAGGTCTTGAGTAGCCOsR8-RGAGACACTGGTCACAGGGATCOsR8-RGATAACTGGGTAGTCCTCAGGOsR8-RGATAACTGGGTAGTCCTCAGGOsR81-FCGTTGCACTTCCTCTGTGTCTOsR81-FGGTGCTCTGACATGTGAGTAGCCOsR81-FGTCTTGCAACTTCCAACGTGOsR81-FGGTGCTCGTGAGCTGGATGOsR81-FGGTCTTGCAACTTCCTAACACTOsR81-FGGGAGAGACAAAGACTGTGATGAOsR81-FGGGTCCTGGACGGTACATUBQ-FGGGCAGTGACAAGGCCTAGVBQ-FGGCTCTGTACAGCCCTAGActin-FTGCTATGTACGCGCATCCAGActin-FGGGTCCTCGATTCCGGAGGNATGAGTAACCACCGCTCGTCATACCGAATTCCCCATCCGGAGNADDESI-FGGGTCCTCGATTCCGGAGGNADDESI-FAGACTCCCTAAGAGTGTGCGC	OsHP4-R	CCTCTTCACTTTCTGGAAGGAT	
bMP5-RCTTGAGCTCACTGCATAATCACbMR1-FGTCATGTCGTCGGAAAACGbMR1-RCCTTGCTTGAAGAGGCTTACbMR4-FCTCAAGAACTCGTCCTACCAAGbMR4-RCTCTTGAGCAGATCATACCCTGbMR9-FAACATATCTGTGCTAGCTTGCbMR9-FAACATATCTGTGCTAGCTTGCbMR9-FGTAGCCTCTTCGTGTTGTbKR10-FGTAGCCTCTTCGTGTGTGbKR10-FGTAGCTCTTGAGCAGATCbKR10-FGTTCTGCAATGTAGGGATCbKR10-FGTTCTGCAATGTAGGGATCbKR10-FGTTCTTGCAACTTCTAGGAGbKR10-FGGTCTTGCAACTTCTAGGAGbKR10-FGGTCTTGCAACTTCTAACACAbKR10-FGGTCTCTGTGATAGTCCTAGGbKR10-FGGTCTCTGCAACTTCTAACACAbKR20-FGGAGAGACAAAGACTGTGATGAbKR20-FGCTCCGTGCGCGTATCATbKR20-FGCGCAGTTGACAGCCCTAGbKR20-FGGGCAGTGACACCCCCTAGbKR20-FGGGCAGTGACACCCCCTAGbKR20-FGGGCAGTGACACCCCCTAGbKR20-FGGGCAGTGACACCCCCTAGbKR20-FGGGCAGTGACACCCCCTAGbKR20-FGGGCCCTGGCGGTATCATbK0-FGGGCCCTGGCGGTATCATbK0-FGGGTCTCGATTCCCGATGbK10-FGGGTCTCGATTCCGGATGbK10-FGGGTCTCGATTCCGGATGbK10-FGGGTCTCGATTCCGGATGbK10-FGGGTCTCGATTCCGGATGbK10-FGGGTCTCGATTCCGGATGbK10-FGGGTCTCGATTCCGGATGbK10-FGGGTCTCGATTCCGGATGbK10-FGGGTCCCGATTCCGATGbK10-FGGGTCCCGATTCCGATGbK10-FGGGTCCCGATTCCGATGbK10-FGGGTCCCGATTCCGATG	OsHP5-F	GAAGAATGAGTGCTCTGTGTTC	
ORR1-FGTCATGTCGTCGGAAAAGGOKR1-RCCTTGCTTGAAGAGGCTTTACOKR4-FCTCAAGAACTCGTCCTACCAAGOKR4-RCTCTTGAGCAGATCATACCCTGOKR9-FAACATATCTGTGCTAGCTAGCCOKR10FGTAGCTCTTCCTTCGTTCTTOKR10FGTAGCTCTTCCTTCGTGTCTTOKR10-RGATAACTGGGTAAGTCCOKR10-RGATAACTGGGTAAGTCCOKR10-RGATAACTGGGTAAGTCCTAGGOKR10-FGTTCTTGCAACTGTCAAGTGGATCOKR10-FGTTCTTGCAACTGGTAAGTCCTAGGOKR10-FGGTCCTGCTTAAGAAGCAGTGGATCOKR10-FGGTCCTGCGTAAGTCCTAAGGOKR10-FGGTCCTGCGGGTATCATOKR20-FGGGAGACAAAGACTGTGATGAUBQ-FGGCCCGTGGCGGTATCATUBQ-RCGGCAGTTGACGCCCTAGActin-FTGCTATGTACGTCGCCATCCAGActin-FGGGTCCTCGATTCCGGATGINODES1-FGGGTCCTCAAGAGGTGTGCGINODES1-RAGACTCGCTAAGAGTGTGGCG	OsHP5-R	CTTGAGCTCACTGCATAATCAC	
ORR1-RCCTTGCTTTGAAGAGGCTTTACOKR4-FCTCAAGAACTCGTCCTACCAAGOKR4-RCTCTTGAGCAGATCATACCCTGOKR9-FAACATATCTGTGCTAGCTTGCOKR9-RAAAGAAGAGGTCTTGAGTAGCCOKR10-FGTAGCCTCTTCCTTCTGTTCTTOKR10-RCGTTGACATGTACAGTGGATCCOKR10-RGATAACTGGGTAAGTCCCAGGOKR10-RGATAACTGGGTAAGTCCCAGGOKR10-RGATAACTGGGTAAGTCCTAGGOKR10-RGATAACTGGGTAAGTCCCAGGOKR10-RGTTCTTGCAACTTCCAACCATOKR10-RGTTCTTGCAACTTCCAACCATOKR20-FGGGAGAGACAAAGACTGTGATGAOKR20-FGGGCAGTTGACAGCCCTAGUBQ-FCGGCCGTGGCGGTATCATUBQ-RCGGCAGTTGACAGCCCTAGActin-FTGCTXTGTACTGCCATCCAGActin-RAATGAGTAACCACGCTCCGTCAIDOJES1-RGACTCCCTAGAGTGTCGCATIDOJES1-RACMAGACTCCCTAAGAGTGTGCGC	OsRR1-F	GTCATGTCGTCGGAAAACG	
ORR4-F CTCAAGAACTCGTCCTACCAAG OxR8-F CTCTTGAGCAGATCATACCCTG OxR8-F AACATATCTGTGCTAGCTTTGC OxR8-P AAAGAAGAGGTCTTGAGTAGCC OxR8-P.R AAAGAAGAGGTCTTGAGTAGCC OxR810-F GTAGCCTCTTCCTTCTGTTCTT OxR81-F CGTTGACATGTACAGTGGATCC OxR81-F CGTTGACATGTACAGTGGATTC OxR81-F CGTTGACATGTACAGTGGATTC OxR81-F GTTCTTGCAACTCTCAACCAT OxR81-F GTTCTTGCAACTCTCAACCAGTG OxR81-F GTTCTTGCAACTCTCCAACAGTG OxR820-F GGAGAGACAAAGACTGTGATGA OxR820-F GGGCAGTTGACAGCCCTAAG UBQ-F CGGCAGTTGACGTCCCATAG UBQ-R CGGCAGTTGACGTCCCATGG Actin-F TGCTATGTACGTCGCCATCCAG Actin-F GGGTCCTGATTTCCGGATG NDADES1-F GGGTCCTGATTTCCGGATG NDADES1-R AGACTCGCTAAGAGTGTGCG	OsRR1-R	CCTTGCTTTGAAGAGGCTTTAC	
ORR4-RCTCTTGAGCAGATCATACCCTGOsR9-FAACATATCTGTGCTAGCTTGCOsR9-RAAAGAAGAGGTCTTGAGTAGCCOsR10-FGTAGCCTCTTCCTTGTTCTTOsR10-RAAAGAAGAGGGTCTTGAGTAGCCOsR16-FCGTTGACATGTACAGTGGATTCOsR16-RGATAACTGGGTAAGTCCTCAGGOsR19-RGTTCTTGCAACTTCTAAGAAOsR819-RGTTCTTGCAACTGGATAGCOsR819-RGTTCTTGCAACTTCTCAACATOsR819-RGTCCTGTGCTAAGAACCAGGTGOsR820-FGGAGAGACAAAAGACTGTGATGAUBQ-FGCTCCGTGGCGGTATCATUBQ-RCGGCAGTTGACAGCCCTAGActin-FTGCTATGTACGTCCCATCCAGActin-RAATGAGTAACCACGCTCGTCAInOSDES1-FGGGTCCTCGATTCCGCAAGGNA in silu hybridization	OsRR4-F	CTCAAGAACTCGTCCTACCAAG	
ORR9-FAACATATCTGTGCTAGCTTTGCOsRR9-RAAAGAAGAGGTCTTGAGTAGCCOsRR10-FGTAGCCTCTTCCTTCTGTTCTTOsRR10-RAAAGAAGAGGTCTTGAGTAGCCOsRR16-FCGTTGACATGTACAGTGGATTCOsRR19-FGTTCTTGCAACTCTCAACCATOsRR19-FGTTCTTGCAACTTCTAACAACOsRR19-RTCTGTCTTAAGAACACCAGGTGOsRR20-RGGAGAGACAAAGACTGTGATGAUBQ-FGCTCCGTGGCGGTATCATUBQ-RCGGCAGTTGACAGCCCTAGActin-FTGCTATGTACGCCCATCCAGActin-RAATGAGTAACCACGCTCGTCAInosDES1-FGGGTCCTCGATTCCGGATGInosDES1-RAGACTCCCTAAGAAGTGTGCG	OsRR4-R	CTCTTGAGCAGATCATACCCTG	
ORR9-RAAAGAAGAGGTCTTGAGTAGCCOsRR10-FGTAGCCTCTTCCTTCTGTTCTTOsRR10-RAAAGAAGAGGTCTTGAGTAGCCOsRR16-FCGTTGACATGTACAGTGGATTCOsRR16-RGATAACTGGGTAAGTCCTCAGGOsRR19-FGTTCTTGCAACTTCTCAACCATOsRR20-FGGGAGAGACAAAGACTGTGATGAUBQ-FGCTCCGTGGCGGTATCATUBQ-RCGGCAGTTGACAGCCCTAGActin-FTGCTATGTACGTCGCCATCCAGActin-RAATGAGTAACCACGCTCCGTCAInosDES1-FGGGTCCTCGATTTCCGGATGINOSDES1-RAGACTCGCTAAGAGTGTGCG	OsRR9-F	AACATATCTGTGCTAGCTTTGC	
OsRR10-FGTAGCCTCTTCCTTCTGTTCTTOsRR10-RAAAGAAGAGGTCTTGAGTAGCCOsRR16-FCGTTGACATGTACAGTGGATTCOsRR16-RGATAACTGGGTAAGTCCTCAGGOsRR19-FGTTCTTGCAACTTCTCAACCATOsRR20-FGGAGAGACAAAGACTGTGATGAUBQ-FGCTCCGTGGCGGTATCATUBQ-RCGGCAGTTGACAGCCCTAGActin-FTGCTATGTACGCCATCCGTCAInosDES1-FGGGTCCTCGATTCCGGATGInosDES1-RAGACTCGCTAGGAGTGTGCCA	OsRR9-R	AAAGAAGAGGTCTTGAGTAGCC	
OsRR10-RAAAGAAGAGGTCTTGAGTAGCCOsRR16-FCGTTGACATGTACAGTGGATTCOsRR16-RGATAACTGGGTAAGTCCTCAGGOsRR19-FGTTCTTGCAACTTCTCAACCATOsRR19-RTCTGTCTTAAGAACACCAGGTGOsR20-FGGAGAGACAAAGACTGTGATGAUBQ-FGCTCCGTGGCGGTATCATUBQ-FCGGCAGTTGACGCCCTAGActin-FTGCTATGTACGTCGCCATCCAGActin-FGGGTCCTCGATTTCCGGATGIDSDES1-FGGGTCCTCGATTTCCGGATGNDADES1-RAGACTCGCTAGAGGTGTGCG	OsRR10-F	GTAGCCTCTTCCTTCTGTTCTT	
OsRR 16-FCGTTGACATGTACAGTGGATTCOsRR 16-RGATAACTGGGTAAGTCCTCAGGOsRR 19-FGTTCTTGCAACTTCTCAACCATOsRR 19-RTCTGTCTTAAGAACACCAGGTGOsRR 20-FGGAGAGACAAAGACTGTGATGAUBQ-FGCTCCGTGGCGGTATCATUBQ-RCGGCAGTTGACAGCCCTAGActin-FTGCTATGTACGTCGCCATCCAGActin-RAATGAGTAACCACGCTCCGTAGIOSDES1-FGGGTCCTCGATTCCGGATGRNA <i>in sinu</i> hybridization	OsRR10-R	AAAGAAGAGGTCTTGAGTAGCC	
OsRR 16-RGATAACTGGGTAAGTCCTCAGGOsRR 19-FGTTCTTGCAACTTCTCAACCATOsRR 19-RTCTGTCTTAAGAACACCAGGTGOsRR 20-FGGAGAGACAAAGACTGTGATGAOsRR 20-RTACCGAACTTCCTCCTAACAACUBQ-FGCTCCGTGGCGGTATCATUBQ-RCGGCAGTTGACAGCCCTAGActin-FTGCTATGTACGTCGCCATCCAGActin-RAATGAGTAACCACGCTCCGTCAIDOsDES1-FGGGTCCTCGATTTCCGGATGRNA in situ hybridizationAGACTCGCTAAGAGTGGCCA	OsRR16-F	CGTTGACATGTACAGTGGATTC	
OsRR 19-F GTTCTTGCAACTTCTCAACCAT OsRR 19-R TCTGTCTTAAGAACACCAGGTG OsRR 20-F GGAGAGACAAAGACTGTGATGA OsRR 20-R TACCGAACTTCCTCCTAACAAC UBQ-F GCTCCGTGGCGGTATCAT UBQ-R CGGCAGTTGACAGCCCTAG Actin-F TGCTATGTACGTCGCCATCCAG Actin-R AATGAGTAACCACGCTCCGTCA InOsDES1-F GGGTCCTCGATTCCGGATG InOsDES1-R AGACTCGCTAAGAGTGTGCG	OsRR16-R	GATAACTGGGTAAGTCCTCAGG	
OsRR 19-R TCTGTCTTAAGAACACCAGGTG OsRR 20-F GGAGAGACAAAGACTGTGATGA OsRR 20-R TACCGAACTTCCTCCTAACAAC UBQ-F GCTCCGTGGCGGTATCAT UBQ-R CGGCAGTTGACAGCCCTAG Actin-F TGCTATGTACGTCGCCATCCAG Actin-R AATGAGTAACCACGCTCCGTCA InOsDES1-F GGGTCCTCGATTTCCGGATG RNA in situ hybridization AGACTCGCTAAGAGTGTGCC	OsRR19-F	GTTCTTGCAACTTCTCAACCAT	
OsRR20-F GGAGAGACAAAGACTGTGATGA OsRR20-R TACCGAACTTCCTCCTAACAAC UBQ-F GCTCCGTGGCGGTATCAT UBQ-R CGGCAGTTGACAGCCCTAG Actin-F TGCTATGTACGTCGCCATCCAG Actin-R AATGAGTAACCACGCTCCGTCA InOsDES1-F GGGTCCTCGATTCCGGATG InOsDES1-R AGACTCGCTAAGAGTGTGCG	OsRR19-R	TCTGTCTTAAGAACACCAGGTG	
OsRR20-R TACCGAACTTCCTCCTAACAAC UBQ-F GCTCCGTGGCGGTATCAT UBQ-R CGGCAGTTGACAGCCCTAG Actin-F TGCTATGTACGTCGCCATCCAG Actin-R AATGAGTAACCACGCTCCGTCA InOsDES1-F GGGTCCTCGATTTCCGGATG InOsDES1-R AGACTCGCTAAGAGTGTGCG	OsRR20-F	GGAGAGACAAAGACTGTGATGA	
UBQ-F GCTCCGTGGCGGTATCAT UBQ-R CGGCAGTTGACAGCCCTAG Actin-F TGCTATGTACGTCGCCATCCAG Actin-R AATGAGTAACCACGCTCCGTCA InOsDES1-F GGGTCCTCGATTTCCGGATG InOsDES1-R AGACTCGCTAAGAGTGTGCG	OsRR20-R	TACCGAACTTCCTCCTAACAAC	
UBQ-R CGGCAGTTGACAGCCCTAG Actin-F TGCTATGTACGTCGCCATCCAG Actin-R AATGAGTAACCACGCTCCGTCA InOsDES1-F GGGTCCTCGATTTCCGGATG InOsDES1-R AGACTCGCTAAGAGTGTGCG	UBQ-F	GCTCCGTGGCGGTATCAT	
Actin-F TGCTATGTACGTCGCCATCCAG Actin-R AATGAGTAACCACGCTCCGTCA InOsDES1-F GGGTCCTCGATTTCCGGATG InOsDES1-R AGACTCGCTAAGAGTGTGCG	UBQ-R	CGGCAGTTGACAGCCCTAG	
Actin-R AATGAGTAACCACGCTCCGTCA InOsDES1-F GGGTCCTCGATTTCCGGATG InOsDES1-R AGACTCGCTAAGAGTGTGCG	Actin-F	TGCTATGTACGTCGCCATCCAG	
InOsDES1-F GGGTCCTCGATTTCCGGATG RNA in situ hybridization InOsDES1-R AGACTCGCTAAGAGTGTGCG	Actin-R	AATGAGTAACCACGCTCCGTCA	
InosDES1-R AGACTCGCTAAGAGTGTGCG	InOsDES1-F	GGGTCCTCGATTTCCGGATG	RNA in situ hybridization
	InOsDES1-R	AGACTCGCTAAGAGTGTGCG	KINFY III SIUU HYDHOLZAIIOII