

APPENDIX

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A.1 Sequences of *cat-sacB* gene

ACACTGCTTCCGGTAGTCAATAAACCGNATCGGCATTTTCTTTTGCCTTTTTATTTGT
TAACTGTTAATTGTCCTTGTTCAAGGATGCTGTCTTTGACAACAGATGTTTTCTTGCCTTTGATG
TTCAGCAGGAAGCTTGGCGCAAACGTTGATTGTTTGTCTGCGTAGAATCCTCTGTTTGCATAT
AGCTTGTAATCACGACATTGTTTCTTTTCGCTTGAGGTACAGCGAAGTGTGAGTAAGTAAAGGT
TACATCGTTAGGATCAAGATCCATTTTTAACACAAGGCCAGTTTTGTTTACAGCGGCTTGTATGGG
CCAGTTAAAGAATTAGAAACATAACCAAGCATGTAATATCGTTAGACGTAATGCCGTCAATCG
TCATTTTTGATCCGCGGGAGTCAGTGAACAGGTACCATTTGCCGTTTCATTTTAAGACGTTTCGC
GCGTTCAATTTTCTGTTACTGTGTTAGATGCAATCAGCGTTTTTCACTTTTTTTCAGTGTGT
AATCATCGTTTAGCTCAATCATAACGAGAGCGCGTTTGCTAACTCAGCCGTGCGTTTTTTATC
GCTTTGCAGAAGTTTTTACTTTTCTTGACGGAAGAATGATGTGCTTTTGCCATAGTATGCTTTGT
TAAATAAAGATTCTTCGCTTGGTAGCCATCTTCAGTTCAGTGTGTTGCTTCAAATACTAAGTAT
TTGTGGCCTTTATCTTCTACGTAGTGAGGATCTCTCAGCGTATGGTTGTCGCCTGAGCTGTAGT
TGCCTTCATCGATGAACTGCTGTACATTTTGATACGTTTTTCCGTCACCGTCAAAGATTGATTTA
TAATCCTCTACACCGTTGATGTTCAAAGAGCTGTCTGATGCTGATACGTTAACTTGTGCAGTTGT
CAGTGTGTTGTTGCCGTAATGTTTACCGGAGAAATCAGTGTAGAATAAACGGATTTTTTCCGTC
GATGTAATGTGGCTGAACCTGACCATTCTTGTGTTTGGTCTTTTAGGATAGAATCATTTGCATC
GAATTTGTCGCTGTCTTTAAAGACGCGGCCAGCGTTTTTCCAGCTGTCAATAGAAGTTTCGCCG
ACTTTTTGATAGAACATGTAATCGATGTGTCATCCGCATTTTTAGGATCTCCGGCTAATGCAAA
GACGATGTGGTAGCCGTGATAGTTTGCACAGTGCCGTCAGCGTTTTGTAATGGCCAGCTGTCC
CAAACGTCCAGGCCTTTTGCAGAAGAGATATTTTTAATTGTGGACGAATCGAATTCAGGAACTT
GATATTTTTTCATTTTTTGCTGTTTACAGGATTTGCAGCATATCATGGCGTGAATATGGGAAATG
CCGTATGTTTCTTATATGGCTTTTGGTTTCGTTTCTTTTCGCAAACGCTTGAGTTGCGCCTCCTGC
CAGCAGTGCGGTAGTAAAGGTTAATACTGTTGCTTGTGTTTGCAAACTTTTTGATGTTTTCATCGTTC
ATGTCTCCTTTTTATGTAATGTGTTAGCGGTCTGCTTCTTCCAGCCCTCCTGTTTGAAGATGGC
AAGTTAGTTACGCACAATAAAAAAAGACCTAAAATATGTAAGGGGTGACGCCAAAGTATACT
TTGCCCTTTACACATTTTAGGCTTGCCTGCTTTATCAGTAACAAACCCGCGGATTTACTTAGA
TCTAGCGGCTATTTAACGACCCTGCCCTGAACCGACGACCGGGTCAATTTGCTTTCAATTTT

TGCCATTCATCCGCTTATTATCACTTATTAGGCGTAGCACCAGGCGTTTAAGGGCACCAATAAC
 TGCCTTAAAAAATTACGCCCCGCCCTGCCACTCATCGCAGTACTGTTGTAATTCATTAAGCATT
 CTGCCGACATGGAAGCCATCACAAACGGCATGATGAACCTGAATCGCCAGCGGCATCAGCACCT
 TGTGCGCTTGCGTATAATATTTGCCCATGGTGAAAACGGGGCGAAGAAGTTGTCCATATTGGC
 CACGTTTAAATCAAACTGGTGAACTCACCCAGGGATTGGCTGAGACGAAAAACATATTCTCA
 ATAAACCCTTTAGGGAAATAGGCCAGGTTTTACCGTAACACGCCACATCTTGCGAATATATGT
 GTAGAACTGCCGAAATCGTCGTGGTATTCACTCCAGAGCGATGAAAACGTTTCAGTTTGCTC
 ATGGAACGGTGTAACAAGGGTGAACACTATCCCATATCACCAGCTCACCGTCTTTCATTGCC
 ATACGGAATCCGGATGAGCATTATCAGGCGGGCAAGAATGTGAATAAAGGCCGGATAAACT
 TGTGCTTATTTTTCTTACGGTCTTTAAAAGGCCGTAATATCCAGCTGAACGGTCTGGTTATAG
 GTACATTGAGCAACTGACTGAAATGCCTCAAATGTTCTTTACGATGCCATTGGGATATATCAAC
 GGTGGTATATCCAGTGATTTTTTTCTCCATTTTAGCTTCCTTAGCTCCTGAAAATCTCGATAACT
 CAAAAATACGCCCGGTAGTGATCTTATTTTATTATGGTGAAAGTTGGAACCTCTTACGTGCCG

A.2 Sequences of *budAB* gene (*budAB'*-*budAB''*)

AGCGCAGATAACGAAGTTCCATATCGAAAACGTCTCAAACAAGCATAGATTCTATATTGG
 AACTGTGAGCTGAATCGCGTCAACATTTATTTAACCTTTCTGATATTCGTTGAACGAGGAAGCGG
 GTAATGAACCATTCTGCTGAATGCTCTTGTGAAGAGAGCCTGTGTGAACTCTACGAGGGTTTT
 CCGCGCAACATCCCGATAGCGTCATCTACCAGACCTCTCTGATGAGCGCGCTGTTGAGCGGCGT
 TTATGAAGGCAATACCACCATCGCTGATTTACTCACCCACGGCGATTTTGGCCTGGGAACCTTT
 AATGAACTGGACGGCGAGCTGATCGCGTTTAGCAGCGAGGTATACCAGCTGCGCGCCGACGGC
 AGCGCCCGTAAAGCCCGAATGGAACAGCGCACGCCGTTTGCGGTGATGACCTGGTTTCAGCCGC
 AGTAGGGTTCGATAACGGCTACAACATGGTGGCAATTCAGGAAGAGAAAAAATATCAGCGGCTAT
CCGGCGTTGAGTTCGGCCCCGGTGGATTTTAAAGCCTATGCCGAAGCCTTCGGCGCCAGAGGGTT
CGCGGTTCGAGAGCGCCGCCCTTGAGCCGACGCTGCGGGCGGCGATGGACGTCGATGGCCC
CGCCGTGGTCGCCATCCCCGTCGATTACAGCGACAACCCGCTGCTGATGGGCCAGCTTCATCTC
AGTCAACTACTTTGAGTCACTACAGAAGGAATCCAGCAATGAAAAAAGTCGCACTCGTGACCGG
CGCAGGCCAGGGTATCGGTAAAGCTATCGCCCTTCGCTGGTTCAAGATGGCTTTGCCGTGGCC
ATCGCCGATTATAACGATGCCACCCGACAGGCGGTGCTGACGAAATTAACCAGCACGGCGGCC
AGGCGCTGGCGGTGAAGGTCGATGTCTCGAAACGCGATC

Note: Normal letters are *budAB'* gene (incomplete gene), underline letters are *budAB''* (incomplete gene).

A.3 Sequences of *budAB* gene *pflB* (*pflB'*-*pflB''*)

TATGTCCGAGCTTAATGAAAAGTTAGCCACAGCCTGGGAAGGTTTTGCGAAAGGTGACTG
 GCAGAACGAAGTCAACGTCCGCGACTTCATCCAGAAAACTATACCCCGTACGAAGGTGACGAG
 TCCTTCCTGGCTGGCGCAACTGACGCGACCACCAAGCTGTGGGACACCGTAATGGAAGGCGTTA
 AACAGGAAAACCGCACTCACGCGCCTGTTGATTTTTGATACTTCCCTTGATCCACCATCACTTCT
 CATGACGCTGGCTACATCGAGAAAGGTCTCGAGAAAATCGTTGGTCTGCAGACTGAAGCTCCGC
 TGAAACGCGCGATTATCCCGTTCGGCGGCATCAAATGGTAGAAGGTTCTGCAAAGCGTACAA
 TCGCGAGCTGGACCCGATGCTGAAGAAAATCTTCACTGAATACCGCAAAACTCACAACCAGGGC
 GTGTTTGACGTTTACACCAAAGACATCCTGAACTGCCGTAATCTGGCGTTCTGACCGGTCTGC
 CGGATGCCTATGGCCGTGGTCGTATCATCGGTGACTACCGTCGCGTTGCGCTGTACGGTATCGA
 CTTCTGATGAAAGACAAATACGCTCAGTTCGTCTCTCTGCAAGAGAAACTGGAAAACACGCTA
TCCCGACTCAGTCCGTTCTGACCATCACCTCTAACGTTGTGTATGGTAAGAAAACCGGTAACAC
CCCTGACGGTCGTCGCGCTGGCGCTCCGTTCCGACCAGGTGCTAACCCGATGCACGGCCGTGAC
CAGAAAGGTGCTGTTGCCTCTCTGACCTCCGTTGCGAAACTGCCGTTTGCTTACGCGAAAGATG
GTATTTCTTACACCTTCTCTATCGTGCCGAACGCGCTGGGTAAAGACGACGAAGTTCGTA AAAAC
TAACCTCGCCGGCCTGATGGATGGTTACTTCCACCACGAAGCGTCCATCGAAGGCGGTGACGAT
CTGAACGTCAACGTTATGAACCGCGAAATGCTGCTCGACGCGATGGAAAACCCGGAAAAATATC
CGCAGCTGACCATCCGCGTATCCGGCTACGCAGTACGTTTTAACTCCCTGACGAAAGAACAGCA
GCAGGACGTTATTACTCGTACCTTCACTCAGACCATGTAA

Note: Normal letters are *pflB'* gene (incomplete gene), underline letters are *pflB''* (incomplete gene).

A.4 Sequences of *tdcD* gene (*tdcD'*-*tdcD''*)

GCGAGGCGTCGATTATCGCTTGCGATATCGCCACCAAATCCGGCGCGGTGGAGATCGGT
 TTTCTCGACCGTTTTACCGGCGCCGTGGTGCTGACCGGCGACGTTTCCGCCGTGGAATATGCCC
 TCAAGCAGGTGACGCGCACCCTGGGCGAGATGATGCAGTTTACTACCTGCTCAATAACCCGGAC
 GTAGCGCGATGAAGCGTCTGATGTTTATCGGCCCGAGTCAGTGCGGCAAGACCTCGCTAACCCA
 GGGCCTGCGCGGCGAAGCGCTCCATTATAAGAAAACCCAGGCCATTGAATGGTCGCCGATGGCC
 ATCGATACGCCGGGGGAATATCTGGAGAACCGCTGCCTGTATAGCGCCCTGCTGACCAGCGCCT
 GCGAGGCTGACGTTATCGCGCTGGTACTGAATGCCGACGCCAGTGGTCGCCGTTTTCTCCGGG
 GTTTACCGCCCCGATGAATCGCCCCGACGATTGGCCTGGTCACCAAAGCCGACCTCGCCGACCT
 CAGCGGATATCGCTCATCGCGGAGTGGCTTACGCAGGCTGGCGCCGGGCAGATTTTTGTTACCA

GCGCGTTGAACAATTCGGGTCTCGACGCGGTGCTGGATTTTCTGAATTCGAAGGAACCCCTTATG
 TCTTACAAAATAATGGCCATTAACGCCGGCAGCTCATCGTTAAAATTCCAGCCGGAACCTTAA
CCGTTTCAGCCTGATTTTCGCCGCCCGCAAGTTGCGGTGAATCATGGTAATAGCGGGATCGGCA
TGACACTATGCGCCCTGGAACCTGAGCAATAGGTGAATATGTGGCCGTAGCGCAATGCCCCG
CTCCTGTGGGGAACCTCATCCAGGGCTGGATCCTCGGCAGCGAGAAGCTGGTCTCCTGCCCCGT
GACTGGTACAGCACCGTCGAGGTGGACTACGGTTCGCCTCGCGCAGATGAACGCCCGCTGTGCG
GGGCGATGGTCGACCGGCTGCTGGGCTACTGGCGCTATCCGGCGGAGCTAGGCAAAGAGATTC
GGATCGATATTTGCTCCACGATTCCGGTCGCCAAAGGGATGGCCAGCAGCACCGCGGATATCG
CGGACGGCGGTGGCCACCGCGCATCATCTCGGCCATCCGCTGGATGAAACCACCCTCGCCCCG
GCTCTGCGTTTTCCCTGGAGCCCACCGACAGCACCTGTTCCGCCAGTTGACGCTATTCGATCAC
AATACCGCCGCCACGCAAATTACCTGCGGCTGCCAGCCTCAGCTCGATCTGCTGGTGCTGGAAA
GCCCCGCCACGCTGCTGACCACCGATTACCACC

Note: Normal letters are *tdcD'* gene (incomplete gene), underline letters are *tdcD''* (incomplete gene).

A.5 Sequences of *tdcD* gene (*pmd'*-*pmd''*)

GTTTATAGCGCTGCTGAACGAAGATCGGCAAGCAGCATCTTCTCCATAAAGATGCTTAAC
 GGATCCGGCTGATACGGCGCAAAGGCGCTACGGGTCTGGTAGCCATTGCGCGTATATAACGCAA
 CGGCGGCGTGCTGATGGATGCCCGTTTCCAGGCGCACGGTATGGCATTGCGGATTTATCGCCTC
 TTCCTCCAGCGCGCCAGCAGTCGTTCTCCAGCTGCTGCCCGCGATGGGCCGGGTGAATAAAC
 ACCCTTTTCATCTCGCCAACCCCTCTTCGCCGAGCACGATCGCCCCGCAGCCGACGGCCTGGC
 GCTGCGTATCGGAATAAGAAGCGCAATAACCGACTCCGCCGGTAGCGCGCTCAGGTCGATCAA
 ATGGTTGCTCTCAGCCGGGTAGAGCGTCTGCTGATACGCGTCCAGTTCGGCAATTAAGGCCATC
 AGATCCGGGTGGTTTTGCGGGGTTGGGGTGATTGTGTACATAAAGAAGCTCCTTTTTGACCATA
 CTGTAGCGCGGAGCGTCTCGCAGGCGGCCATAGCATTAACTTATCGCTTCACACCTCGCTTGCG
 CTTCCCCCTAAAGTGGCAGTAATTTTGCATGACGACATTTATCAGGAACAACCATGAATAC
 CAAAGCGCGCAATATCGCCCCGCTACCGTAACCCGCTTTCCGGCTAGTCGGCAATGATCAGCC
GGGATGGATATGCCCCAGCAGTTCACGCGTCTCTCCGGCAGATGATTATCGGTGATGATGTC
GGTGAGCGAGTCGAGATGGGTGATGTTAAACAGCGACCAGGCGCCGTATTTGAGCTGTCCGCC
AGCAGAATGCGCCGCCGGCGTTCGCGATTAAATCCCGCTTCAGCGCCGCTTTCTCTCCGTTG
GCGAGTTACGCCCTTCTCCAGATCCAGCCGTTGCAGCTGACGAACGCCAGATCGGGCCAGAT
ATTTTGCAGCAGACGGCGTCCGTGATCGCCGATGCAGGACTGGCTGCTGTCGTCGATGCGTCCG

CCGATGATGGTAACTTCAATTTGCTTAAATTCCGAGAGAAACAGGGCGATATGCAGATCGCTGG
TGATCACCCGCAGCGGCAAGTGGGTTATCTGCCGGGCAAGTTCGATCATCGTGGTTCCGGCATC
GAGGACGATGGCGTCCCCGGCCTTGACTAACGCCGCCGCCGCGCTGGCGATGGCGTATTTTTCC
TGCAGACTGCGCTGGGACTTCTCCTGGGTGGTGGGCTGTGAAGGAATAAACCGGTTGAGCGTGA
CGCCGCCGTGGGTACGGCTGATGACCCCTTCCTGATCGAGCTTAATCAGGTCGCGGCGAATT

Note: Normal letters are *pmd'* gene (incomplete gene), underline letters are *pmd''* (incomplete gene).