**Table S1.** One hundred and forty-four SSR primer pairs were used for pre-evaluation in the 11 elite oil palms using a 53 °C annealing temperature.

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| --- | --- | --- | --- |
| Primer name | Motifs | Forward primer (5'-3') | Reverse primer (5'-3') |
| mdNGS001 | (ATT)5 | GAGATCCATGGACCCAACAC | TGAAATACACATGCATGCCC |
| mdNGS002 | (ATT)6 | GCCTCCACCAATCCAGACTA | GGTCTTCACGAAGGAGCAAG |
| mdNGS003 | (ATT)7 | TCCAATATTCCCATTGGTCG | GGACGTTACAGCGAAAGAGC |
| mdNGS004 | (ATT)35 | TGCTTAAGACCATCTACAAGCAAA | GGAGGGATGGTCATCTTTGA |
| mdNGS005 | (ATT)7 | GATTGTTTTGCTTGGATGGC | TCCAGGGAACTAGAGACACGA |
| mdNGS006 | (ATT)6 | TTGGCAAAGGGAAGCTTAAA | GTGTCATGTGTGTTCCCACC |
| mdNGS007 | (ATT)11 | TGTGATTCGGAGGAGGATCT | AACGTCGTCGTCTGTCTCCT |
| mdNGS008 | (ATT)6 | TTCACTGTTGGAAGGCACAG | TCTCACCAACAAATACCGCA |
| mdNGS009 | (ATT)5 | TGATGCATGATGGTAGGTCC | TTTCAAATAAGATGGCGAAGG |
| mdNGS010 | (ATT)5 | AGGAAGAGAACGGATGGCTT | AAGCACCGGAAAAGGAGACT |
| mdNGS011 | (ATT)6 | GGTATTTGGATTCCGTCACC | TCATAACATTCGTACACGCCA |
| mdNGS012 | (ATT)5 | GGCAGGTTCTAAGGGAAACA | CCCACCATCAATCATCATCA |
| mdNGS013 | (ATT)6 | CCGAGAAGACTTATTCCTTGTTG | GGATCTCATGCCATATAATCCAA |
| mdNGS014 | (ATT)13 | TGATGATGCTAGAGGCCATT | TCATGCTTTCGCAATGAAAA |
| mdNGS015 | (ATT)5 | GCATTGCCGTTGCTAAAGA | AATAATGGGAATGTCGTCGC |
| mdNGS016 | (ATT)5 | TTCATTGTTTTGAATACGCCT | GATCACTTGGATTGATTTGCAG |
| mdNGS017 | (ATT)15 | AATAGCCAGGCCCAATAGGT | AACAGCCCAATAAGAATCCC |
| mdNGS018 | (ATT)7 | GACATCCAGATTGGGTTTGG | TTACATTACGCCTGGAAGGG |
| mdNGS019 | (ATT)6 | CGGAGGACGACGATCAGTT | CGTCGTCATCTGTCTCTTGG |
| mdNGS020 | (ATT)6 | GCATAGATGCAAAAGGGCAT | CCTGCAATGGTTATGTGTGC |
| mdNGS021 | (ATT)5 | CCGAGCCATACTTGAGCCTA | AAGGGTACAAATGAGCTGGG |
| mdNGS022 | (ATT)6 | CGATTACTGTGATTCGGACG | CGTCTATCTCCTGGTGCCAT |
| mdNGS023 | (ATT)5 | ATCTTGGCCCACTCTATCCA | TTGAAATCATACTTAAAATGCCAGA |
| mdNGS024 | (ATT)7 | ACGGTCACTTCTCAGCACCT | CTGTTGCCCATTTAAAGCAA |
| mdNGS025 | (ATT)6 | TGATAAGTCAAAGGGTGACGA | TCGTCTATCTCCTGATGCCA |
| mdNGS026 | (ATT)9 | GTCAATAGCGAATGGAGGGA | TCCTCGAGTTGGAGGTAGAGAC |
| mdNGS027 | (ATT)5 | TCAATCCTAACCCTAGCCTTAAC | CCAGCGACCACCAAAAATAA |
| mdNGS028 | (ATT)5 | TTCATCTATTTAGATTTTGAATTTGC | CGATCAATCATGAGCCCTCT |
| mdNGS029 | (ATT)7 | TGAGGATCTGCATATCGAGGA | GATGAAGGTGCCTCAACCTC |
| mdNGS030 | (ATT)7 | GAAGACAAAGTTGGATGCCC | TGGTAGGAATAGGCAATGGG |
| mdNGS031 | (ATT)5 | CACTCCAAAGAGATGGGGAA | ATGGAACATAGCATCGGCTC |
| mdNGS032 | (ATT)5 | TTCTTCGTTCAATTTTGTATTGC | GATGAAGGTGCCTCAACCTC |
| mdNGS033 | (ATT)7 | TGGGTCAAGAAAGGGTGATG | TTTTTGGAGATCTAGGCACGA |
| mdNGS034 | (ATT)5 | TGGAGACTGTTAGAAGGCCG | AATTGACAACGAGGCACTGA |
| mdNGS035 | (ATT)9 | CGGACAAGATTTTCTCCAACA | TCAGAACAATGTAATCGTCAGC |
| mdNGS036 | (ATT)6 | TCCGATGAGCTTGTCACTGT | ATGGATGCACTAGGGCTGAC |
| mdNGS037 | (ATT)6 | ATTGTGATTCGGACGAGGAT | GAAGGTGCCTCAACCTCTGA |
| mdNGS038 | (ATT)6 | TTGTGATTCGAAGGAGGATCT | GCCTCTGGGGTAGACTGTGA |
| mdNGS039 | (ATT)5 | TGCTATCCAACAGCGAACAG | AACCTACCCATAGATGCACCA |
| mdNGS040 | (ATT)5 | TGGTGGAACTGGTACACTGG | GAGGTCACACTTGTGCTAAACG |
| Primer name | Motifs | Forward primer (5'-3') | Reverse primer (5'-3') |
| mdNGS041 | (ATT)5 | CTCAGCTTCCCAATCCTGAA | GATTGGCCGCAACAGATATT |
| mdNGS042 | (ATT)6 | CAATTCCGTGTCATCTCCAA | AGGATTGTGCTCCCCTCTCT |
| mdNGS043 | (ATT)5 | CGGCTAAATGCCATCACTAA | GCGACAGCATTATTGTTGCTAA |
| mdNGS044 | (T)10(ATT)5 | GCATAATTGGATGCTTAAATGC | CTATCAGCCAAGTTGGGGAG |
| mdNGS045 | (ATA)5(ATT)5 | TTGGGAATTCAAATAATGTTGC | CCACTAATGAGATTATCCGTGC |
| mdNGS046 | (ATT)5(ATT)5 | GCTGGAGTGAAGAGGATTCG | GGCAGCTAAACCTGATCCAT |
| mdNGS047 | (ATC)9(ATT)10 | AAACGAGTGAAATGGGTCAAG | TCAGAATGGTTTCACCTCCC |
| mdNGS048 | (ATA)10(ATT)17 | GCTAAGCCAAAGCTAAGCCTG | CACTTTTCGTTTACAATTCCTCG |
| mdNGS049 | (AGG)7 | GGAGAGGTCTCTTCCCATCC | TCCCAGCCAAACTCATCTTC |
| mdNGS050 | (AGG)5 | GCCAATCAATTCAAAATGCC | GGAATGGTGGTGTCCTTAGC |
| mdNGS051 | (AGG)5 | GTGCCAGTTGCTCGTTGTTA | CCATTTGTGATGAGCACCAG |
| mdNGS052 | (AGG)5 | TTTTCGTTACAGGATGTTGGG | AAAGTAGGTCCGATCCTCATCA |
| mdNGS053 | (AGG)5 | TGAAAGGATGTAAGGTAGAATGGA | CTTGGGCTAGTGAAACGCTC |
| mdNGS054 | (AGG)5 | ATCGATGGGTCGAAAATGTC | TCAGATCCGATACTCATCATCA |
| mdNGS055 | (TCC)5 | CACTTTGCAGTCATCGCTCT | GCCCACAAATCGCTACAAGT |
| mdNGS056 | ((TCC)5 | ATCATGCTGCAGTGCTTCAC | GGGTTCCAAGTAGAGGAGGC |
| mdNGS057 | (CCT)5 | GGGTTCCTCCGTCTCTTTCT | TGAAGAACCTGGTGCACATC |
| mdNGS058 | (CCT)6 | CTCTCATTTTCCCCCTCCTC | AAAATTTTGCCGCATTTTGT |
| mdNGS059 | (CCT)5 | TCAAGTCTGATCTTCATCATTGTC | CATTAGGTCGGGGGTGTCTA |
| mdNGS060 | (CCT)6 | CTACATGCCCAATGGGAGTC | ATGATGTTCTTCCTCTGCGG |
| mdNGS061 | (CCT)5 | AGGTCCGATCCTCATCGTC | GATGGACCGGAGGTGTCTAT |
| mdNGS062 | (CTC)6 | TGAATTATCCAATTGTACAAGATAACA | TGAGACACGGAAGACACCAA |
| mdNGS063 | (CTC)5 | GATCAAGGAAGAGGGGGAAG | GGAGGAGTAGAAGGAGGAGAAAA |
| mdNGS064 | (CTC)7 | CTTGCTCTCATTTTCCTCCG | ACGATGATGCCAAATCCAAT |
| mdNGS065 | (CTC)5 | AGCTCCATCAAGGTCTCAGG | TAGTTTCGGATCGGATTTGG |
| mdNGS066 | (CTC)5 | GTGCTCAACGGGACTGATTT | ACCAGCAGGTCAAATTGCTC |
| mdNGS067 | (CTC)5 | TTTTGGAGATGCCAAAAAGG | GATCAAGAGCTCGGAGATGC |
| mdNGS068 | (CTC)7 | GCTCAGCTAGCAATCCCATC | GATGGTCATTGGATCAAGGG |
| mdNGS069 | (CAC)5 | CCGGAAAAGCAAAGACAAAG | GAGGCCATCAATGCTCCTAA |
| mdNGS070 | (CAC)7 | CCTGTTGGCATGAACCTTTT | TGATTTAGTGGTGGTGGTGG |
| mdNGS071 | (CAC)7 | CCTGTTGGCATGAACCTTTT | TGATTTAGTGGTGGTGGTGG |
| mdNGS072 | (GTG)5 | AGCACTTGCGCTGTTTCATA | AGCACGGGATGATTCTGACT |
| mdNGS073 | (GTG)5 | TGATTTTGTGCATGGCTGAT | TCGACATCCTCTGCCTCTCT |
| mdNGS074 | (GTG)5 | CAATCAGATGCTTTTCCTGCT | CTTCGCTCCAACTTCAAAGG |
| mdNGS075 | (TGG)5 | ATGTTGCCGATGTTTGATGA | TGAGCCTACTTTGCCAAACC |
| mdNGS076 | (TGG)6 | CCTGCTCGGATCCAACAATA | AAGCTCTCTGTCCCTGTCCA |
| mdNGS077 | (TGG)6 | TTTCAAGAGAATTGGTGCCC | TGACACTGAAGAACACAAACACC |
| mdNGS078 | (TGG)5 | TGCTCTTCTCCATTGCAACA | AAAACAGAAAGCCATGGGAA |
| mdNGS079 | (AAC)9 | TAGCATGCCAACCCCTAATC | GGCTTCATGGTGGAAGAGAA |
| mdNGS080 | (AAC)6 | TTTTTCCTTTTCTCCCCCAT | TTCCAGCTTCCTTCCAGAAA |
| mdNGS081 | (AAC)5 | TGTGCAGTGCTGTCTCAAAA | AGCAACCCAACCGTTTTCTT |
| mdNGS082 | (AAC)6 | TCCATGATACAACCACTTCTCG | TGCATCCACTAATCATTCGC |
| mdNGS083 | (AAC)5 | CAGTAGAGAAGCGATCCCCA | TTTGACTCCTAGGTTCACAAGTTTT |
| Primer name | Motifs | Forward primer (5'-3') | Reverse primer (5'-3') |
| mdNGS084 | (AAC)5 | TGCTCAATTCAAACCAAGGA | TGCTGTCTGCTTCTTCAGTCA |
| mdNGS085 | (AAC)5 | GGGTTGATGTTGAATGGACC | GGGAGGTTTTTCAACTAACTTCA |
| mdNGS086 | (TTG)5 | GGTGGCCTGTTTGTTTGAAG | TTGTTTTGCAGATCACAGGC |
| mdNGS087 | (TTG)5 | AACCCAATACACATCGCCAG | TCTCAGGGGAGCTCATCAAC |
| mdNGS088 | (TTG)5 | GCACTTTGTGGCAATGTGAT | ATGCGTGGAGGAAGAGAAAA |
| mdNGS089 | (TTG)6 | ATGGAGCCATATCCATTTGC | ATGTCCGGAAGTGCTTGACT |
| mdNGS090 | (TTG)5 | CGACGGAATTTTCCACACAT | AGGCAAGCTGAGGTCTTCAA |
| mdNGS091 | (TTG)5 | CTGGAGGAGCCAGCTTCTTA | TGATGACACTCCCCAACTGA |
| mdNGS092 | (TTG)5 | GGGGAAAGAAGGGGATAACA | CCATCTCCTGGTGGGATTAG |
| mdNGS093 | (TTG)5 | GGCAGTCATGGTCTGCTACA | CTCTAACACCCCTCTTCCCC |
| mdNGS094 | (TTG)5 | AAAGCCTATGGATGGCACTG | TGGCCTATTTCACTCGGTAG |
| mdNGS095 | (TTG)6 | TGTGAAGGGAGAACTCTGTCC | CACCACATCATGTAATTGCCTC |
| mdNGS096 | (TTG)5 | CATTTACCCCCAAAACAACG | ACTCAACTCAACGGGCAAGT |
| mdNGS097 | (TTG)5 | TCCAGTTCCACCAACAATCA | CTTCAAGTTTGTGGGCCATT |
| mdNGS098 | (TTG)7 | ATGGGAATTGTGTGGTCCAT | AGGAAGGCATATAATGAAGCG |
| mdNGS099 | (TTG)5 | ACAAGGAGCCCTTCCAAAAT | CACATTGGTGCAGGTCTTGT |
| mdNGS100 | (TGT)5 | TCTCCCTTGCTCTGTTTTGG | CCCAGCAGGGAAAAGTATCA |
| mdNGS101 | (TGT)5 | CCCTTTTCCTGTCAAGGGAT | ATGCCCAAACAAGTGTGTCA |
| mdNGS102 | (TGT)5 | TGCAGAGACAGCACCAATTC | GCATACGAAACCGTAGCGAT |
| mdNGS103 | (TGT)5 | CGTGAGGCCTATGGGATAGA | TCCTTCCCTCCAACCTTCTT |
| mdNGS104 | (TGT)11 | TTGTTGGTCCCTTATCCTGTG | TTGGTTTCCCCCTAAGGTCT |
| mdNGS105 | (GTT)5 | TGGGCAATAAAGGATGTGGT | TCCAATCAGGAGGTCTCCAC |
| mdNGS106 | (AAG)6 | ACTCATGGCTGTCCATCTCC | AATGTGGCTGTGAGATTGGG |
| mdNGS107 | (AAG)5 | TCTCATGCTGGGATAAAAATAGA | TCATACATTCAAATACCTGATCGAA |
| mdNGS108 | (AAG)5 | CAGATCTGGCAGAGCAATGA | ATGGAAAGCTGCTCCTTCAA |
| mdNGS109 | (AAG)5 | CAGATCTGGCAGAGCAATGA | ATGGAAAGCTGCTCCTTCAA |
| mdNGS110 | (AAG)5 | CGCGGGAAGAAAAGAAAAG | GAGAGAAAGGAGGGAGAGGAA |
| mdNGS111 | (AAG)5 | GAATGTGGCGTGGAGTTTTT | CAGATCGTCCACACGAAGAA |
| mdNGS112 | (AAG)6 | GCTAATGGCTCAACTAGGAGGA | TTATTGTAATTCGTTTACCTGCAA |
| mdNGS113 | (AAG)5 | CACGGGCTTCCTTCAAAATA | TCCTCCTCTAGTGGCCTTCA |
| mdNGS114 | (AAG)5 | ACAGCAGAGGGCACCTTAAA | TTCTTGAGCTTGGCCTCATT |
| mdNGS115 | (AAG)7 | TAGCAATTTGCCACAATCCC | GGTTGTAATGGGGCTATGGT |
| mdNGS116 | (AAG)7 | ATTTGATTTGCCCTTCAAGC | GCTTGGGAGCCTGATAGTTG |
| mdNGS117 | (AAG)8 | CCAATGGAAGGAAGCAAGAA | ACCATTACAAGGCTTGCACC |
| mdNGS118 | (AAG)6 | TGAGAAATGATTGGCAGCAG | ATGTTGGGCACCAAAGTTTC |
| mdNGS119 | (AAG)5 | TCGAAAAGGAAGGAAAAGCTC | TCCAATCACTCATCAAGCTCA |
| mdNGS120 | (AAG)7 | ATTAGTGCATTCCTCGTGGC | TCGGCAAAATAGAAAGAAATTGA |
| mdNGS121 | (AAG)5 | AGCACCAAAAATATGGGACG | TCAATCTCTTCGGGAGTGCT |
| mdNGS122 | (AAG)5 | AGCCAAGTACAAGCATCCTG | TGGAATTGAATTACGCTGGA |
| mdNGS123 | (AAG)6 | GTGTGGGATCAATTGGAAGC | TTTTCCTTACCTTGCTCTTCCTT |
| mdNGS124 | (AAG)6 | CCAATGCAAAGTGGCACTAA | CAAGTCAAAAACCGGCAGAT |
| mdNGS125 | (AAG)8 | TCCACGCACAAATCAGAAAC | ACATGTGGACACATCAGGCT |
| mdNGS126 | (AAG)6 | AGGGCATCAATGGTAAAGCA | TGACAAGCCAAGGGAGTTTC |
| Primer name | Motifs | Forward primer (5'-3') | Reverse primer (5'-3') |
| mdNGS127 | (AAG)5 | GATTTGAGGCAGGTGGAGAG | CATCGCCTGATGTTTACCCT |
| mdNGS128 | (AAG)5 | AAGACCGCCATTTATGACCA | AAAGCACGGATGATTTGACC |
| mdNGS129 | (AAG)7 | TGAAAGTGCAAATCTCGGAA | ACCGATACCAATGCATACCG |
| mdNGS130 | (AAG)5 | TTCGATGATGTGGAATTGGA | TTGGCCTCTTCAGATGTTTG |
| mdNGS131 | (AAG)6 | GATGGGAATATTTGGGATGC | TGCGGACTTCATCTTCTCCT |
| mdNGS132 | (AAG)5 | CATACCTAGGCTTTGGCGAG | AACTCTAGCCCTCCCCCTCT |
| mdNGS133 | (AAG)6 | GGCCCAACACACACACAA | GGTATCGCACGGTCATTCTT |
| mdNGS134 | (AAG)5 | ACAGTTCTGACTGTGGTGCG | ACAGTCGTCAGGTAGGCTGG |
| mdNGS135 | (AAG)7 | CAGCTTCCTTTACCCCAACA | GGTGTGACCTTTCCCTCGTA |
| mdNGS136 | (AAG)6 | GCTCAATGAGATGCTGCTGA | CATCCTGGGCCTTACACAAT |
| mdNGS137 | (AAG)5 | TCCACAGCAGCCAATACATC | TCAACCGGATGATGTGTGTT |
| mdNGS138 | (AAG)5 | ATCAAAATCCGTTTCGACCA | TAATCGGATTGAATGGGCTC |
| mdNGS139 | (AAG)5 | CAAAAGTAGCAAGCACGCAA | TTCAAAGGCCATTTGCATTA |
| mdNGS140 | (AAG)8 | ATTGGATGAAGGCTTGCTTG | CTTCACCTTCTTCCTTCCCC |
| mdNGS141 | (AAG)5 | TGGCTTGCTAGGGTTACTGC | AGCATTCTGCCTGGCTCTTA |
| mdNGS142 | (AAG)9 | GAAGCCGACAAACTACCGAA | AGAGAGAAGAGAGGCAGCCC |
| mdNGS143 | (AAG)5 | TCACATTCTTAACCCCCACC | TTCATGTGAGAGTGGGATTACC |
| mdNGS144 | (AAG)5 | TGTGCACAGACAAACTATGCC | TCTTTTAGGGGCTGTTTGGA |