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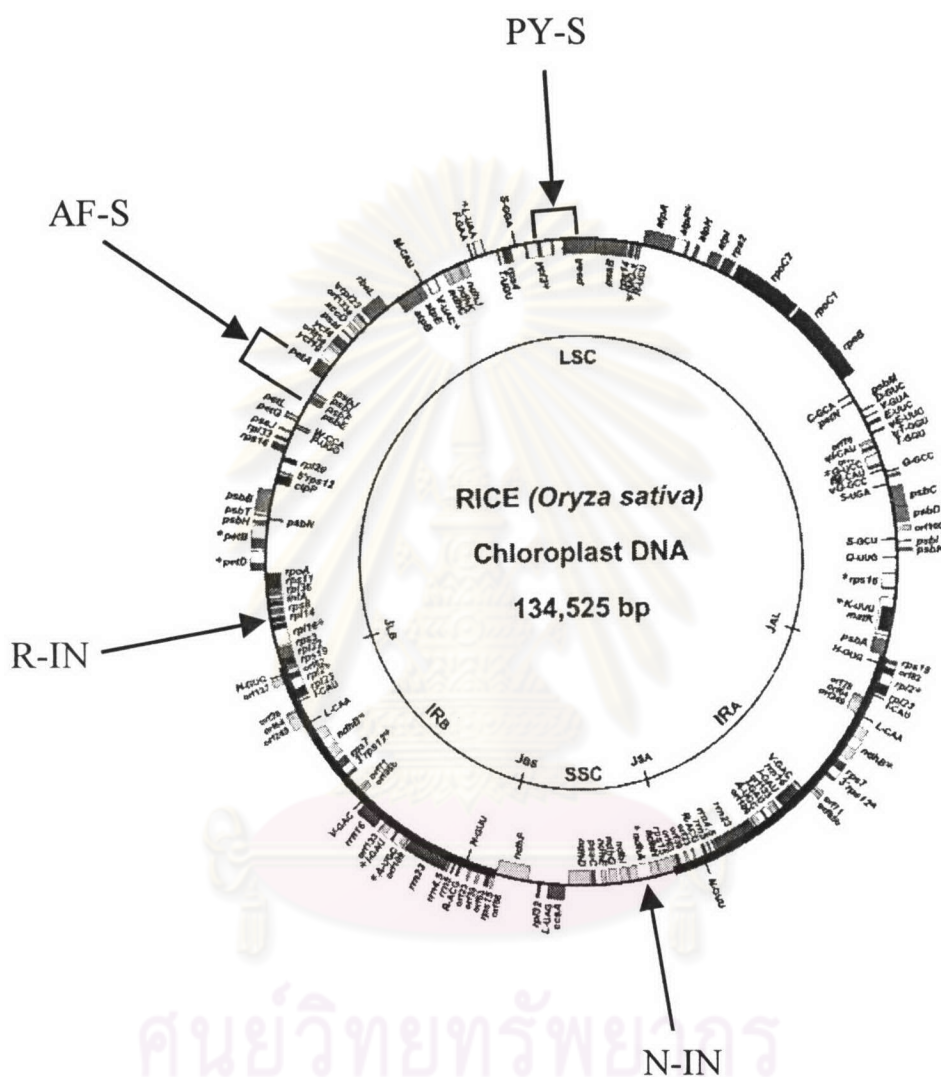
**APPENDICES**

ศูนย์วิทยทรัพยากร  
จุฬาลงกรณ์มหาวิทยาลัย



## APPENDIX A

### RICE COMPLETE CHLOROPLAST GENOME



Locations of four selected fragments for chloroplast sequence analyses in *Musa* (Chapter 3) on rice complete chloroplast genome (Tsudzuki et al. in press). The fragments indicated by arrows are (from top to bottom, counter clock-wise) PY-S = *psaA-ycf3* intergenic spacer; AF-S = *petA-psbJ-psbL-psbF* intergenic spacers; R-IN = *rpl16* intron; and N-IN = *ndhA* intron.



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TT_JCK AAAAAAAAA-T AAAAAAAAAA CCAACTTATT GCTTCGTATT GTCGAGATCC CAAGAAAACAG TCACTATATG AGATGAGTGG ATCAATCATA TAGTTGCAGC AACTGCACCT AAAATCTTTT [ 240]
TT_FAA ..... [ 240]
TT_FTL ..... [ 240]
TT_TXT ..... [ 240]
BB_NAN ..... [ 240]
BB_SKT ..... [ 240]
BB_PKW ..... [ 240]
BB_P28 ..... [ 240]
BB_CMR ..... [ 240]
BBB_LCK ..... [ 240]
BBA_PSB ..... [ 240]
BBBA_PLH ..... [ 240]
BBA_NWN ..... [ 240]
BBA_MNG ..... [ 240]
BBA_HIN ..... [ 240]
ABB_HIN ..... [ 240]
ABB_PGM ..... [ 240]
AB_AUK ..... [ 240]
AA_SAM ..... [ 240]
AA_MAL ..... [ 240]
AAA_HOM ..... [ 240]
AA_BKS ..... [ 240]

CCATAAAAAA TCTGATTATG GGTTGTGAAA CAAAAATAAA GGGATGTGGA TAAATGGAAG GATGATAGAA AGAGAGAACA AAAATATCAA TGATATATGA TTCCAATATG TATGGTCTAT [ 360]
TT_FAA ..... [ 360]
TT_FTL ..... [ 360]
TT_TXT ..... [ 360]
BB_NAN ..... [ 360]
BB_SKT ..... [ 360]
BB_PKW ..... [ 360]
BB_P28 ..... [ 360]
BB_CMR ..... [ 360]
BBB_LCK ..... [ 360]
BBA_PSB ..... [ 360]
BBBA_PLH ..... [ 360]
BBA_NWN ..... [ 360]
BBA_MNG ..... [ 360]
BBA_HIN ..... [ 360]
ABB_HIN ..... [ 360]
ABB_PGM ..... [ 360]
AB_AUK ..... [ 360]
AA_SAM ..... [ 360]
AA_MAL ..... [ 360]
AAA_HOM ..... [ 360]
AA_BKS ..... [ 360]

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TT_JCK      GAATTACCTC ATAAAGCAA TGATATAAG CATCAATACT GAATGAATAT AAATAATA-- --ATA AAGAGCCTCG GGTAAATAAA AACTAAGGAG ATTGACTCGA GAAGGAATTT [ 480]
TT_FAA      [ 480]
TT_FTL      [ 480]
TT_TXT      [ 480]
BB_NAN      [ 480]
BB_SKT      [ 480]
BB_PKW      [ 480]
BB_P28      [ 480]
BB_CMR      [ 480]
BBB_LCK     [ 480]
BBA_PSB     [ 480]
BBBA_PLH    [ 480]
BBA_NWN     [ 480]
BBA_MNG     [ 480]
BBA_HIN     [ 480]
ABB_HIN     [ 480]
ABB_PGM     [ 480]
AB_AUK      [ 480]
AA_SAM      [ 480]
AA_MAL      [ 480]
AAA_HOM     [ 480]
AA_BKS      [ 480]

TT_JCK      TGTTGGGAGC TCCATTGCAG AGTTGAGACC TAACCATTAA TGGAGAAGCT ATGGGAACCA CGGAACCTGT GACTGCATAG GATTCTACTG AAAACGATC CGAATAATTC ATTGGGTGGG [ 600]
TT_FAA      [ 600]
TT_FTL      [ 600]
TT_TXT      [ 600]
BB_NAN      [ 600]
BB_SKT      [ 600]
BB_PKW      [ 600]
BB_P28      [ 600]
BB_CMR      [ 600]
BBB_LCK     [ 600]
BBA_PSB     [ 600]
BBBA_PLH    [ 600]
BBA_NWN     [ 600]
BBA_MNG     [ 600]
BBA_HIN     [ 600]
ABB_HIN     [ 600]
ABB_PGM     [ 600]
AB_AUK      [ 600]
AA_SAM      [ 600]
AA_MAL      [ 600]
AAA_HOM     [ 600]
AA_BKS      [ 600]

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TT_JCK ATGGCGGAC GAACCGAGAA AAAATTTATT TATTCTGAGA AGTCATGGGT TGACCTAGGA ATAAACACACT AAAGAGTCAA TATTGGCCCG CGAAACCTTT ATTTATTGAG ATTACATTAC [ 720]
TT_FAA ..... [ 720]
TT_FTL ..... [ 720]
TT_TXT ..... [ 720]
BB_NAN ..... [ 720]
BB_SKT ..... [ 720]
BB_PKW ..... [ 720]
BB_P28 ..... [ 720]
BB_CMR ..... [ 720]
BBB_LCK ..... [ 720]
BBA_PSB ..... [ 720]
BBBA_PLH ..... [ 720]
BBA_NWN ..... [ 720]
BBA_MNG ..... [ 720]
BBA_HIN ..... [ 720]
ABB_HIN ..... [ 720]
ABB_PGM ..... [ 720]
AB_AUK ..... [ 720]
AA_SAM ..... [ 720]
AA_MAL ..... [ 720]
AAA_HOM ..... [ 720]
AA_BKS ..... [ 720]

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TT_JCK AATATTTTGG CATCATTTGA TAAGGTAAA AATAAGGATC AAGGATCGTT ATAAAATAAA AAGCATTATC TATAATTATA AAAAGCAITTA -----TC TATAATTTAT [ 840]
TT_FAA ..... [ 840]
TT_FTL ..... [ 840]
TT_TXT ..... [ 840]
BB_NAN ..... [ 840]
BB_SKT ..... [ 840]
BB_PKW ..... [ 840]
BB_P28 ..... [ 840]
BB_CMR ..... [ 840]
BBB_LCK ..... [ 840]
BBA_PSB ..... [ 840]
BBBA_PLH ..... [ 840]
BBA_NWN ..... [ 840]
BBA_MNG ..... [ 840]
BBA_HIN ..... [ 840]
ABB_HIN ..... [ 840]
ABB_PGM ..... [ 840]
AB_AUK ..... [ 840]
AA_SAM ..... [ 840]
AA_MAL ..... [ 840]
AAA_HOM ..... [ 840]
AA_BKS ..... [ 840]

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TT_JCK ATCTATAAAT ATGCATAACA TAAATATTCT AGCTGTATAT CCTGTATACA CATCTCCTG TATAACAANA CAAATTCAT ATCAATAAAT GTCTTAGTGT ATTAGTTTAT TAAAT----- [ 960]
TT_FAA ..... [ 960]
TT_FTL ..... [ 960]
TT_TXT ..... [ 960]
BB_NAN .....T..... [ 960]
BB_SKT .....A.....T.....TATTA [ 960]
BB_PKW .....A.....T.....TATTA [ 960]
BB_P28 .....A.....T.....TATTA [ 960]
BB_CMR .....A.....T.....TATTA [ 960]
BBB_LCK .....A.....T.....TATTA [ 960]
BBA_PSB .....A.....T.....TATTA [ 960]
BBBA_PLH .....A.....T.....TATTA [ 960]
BBA_NWN .....A.....T.....TATTA [ 960]
BBA_HIN .....A.....T.....TATTA [ 960]
ABB_HIN .....T.....T.....TATTA [ 960]
ABB_PGM .....T.....T.....TATTA [ 960]
AB_AUK .....T.....T.....TATTA [ 960]
AA_SAM .....T.....T.....TATTA [ 960]
AA_MAL .....T.....T.....TATTA [ 960]
AAA_HOM .....T.....T.....TATTA [ 960]
AA_BKS .....T.....T.....TATTA [ 960]

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TT_JCK ---ACAATGT TATCTGTAAT ATTATTGAAT CCTTTCATTC GCGAGGAGCT GGATGAGAAG AAACCTCTCAT GTCCGGTTCT GTAGTAGAGA TGGAAATTAAG AAACGACCAT CAACATAAAC [1080]
TT_FAA ..... [1080]
TT_FTL ..... [1080]
TT_TXT ..... [1080]
BB_NAN AAT...C..... [1080]
BB_SKT AAT...C..... [1080]
BB_PKW AAT...C..... [1080]
BB_P28 AAT...C..... [1080]
BB_CMR AAT...C..... [1080]
BBB_LCK AAT...C..... [1080]
BBA_PSB AAT...C..... [1080]
BBBA_PLH AAT...C..... [1080]
BBA_NWN AAT...C..... [1080]
BBA_WNG GAT...C..... [1080]
BBA_HIN AAT...C..... [1080]
ABB_HIN .....C..... [1080]
ABB_PGM .....C..... [1080]
AB_AUK .....C..... [1080]
AA_SAM .....C..... [1080]
AA_MAL .....C..... [1080]
AAA_HOM .....C..... [1080]
AA_BKS .....C..... [1080]

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TT\_JCK CCAACAGTTT TTAGTGAACC TCTGAAAGAT AGCTATTTTA TTTATGTTAT GATTAGTCCC TTTCTTTTCT ATCTCCCATC CATCTATTTT ATTAGTTAT TCACTAGAGC [1440]  
 TT\_FAA ..... [1440]  
 TT\_FTL ..... [1440]  
 TT\_TXT ..... [1440]  
 BB\_NAN ..... [1440]  
 BB\_SKT ..... [1440]  
 BB\_PKW ..... [1440]  
 BB\_P28 ..... [1440]  
 BB\_CMR ..... [1440]  
 BBB\_LCK ..... [1440]  
 BBA\_PSB ..... [1440]  
 BBBB\_PLH ..... [1440]  
 BBA\_NWN ..... [1440]  
 BBA\_MNG ..... [1440]  
 BBA\_HIN ..... [1440]  
 ABB\_HIN ..... [1440]  
 ABB\_PGM ..... [1440]  
 AB\_AUK ..... [1440]  
 AA\_SAM ..... [1440]  
 AA\_MAL ..... [1440]  
 AAA\_HOM ..... [1440]  
 AA\_BKS ..... [1440]

AATTATTAGT TATTCAC TAG AGCAATTATG ATATTGAAGT CAATCCGAGG CRAAGTGTTCG GATCTATTAT GACATAACGA TTAGGTGCC AACGGACCC TTTTCTCTTG GAAAGTCCTT [1560]  
 TT\_FAA ..... [1560]  
 TT\_FTL ..... [1560]  
 TT\_TXT ..... [1560]  
 BB\_NAN ..... [1560]  
 BB\_SKT ..... [1560]  
 BB\_PKW ..... [1560]  
 BB\_P28 ..... [1560]  
 BB\_CMR ..... [1560]  
 BBB\_LCK ..... [1560]  
 BBA\_PSB ..... [1560]  
 BBBB\_PLH ..... [1560]  
 BBA\_NWN ..... [1560]  
 BBA\_MNG ..... [1560]  
 BBA\_HIN ..... [1560]  
 ABB\_HIN ..... [1560]  
 ABB\_PGM ..... [1560]  
 AB\_AUK ..... [1560]  
 AA\_SAM ..... [1560]  
 AA\_MAL ..... [1560]  
 AAA\_HOM ..... [1560]  
 AA\_BKS ..... [1560]







TT_JCK	GCTTGTTC	AATACTCAGC	AGCTTGATCG	AACCAAGCCT	CCGCAATTC	AGAATCACCT	TGTAGAATGG	CCTGTTCTCC	TCGGGCTGCT	CAATCTATTA	GTTATGAAAT	ACCATTAAC	[2160]
TT_FAA	.....	.....	.....	.....	.....	.....	.....	.....	.....	..A.....	.....	.....	[2160]
TT_FTL	.....	.....	.....	.....	.....	.....	.....	.....	.....	..A.....	.....	.....	[2160]
TT_TXT	.....	.....	.....	.....	.....	.....	.....	.....	.....	..A.....	.....	.....	[2160]
BB_NAN	.....	.....	.....	.....	.....	.....	.....	.....	.....	..A.....	.....	.....	[2160]
BB_SKT	.....	.....	.....	.....	.....	.....	.....	.....	.....	..A.....	.....	.....	[2160]
BB_PKW	.....	.....	.....	.....	.....	.....	.....	.....	.....	..A.....	.....	.....	[2160]
BB_P28	.....	.....	.....	.....	.....	.....	.....	.....	.....	..A.....	.....	.....	[2160]
BB_CMR	.....	.....	.....	.....	.....	.....	.....	.....	.....	..A.....	.....	.....	[2160]
BBB_LCK	.....	.....	.....	.....	.....	.....	.....	.....	.....	..A.....	.....	.....	[2160]
BBB_PSB	.....	.....	.....	.....	.....	.....	.....	.....	.....	..A.....	.....	.....	[2160]
BBBA_PLH	.....	.....	.....	.....	.....	.....	.....	.....	.....	..A.....	.....	.....	[2160]
BBA_NWN	.....	.....	.....	.....	.....	.....	.....	.....	.....	..A.....	.....	.....	[2160]
BBA_MNG	.....	.....	.....	.....	.....	.....	.....	.....	.....	..A.....	.....	.....	[2160]
BBA_HIN	.....	.....	.....	.....	.....	.....	.....	.....	.....	..A.....	.....	.....	[2160]
ABB_HIN	.....	.....	.....	.....	.....	.....	.....	.....	.....	..A.....	.....	.....	[2160]
ABB_PGM	.....	.....	.....	.....	.....	.....	.....	.....	.....	..A.....	.....	.....	[2160]
AB_AUK	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	[2160]
AA_SAM	.....	.....	.....	.....	.....	.....	.....	.....	.....	..A.....	.....	.....	[2160]
AA_MAL	.....	.....	.....	.....	.....	.....	.....	.....	.....	..A.....	.....	.....	[2160]
AAA_HOM	.....	.....	.....	.....	.....	.....	.....	.....	.....	..A.....	.....	.....	[2160]
AA_BKS	.....	.....	.....	.....	.....	.....	.....	.....	.....	..A.....	.....	.....	[2160]
TT_JCK	CTATGTGT	TATCAATATC	TCTACGTGTG	ATTGGTTGAA	CATGAACCTT	ATACTTCTT	CCTAGAAGTA	AAGGAAAGAA	GTTGAATGTA	ATGATTGAA	TAGATATTT	CTTTTTATT	[2280]
TT_FAA	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	[2280]
TT_FTL	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	[2280]
TT_TXT	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	[2280]
BB_NAN	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	[2280]
BB_SKT	.....	.....	.....	.....	.....	.....	.....	.....	.....	..G.....	.....	.....	[2280]
BB_PKW	.....	.....	.....	.....	.....	.....	.....	.....	.....	..G.....	.....	.....	[2280]
BB_P28	.....	.....	.....	.....	.....	.....	.....	.....	.....	..G.....	.....	.....	[2280]
BB_CMR	.....	.....	.....	.....	.....	.....	.....	.....	.....	..G.....	.....	.....	[2280]
BBB_LCK	.....	.....	.....	.....	.....	.....	.....	.....	.....	..G.....	.....	.....	[2280]
BBA_PSB	.....	.....	.....	.....	.....	.....	.....	.....	.....	..G.....	.....	.....	[2280]
BBBA_PLH	.....	.....	.....	.....	.....	.....	.....	.....	.....	..G.....	.....	.....	[2280]
BBA_NWN	.....	.....	.....	.....	.....	.....	.....	.....	.....	..G.....	.....	.....	[2280]
BBA_MNG	.....	.....	.....	.....	.....	.....	.....	.....	.....	..G.....	.....	.....	[2280]
BBA_HIN	.....	.....	.....	.....	.....	.....	.....	.....	.....	..G.....	.....	.....	[2280]
ABB_HIN	.....	.....	.....	.....	.....	.....	.....	.....	.....	..G.....	.....	.....	[2280]
ABB_PGM	.....	.....	.....	.....	.....	.....	.....	.....	.....	..G.....	.....	.....	[2280]
AB_AUK	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	[2280]
AA_SAM	.....	.....	.....	.....	.....	.....	.....	.....	.....	..G.....	.....	.....	[2280]
AA_MAL	.....	.....	.....	.....	.....	.....	.....	.....	.....	..G.....	.....	.....	[2280]
AAA_HOM	.....	.....	.....	.....	.....	.....	.....	.....	.....	..G.....	.....	.....	[2280]
AA_BKS	.....	.....	.....	.....	.....	.....	.....	.....	.....	..G.....	.....	.....	[2280]

TT\_JCK CATCATTCGG GTCAAATGAGT TAAACCAGAT AGTTATATGA GTGAAACAAA ACAACTAGA AGTTTGCAGT AAGAAGATAA AATCTCATT CATATGTACA AGAATAAAGT TCAAGTAAAC [2400]  
 TT\_FAA ..... [2400]  
 TT\_FTL ..... [2400]  
 TT\_TXT ..... [2400]  
 BB\_NAN ..... [2400]  
 BB\_SKT ..... [2400]  
 BB\_PKW ..... [2400]  
 BB\_P28 ..... [2400]  
 BB\_CMR ..... [2400]  
 BB\_LCK ..... [2400]  
 BB\_PSB ..... [2400]  
 BBB\_PLH ..... [2400]  
 BB\_NWN ..... [2400]  
 BB\_MNG ..... [2400]  
 BB\_HIN ..... [2400]  
 ABB\_HIN ..... [2400]  
 ABB\_PGM ..... [2400]  
 AB\_AUK ..... [2400]  
 AA\_SAM ..... [2400]  
 AA\_MAL ..... [2400]  
 AAA\_HOM ..... [2400]  
 AA\_BKS ..... [2400]  
 TT\_JCK ATAAAGCAGTG TAAACTGTTT ACCCCAGAT TAAGATCTTT TCATTAGTCA TCATATCTTG AAGCGGGTGT AAAAGATCAA CTGTATGGAG TTTTCATTAC TGTCTTGTAT TTATTACCAT [2520]  
 TT\_FAA ..... [2520]  
 TT\_FTL ..... [2520]  
 TT\_TXT ..... [2520]  
 BB\_NAN ..... [2520]  
 BB\_SKT ..... [2520]  
 BB\_PKW ..... [2520]  
 BB\_P28 ..... [2520]  
 BB\_CMR ..... [2520]  
 BB\_LCK ..... [2520]  
 BB\_PSB ..... [2520]  
 BBB\_PLH ..... [2520]  
 BB\_NWN ..... [2520]  
 BB\_MNG ..... [2520]  
 BB\_HIN ..... [2520]  
 ABB\_HIN ..... [2520]  
 ABB\_PGM ..... [2520]  
 AB\_AUK ..... [2520]  
 AA\_SAM ..... [2520]  
 AA\_MAL ..... [2520]  
 AAA\_HOM ..... [2520]  
 AA\_BKS ..... [2520]

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TT_JCK      GCGGTAGATC AATAAAAAAT CAGTGGACGG TTAGGAACAC CAAAGTGAC TAATAGAGAT AATGTAAGGT ATCAAAAAAA [2640]
TT_FAA      . . . . . [2640]
TT_FTL      . . . . . [2640]
TT_TXT      . . . . . [2640]
BB_NAN      . . . . . [2640]
BB_SKT      . . . . . [2640]
BB_PKW      . . . . . [2640]
BB_P28      . . . . . [2640]
BB_CMR      . . . . . [2640]
BBB_LCK     . . . . . [2640]
BBB_PSB     . . . . . [2640]
BBB_PLB     . . . . . [2640]
BBB_PLN     . . . . . [2640]
BBB_MNG     . . . . . [2640]
BBB_HIN     . . . . . [2640]
BBB_HIN     . . . . . [2640]
ABB_PGM     . . . . . [2640]
AB_AUK      . . . . . [2640]
AA_SAM      . . . . . [2640]
AA_MAL      . . . . . [2640]
AAA_HOM     . . . . . [2640]
AA_BKS      . . . . . [2640]

TT_JCK      -----TAAA AAAATGAATA AAAATATTGA TGCATAAAAT AAA--ACGA ATCAAAATAG GGACTTTTAAG TTGGTAGAAA TAATCAAGCA GTACTTCCTC [2760]
TT_FAA      . . . . . [2760]
TT_FTL      . . . . . [2760]
TT_TXT      . . . . . [2760]
BB_NAN      . . . . . [2760]
BB_SKT      . . . . . [2760]
BB_PKW      . . . . . [2760]
BB_P28      . . . . . [2760]
BB_CMR      . . . . . [2760]
BBB_LCK     . . . . . [2760]
BBB_PSB     . . . . . [2760]
BBB_PLB     . . . . . [2760]
BBB_PLN     . . . . . [2760]
BBB_MNG     . . . . . [2760]
BBB_HIN     . . . . . [2760]
BBB_HIN     . . . . . [2760]
ABB_PGM     . . . . . [2760]
AB_AUK      . . . . . [2760]
AA_SAM      . . . . . [2760]
AA_MAL      . . . . . [2760]
AAA_HOM     . . . . . [2760]
AA_BKS      . . . . . [2760]

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TT_JCK          ACGATTCCGA TCTAGAGATAT GCTCCTATTTC ACTGGTTAAA GAAATGACTA TCCAGAACGA ATTAATCCCT TATTCCTTTT TTTTT--AT TTTTTTAAA GTACCCCTTT CTGAGATAGA [2880]
TT_FAA          ..... [2880]
TT_FTL          ..... [2880]
TT_TXT          ..... [2880]
BB_NAN          ..... [2880]
BB_SKT          ..... [2880]
BB_PKW          ..... [2880]
BB_P28          ..... [2880]
BB_CMR          ..... [2880]
BBB_LCK          ..... [2880]
BBA_PSB          ..... [2880]
BBBA_PLH          ..... [2880]
BBA_NWN          ..... [2880]
BBA_MNG          ..... [2880]
BBA_HIN          ..... [2880]
ABB_HIN          ..... [2880]
ABB_PGM          ..... [2880]
AB_AUK          ..... [2880]
AA_SAM          ..... [2880]
AA_MAL          ..... [2880]
AAA_HOM          ..... [2880]
AA_BKS          ..... [2880]

TT_JCK          AGAACAGGAA CAAAAGAAAT GGAATGTAAT AATCGAATG- --AATAAAA AAGAT---- ATTTATTTAT TCTTTTTTCC CATCCATATA GATGGAATTC TTATCACGAT [3000]
TT_FAA          ..... [3000]
TT_FTL          ..... [3000]
TT_TXT          ..... [3000]
BB_NAN          ..... [3000]
BB_SKT          ..... [3000]
BB_PKW          ..... [3000]
BB_P28          ..... [3000]
BB_CMR          ..... [3000]
BBB_LCK          ..... [3000]
BBA_PSB          ..... [3000]
BBBA_PLH          ..... [3000]
BBA_NWN          ..... [3000]
BBA_MNG          ..... [3000]
BBA_HIN          ..... [3000]
ABB_HIN          ..... [3000]
ABB_PGM          ..... [3000]
AB_AUK          ..... [3000]
AA_SAM          ..... [3000]
AA_MAL          ..... [3000]
AAA_HOM          ..... [3000]
AA_BKS          ..... [3000]

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TT\_JCK CGATCCTTAC ATTTATTGT GGCATAGAG GAGCCGTATG AAGCTGAGGT CTCATGTACG GTTTTGGAAAT AGCGATGGAA ACAGTAACGT TATTATCGAC TATAATTATC TAACAGTTCA [3360]  
 TT\_FAA ..... [3360]  
 TT\_FTL ..... [3360]  
 TT\_TXT ..... [3360]  
 BB\_NAN ..... [3360]  
 BB\_SKT ..... [3360]  
 BB\_PKW ..... [3360]  
 BB\_P28 ..... [3360]  
 BB\_CMR ..... [3360]  
 BBB\_LCK ..... [3360]  
 BBA\_PSB ..... [3360]  
 BBBÄ\_PLH ..... [3360]  
 BBA\_NWN ..... [3360]  
 BBA\_MNG ..... [3360]  
 BBA\_HIN ..... [3360]  
 ABB\_HIN TAG ..... [3360]  
 ABB\_PGM TAG ..... [3360]  
 AB\_AUK TAG ..... [3360]  
 AA\_SAM TAG ..... [3360]  
 AA\_MAL TAG ..... [3360]  
 AAA\_HOM TAG ..... [3360]  
 AA\_BKS TAG ..... [3360]  
 TT\_JCK AGTACAGTTG ATATAGTTGA AGCACATATG AAAATCCAGC AGAAGCAACG GGACGAATTG TATGTGCCAA TTGCCATTTA GCTAATAAAC CCGTGGATAT TGAAGTTCCG CAAGCTGTGC [3480]  
 TT\_FAA ..... [3480]  
 TT\_FTL ..... [3480]  
 TT\_TXT ..... [3480]  
 BB\_NAN ..... [3480]  
 BB\_SKT ..... [3480]  
 BB\_PKW ..... [3480]  
 BB\_P28 ..... [3480]  
 BB\_CMR ..... [3480]  
 BBB\_LCK ..... [3480]  
 BBA\_PSB ..... [3480]  
 BBBÄ\_PLH ..... [3480]  
 BBA\_NWN ..... [3480]  
 BBA\_MNG ..... [3480]  
 BBA\_HIN ..... [3480]  
 ABB\_HIN ..... [3480]  
 ABB\_PGM ..... [3480]  
 AB\_AUK ..... [3480]  
 AA\_SAM ..... [3480]  
 AA\_MAL ..... [3480]  
 AAA\_HOM ..... [3480]  
 AA\_BKS ..... [3480]





TT_JCK	GTCAGAAATA TACTGAAATC GTCTTTCCCA TTCTTTCCCC CGACCCCTGCT ACGAAGAAAG ACGTTCACCTT CTTAAATAT CCCATATACA TAGGTGGGAA CAGAGGAAGG GGTCAAATTT	[3840]
TT_FAA	.....	[3840]
TT_FTL	.....	[3840]
TT_TXT	.....	[3840]
BB_NAN	.....	[3840]
BB_SKT	.....	[3840]
BB_PKW	.....G.....	[3840]
BB_P28	.....G.....	[3840]
BB_CMR	.....G.....	[3840]
BBB_LCK	.....G.....	[3840]
BBA_PSB	.....G.....	[3840]
BBBA_PLH	.....G.....	[3840]
BBA_NWN	.....G.....	[3840]
BBA_MNG	.....G.....	[3840]
BBA_HIN	.....G.....	[3840]
ABB_HIN	.....G.....	[3840]
ABB_PGM	.....G.....	[3840]
AB_AUK	.....G.....	[3840]
AA_SAM	.....G.....	[3840]
AA_MAL	.....G.....	[3840]
AAA_HOM	.....G.....	[3840]
AA_BKS	.....G.....	[3840]
TT_JCK	ATCCTGATGG TAGCAAAAGT AACAAATACAG TCTATAATGC TACATCAGCA GGTATAGTAA GCAGAAATAGT ACGTAAAGAA AAAGGGGGAT ATGAAATAAC CATAGTTGAT GTATCCGGATG	[3960]
TT_FAA	.....	[3960]
TT_FTL	.....	[3960]
TT_TXT	.....	[3960]
BB_NAN	.....	[3960]
BB_SKT	.....	[3960]
BB_PKW	.....C.....	[3960]
BB_P28	.....C.....	[3960]
BB_CMR	.....C.....	[3960]
BBB_LCK	.....C.....	[3960]
BBA_PSB	.....C.....	[3960]
BBBA_PLH	.....C.....	[3960]
BBA_NWN	.....C.....	[3960]
BBA_MNG	.....C.....	[3960]
BBA_HIN	.....C.....	[3960]
ABB_HIN	.....C.....	[3960]
ABB_PGM	.....C.....	[3960]
AB_AUK	.....C.....	[3960]
AA_SAM	.....C.....	[3960]
AA_MAL	.....C.....	[3960]
AAA_HOM	.....C.....	[3960]
AA_BKS	.....C.....	[3960]

















TT\_JCK AGTACAAAAA TGAGTAATAA ACCCCAGTAT AGACTGGTAC GATTCAATTC AACATTTTGT TCATTGGGGT TTGATTGGT CATAGCTCTA TAATCAAAT TAGGTTTATC GTTGGATGAA [5760]  
 TT\_FAA ..... [5760]  
 TT\_FTL ..... [5760]  
 TT\_TXT ..... [5760]  
 BB\_NAN ..... [5760]  
 BB\_SKT ..... [5760]  
 BB\_PKW ..... [5760]  
 BB\_P28 ..... [5760]  
 BB\_CMR ..... [5760]  
 BB\_LCK ..... [5760]  
 BB\_PSB ..... [5760]  
 BBBB\_PLH ..... [5760]  
 BBA\_NWN ..... [5760]  
 BBA\_MNG ..... [5760]  
 BBA\_HIN ..... [5760]  
 ABB\_HIN ..... [5760]  
 ABB\_PGM ..... [5760]  
 AB\_AUK ..... [5760]  
 AA\_SAM ..... [5760]  
 AA\_MAL ..... [5760]  
 AAA\_HOM ..... [5760]  
 AA\_BKS ..... [5760]

CTGCATTGCT GATA [5774]  
 TT\_JCK ..... [5774]  
 TT\_FAA ..... [5774]  
 TT\_FTL ..... [5774]  
 TT\_TXT ..... [5774]  
 BB\_NAN ..... [5774]  
 BB\_SKT ..... [5774]  
 BB\_PKW ..... [5774]  
 BB\_P28 ..... [5774]  
 BB\_CMR ..... [5774]  
 BB\_LCK ..... [5774]  
 BBA\_PSB ..... [5774]  
 BBBB\_PLH ..... [5774]  
 BBA\_NWN ..... [5774]  
 BBA\_MNG ..... [5774]  
 BBA\_HIN ..... [5774]  
 ABB\_HIN ..... [5774]  
 ABB\_PGM ..... [5774]  
 AB\_AUK ..... [5774]  
 AA\_SAM ..... [5774]  
 AA\_MAL ..... [5774]  
 AAA\_HOM ..... [5774]  
 AA\_BKS ..... [5774]







BBA\_NWN\_20 GT-----GTA AGGTGTGGGG AAAGACCGGA GGAAAGATAT ATGGTCCTGC CACAGGAACA [ 360]  
 BBA\_NWN\_29 ..-----... [ 360]  
 AAB\_NGA\_03 ..GTAAG... ..T...T... [ 360]  
 AAB\_NGA\_10 ..GTAAG... ..T... [ 360]  
 BBA\_NWN\_64 ..GTAAG... ..T... [ 360]  
 AAB\_NGA\_82 ..GTAAG... ..T... [ 360]  
 ABB\_HMO\_95 A.GTAAG... ..T... [ 360]  
 BBA\_NWS\_13 ..GTAAG... ..T... [ 360]  
 AAB\_KPL\_31 .NNTTAG... ..NG..NN ..A.N.NC... N...G...NN TNN..NNN.C [ 360]  
 BBA\_NWM\_96 ..GTAAG... ..T... [ 360]  
 BBA\_NWN\_23 ..-----... .N... ..N.N.. N... [ 360]  
 AAB\_NGA\_17 ..-----... [ 360]  
 AAB\_NGA\_14 ..-----... [ 360]  
 AAB\_NGA\_02 ..-----... [ 360]  
 ABB\_HMI\_89 ..-----... [ 360]  
 BB\_CMR\_05 ..-----... ..N.. [ 360]  
 BBA\_NWN\_18 ..-----... [ 360]  
 BBA\_HIN\_99 ..-----... ..N.. .C... ..NC.. [ 360]  
 AAB\_TBK\_09 ..-----... ..R... ..NN.. [ 360]  
 BBA\_NWN\_22 ..-----... [ 360]  
 BBA\_NWN\_46 ..-----... [ 360]  
 BBA\_NWN\_66 ..-----... [ 360]  
 BB\_PKW\_03 ..-----... [ 360]  
 BB\_NAN\_06 ..-----... [ 360]  
 BB\_NAN\_11 ..-----... [ 360]

BBA\_NWN\_20 GATTACGAAG ACAACCAGCA AAGATTCAGC CTTTCTGTC AGGTCAGTGA TTATTAATTA [ 420]  
 BBA\_NWN\_29 .. [ 420]  
 AAB\_NGA\_03 ..G..T... [ 420]  
 AAB\_NGA\_10 ..G..T... [ 420]  
 BBA\_NWN\_64 .. [ 420]  
 AAB\_NGA\_82 ..G..T... [ 420]  
 ABB\_HMO\_95 ..C... [ 420]  
 BBA\_NWS\_13 ..G..T... [ 420]  
 AAB\_KPL\_31 NNN.N.NC... ..T...NN.. C.NNN... ..N.. TT..T... NG...N.N [ 420]  
 BBA\_NWM\_96 ..T...C [ 420]  
 BBA\_NWN\_23 .. [ 420]  
 AAB\_NGA\_17 ..C... [ 420]  
 AAB\_NGA\_14 .. [ 420]  
 AAB\_NGA\_02 .. [ 420]  
 ABB\_HMI\_89 .. [ 420]  
 BB\_CMR\_05 .. [ 420]  
 BBA\_NWN\_18 .. [ 420]  
 BBA\_HIN\_99 ..T.NN.. N... ..C.. [ 420]  
 AAB\_TBK\_09 ..N... ..N.. [ 420]  
 BBA\_NWN\_22 .. [ 420]  
 BBA\_NWN\_46 .. [ 420]  
 BBA\_NWN\_66 .. [ 420]  
 BB\_PKW\_03 .. [ 420]  
 BB\_NAN\_06 ..C... [ 420]  
 BB\_NAN\_11 .. [ 420]

BBA\_NWN\_20 CTAACCAAAA TTCAGCATCG ATTTCTAAGT TACTGCGA AGCAATTA-- -----GTG [ 480]  
 BBA\_NWN\_29 .. [ 480]  
 AAB\_NGA\_03 ..T... ..T.. [ 480]  
 AAB\_NGA\_10 ..T... [ 480]  
 BBA\_NWN\_64 ..G-- [ 480]  
 AAB\_NGA\_82 ..T... [ 480]  
 ABB\_HMO\_95 .. [ 480]  
 BBA\_NWS\_13 ..T.C... [ 480]  
 AAB\_KPL\_31 ..NN...NNC .NN.C..NNN N..N..N..A .N...N.. CN.TG... [ 480]  
 BBA\_NWN\_96 .. [ 480]  
 BBA\_NWN\_23 ..R.Y... ..CC GAACCTTT.. [ 480]  
 AAB\_NGA\_17 ..G... ..CT GAACCTTT.. [ 480]  
 AAB\_NGA\_14 ..G... ..CT GAACCTTT.. [ 480]  
 AAB\_NGA\_02 ..G... ..CT GAACCTTT.. [ 480]  
 ABB\_HMI\_89 ..G... ..CT GAACCTTT.. [ 480]  
 BB\_CMR\_05 ..G... ..CC GAACCTTT.. [ 480]  
 BBA\_NWN\_18 ..C.G... ..G... ..CC GAACCTTT.. [ 480]  
 BBA\_HIN\_99 ..N.G... ..T... ..G..T..N.N.. ..N.CC GAACCTTT.A [ 480]  
 AAB\_TBK\_09 ..R.T... ..Y... ..CC GAACCTTN.. [ 480]  
 BBA\_NWN\_22 ..G.T... ..CC GAACCTTT.. [ 480]  
 BBA\_NWN\_46 ..G.T... ..CC GAACCTTT.. [ 480]  
 BBA\_NWN\_66 ..G.T... ..CC GAACCTTT.. [ 480]  
 BB\_PKW\_03 ..G.T... ..CC GAACCTTT.. [ 480]  
 BB\_NAN\_06 ..G... ..CT GAACCTTT.. [ 480]  
 BB\_NAN\_11 ..G... ..CT GAACCTTT.. [ 480]









BBA\_NWN\_20 TGAAAA---- -CTCATATGA TGTGTTCCAT GCAGGTACGA CAAGCC???? [1080]  
 BBA\_NWN\_29 ...G.TTCT CTTGATGAAA A..... .G....CGTG [1080]  
 AAB\_NGA\_03 ...G.TTCT CTTGATGAAA A..... .G....CGTG [1080]  
 AAB\_NGA\_10 ...G.TTCT CTTGATGAAA A..... .G....CGTG [1080]  
 BBA\_NWN\_64 ...G.TTCT CTTGATGAAA A..... .G....CGTG [1080]  
 AAB\_NGA\_82 .....GGTG [1080]  
 ABB\_HMO\_95 ...G.TTCT CTTGATGAAA AN..N.... .N...NGG? ?????????? ?????????? [1080]  
 BBA\_NWS\_13 ...G.TTCT CTTGATGAAA AN..N.... .N...NGG? ?????????? ?????????? [1080]  
 AAB\_KPL\_31 ...G.TTCT CTTGATGAAA A...N.... .A.GG?? ?????????? ?????????? [1080]  
 BBA\_NWM\_96 ...G.TTCT CTTGATGAAA A..... .G....CGTG [1080]  
 BBA\_NWN\_23 ...G.TTCT CTTGATGAAA A..... .G....CGTG [1080]  
 AAB\_NGA\_17 ...G.TTCT CTTGATGAAA A.....G... .G....CGTG [1080]  
 AAB\_NGA\_14 ...G.TTCT CTTGATGAAA A..... .G....CGTG [1080]  
 AAB\_NGA\_02 .....GGTG [1080]  
 ABB\_HMI\_89 .....A--- -...C...N ....NGG? ?????????? ?????????? [1080]  
 BB\_CMR\_05 ..... -...C.N..N ..N.A.G?? ?????????? ?????????? [1080]  
 BBA\_NWN\_18 .....GGTG [1080]  
 BBA\_HIN\_99 ..???????? ?????????? ?????????? ?????????? ?????????? ?????????? [1080]  
 AAB\_TBK\_09 ..???????? ?????????? ?????????? ?????????? ?????????? ?????????? [1080]  
 BBA\_NWN\_22 .....GGTG [1080]  
 BBA\_NWN\_46 .....GGTG [1080]  
 BBA\_NWN\_66 .....GGTG [1080]  
 BB\_PKW\_03 .....GGTG [1080]  
 BB\_NAN\_06 ?????????? ?????????? ?????????? ?????????? ?????????? ?????????? [1080]  
 BB\_NAN\_11 ?????????? ?????????? ?????????? ?????????? ?????????? ?????????? [1080]

BBA\_NWN\_20 ?????????? ?????????? ?????????? ?? [1112]  
 BBA\_NWN\_29 AAAGGAAGGA AAATTAAGCTG GATGAAGGCT AA [1112]  
 AAB\_NGA\_03 AAAGGAAGGA AGATAAATTG GATGAAGGCT GG [1112]  
 AAB\_NGA\_10 AAAGGAAGGA AAATCAATTG GATGAAGGCT GG [1112]  
 BBA\_NWN\_64 AAAGGAAGGA AAATCAACTG GATGAAGGCT GG [1112]  
 AAB\_NGA\_82 AAAGGAAGGA AAATTAAGCTG GATGAAGGCT GG [1112]  
 ABB\_HMO\_95 ?????????? ?????????? ?????????? ?? [1112]  
 BBA\_NWS\_13 ?????????? ?????????? ?????????? ?? [1112]  
 AAB\_KPL\_31 ?????????? ?????????? ?????????? ?? [1112]  
 BBA\_NWM\_96 AAAGGAAGGA AGATAAATTG GATGAAGGCT GG [1112]  
 BBA\_NWN\_23 AAAGGAAGGA AGATCAACTG GATGAAGGCT GG [1112]  
 AAB\_NGA\_17 AAAGGAAGGA AAATAAATTG GATGAAGGCT GG [1112]  
 AAB\_NGA\_14 AAAGGAAGGA AAATAAATTG GATGAAGGCT GG [1112]  
 AAB\_NGA\_02 AAAGGAAGGA AGATAAATTG GATGAAGGCT GG [1112]  
 ABB\_HMI\_89 ?????????? ?????????? ?????????? ?? [1112]  
 BB\_CMR\_05 ?????????? ?????????? ?????????? ?? [1112]  
 BBA\_NWN\_18 AAAGGAAGGA AGATAAATTG GATGAAGGCT GG [1112]  
 BBA\_HIN\_99 ?????????? ?????????? ?????????? ?? [1112]  
 AAB\_TBK\_09 ?????????? ?????????? ?????????? ?? [1112]  
 BBA\_NWN\_22 AAAGGAAGGA AGATCAACTG GATGAAGGCT GG [1112]  
 BBA\_NWN\_46 AAAGGAAGGA AAATAAAGCTG GATGAAGGCT GG [1112]  
 BBA\_NWN\_66 AAAGGAAGGA AGATAAAGCTG GATGAAGGCT GG [1112]  
 BB\_PKW\_03 AAAGGAAGGA AAATCAATTG GATGAAGGCT GG [1112]  
 BB\_NAN\_06 ?????????? ?????????? ?????????? ?? [1112]  
 BB\_NAN\_11 ?????????? ?????????? ?????????? ?? [1112]

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## BIOGRAPHY

Sasivimon Swangpol (maiden name, Chomchalow) was born in Bangkok, Thailand, on 13 August 1966. She earned her Bachelor Degree in Science with Honors in Botany from the Department of Botany, Faculty of Science, Chulalongkorn University, Bangkok, in 1988. In 1991, she received her Master of Science Degree in Horticulture from the Horticulture Department, Institute of Florida Agricultural Science, University of Florida, Gainesville, Florida, USA. After graduation, she worked as a general manager at the Siam Flower Lab Company Limited for 3 years. Since March 1995, she has joined the Department of Plant Science, Faculty of Science, Mahidol University. In 1999, she pursued her Ph.D. study in Biological Science Ph.D. Program, Faculty of Science, Chulalongkorn University. She was appointed for a research assistantship by the Biodiversity Research and Training Program (BRT), the Thailand Research Fund (TRF) in 2002.

Sasivimon Swangpol is married to Mr. Jackrawut Swangpol and has two daughters, Malaivee, 8, and Mapa, 6. They reside in Bangkok.

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