A consensus linkage map of oil palm and a major QTL for stem height

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Supplementary Figure 1 Genomic sequence of the gene for asparagine synthase-related protein and SNPs detected between a *Dura* and *Pisifera* tree

A. 1197 bp upstream DNA sequence from the start codon of the gene for asparagine synthase of oil palm. Ten SNPs (see letters in red) between the *Dura* and *Pisifera* trees were detected.

TGAGAATTATTATGGGAAAATAATATCTTGAGTTCCACATCGATTGTGAGTYRAGAGAAATTYTGATTTATATGAG
ATCGAAATCTTCTCTCTTTTAGTRAAGTATCTTTTATATAGGATAACATGATGAGATCCAAACYGGCACCTCGATGT
ATTTGAGGTCAAAAAAAAGATAATACCTCATCAAAACAAATATAGAGATTGATCCATCCGATCTATGATCCAAATC
ATCCGAACCCYGATCACAATAAGAATCCATGCAAACGTTGTATTTAATCACTCGTTCAYCRTATAGATATTGAATAT
TTGCACTAAAAAAAGTAGAACAAAATTTTTCATTAATCTAGATAARATTTTAGATTATTATAATTTATAATGGCAAC
AGRTGATTATGAAGTATCGAAGGGTGTTGCAGCTAGGRTTTTAGTATCCAAGATACTATTAGCCTTCTCTATGTTTG
TCTGTTTTGTGTTTCTTTCTCCATCTTGTAAAAATAAAATAAAGGGGCGATTATGGAGACAGTCCCGCAGACAGGG
CAAGGAATCCAAGAGTGCGATTTACCGTCGTCTCCGGAAACGGAGGAGGTTGACGGGGTCTTCTCGGGACGTTA
GGAGAAGGATCGGACCACACATCGTCCGCCAAAAACAACCCCCGAGTGGGACCCACAGTGGTCCTCTTTTTCCTTT
GTTTCGTTTTTCTAATTTAATTTTTGCCCTCTCAAGCTAAAAATATTCCCATCCGCGGGCTGGCAGATGTCGACGTG
GCACCTCGTACACAGAGATATTTTCTTAAACCAGTGGGCGGTAGCGTGGATCCGCGTCAGCGGATAAGTTCTCCAC
AGCGGCCTCCCCTTCGTACCACTGCAGAAACACCGGATCTGGCCCGATTTACGGCCCCCACCCACGAGACCAAGTC
AATTGTGTGACGTAAGGCGTGAACGGTAACCACACCCGGAAGTGTTCATATCTCGCATGTCTGGAATAGCTGCGC
AATTCTAGCATGGGGAATAGGGATCCTTATCCTCCCATCCCTATCCACTTCCACCTCCCAATTGAAAAAATGTACTA
CTATACCACCGGACACAACTATATATACACCTTCCCTATCTCTTGCCAAAACTCCATTCCCCTCCGTTCCCTTTCCTTC
TCCTATTTGCTTTACTTTTCTTGAGTTTTAGACGCAGAGAGAATAGAGAAG-Start codon

B. 1745 bp DNA sequence from the start codon to stop codon of the gene for asparagine synthase-related protein of oil palm. Introns were labeled with green and underlined. Three SNPs in intron 1 and one SNP in exon 2 were detected between the *Dura* and *Pisifera* trees. The SNP in exon 2 did not change amino sequence. A TTC-microsatellite (see letters in pink) in intron 2 showed polymorphism between the *Dura* and *Pisifera* trees.

ATGTTGGCGATATTCCACAAGGCGTTCGCTCACCCGCCCCAGGAGCTCAACAGCCCCGGTGGCGGCCGGCGTGTC
CCCAAGAACCCGGAGGAGATCCTCCGGGAGTTCCACTCCCTCCACCCTGGGGACTCCTTCTCCGCCACCTTCAGCG

GCGGCGCCGCCCTCGCCTGCGTCCCCTCCCACTCCAACCATTCTCCTCAGCAAAGGCACAGCTTTTTTATTCCCATAT
ATTCCAKCTTCCAATTAAGCRTCGCAAATATATGACACCCTCTGTTTTTATTTGGGGKCAGGTTGTTCTGTAGCTTTG
ATGACATATATTGTATGTTCGTGGGGGGACTCGACAACTTGTGCTCTCTTATTAGGCAGTACGGGCTAAGCAAGAA
CACGAACGAGGCTTTGCTTGTGATCGAGGCGTACCGGACGCTGCGCGACCGCGGSCCGTACCCGGCGGACCAGG
TCCTCAAGGACCTCGGCGGCTCCTTCGGCTTCGTGCTCTACGATAGCAAGGCCGGCACCGTCTTCGCTGCGCTGGT
ATAAATTTATTCTCGGTTTATTCCGTTTCTTCTTCTTCTTCTTCTTCTTCGTGGCTGCTGTGGCTGATGGGGAGTT
GTTGTTCTTGTTTTTTGGAATTGGGGTGGGGTGCAGAGCGCGGATGGAAAGATCCCGCTGTTCTGGGGCATCGCC
GCGGATGGATCGGTTGTGATCTGTGATGATGTGGGGATTATAAAAGGAGGCTGCGGCAAATCATACGCTCCTTTC
CCAACTGGTATG:TTTTTTTTTCTAAATCTTATTATTATTATTATTATTTAAGTTTTAGTATATGAATATGCTGTAATTA
GTTTAAGATTTATATGCAAATCTTATTATTATTATTATTATTATGGTTTTTTAAGTTTTAGTATATGAATATGCTG
TAATTAGTTTAAGATTTATATGCAAATCTGTTTTAATTGTAAGAGTATGGAGGGAGGGAAGGAGGAAATTAAGGC
CAAATTAACCTTGATTTTGTTACCATAAATATGGCATATATAATTAATTACTTGATGGAGAACCATGCCCTGTTTGG
TTCCAGCATACTTTTGGTCGGTTAATTTGAATAGGAGGAATAAGTTCGGGGCTAGAACAGAGGGATAAAGCTGAC
AAAGTCTGGATTAAATTATTCAACTATCTTAATCGAAAAAAAATATTCCGATTAAAGAGGATAAGGTACTAAAAAA
AAATTAATCTCAAAAGTATGATCCATTATCTTCATTCCAAAAAAGATGCAGAATTAAACTGAATAAGTCGGTATTTA
ATTATTAATCAATCACCGGCCAGAGGAGTCCCACATGTTAGATCTCGGATCAAATCTAAAACAGAGCCTTCAGTTG
AAGCGAATTGGCATAACATAATTATTGGTAATATGACATGGATGTGATTCATGTGATCGAGTGGTAACACCCCAAG
GGAGATTTGGCAAACTATTATAATTTCCATGAATTTGTTCTTGAGCTCAAATTACAACATCAATGTTATATATTTAAT
GACAATATTGGATACAGGGTGCATGTTCCATAGCGAGGGAGGACTGAAGAGCTTCGAGCATCCCATGAACAAGCT
GAGGCCAATGCCGAGGGTGGATAGCGAGGGGGTGATGTGCGGTGCTAACTTCAAGGTCGACACCTATTCCAGGA
TTAACAGCATGCCACGAGTCGGCAGCGCCACCAACTGGACCTTCTGGGACGAATCCATGTTGTAG

C. 227 bp downstream DNA sequence from the stop codon of the gene for asparagine synthase of oil palm. No SNP was detected between the *Dura* and *Pisifera* trees. A CAA-microsatellite (see letters in pink) showed polymorphism between the *Dura* and *Pisifera* trees

CTTAGCTTTCTACTCTTGGCAACAACAACAACAACAAGAAACCAATCCTATCTTAAGTCTGCCTTTCTTCTGCCT
CATCTTCTTTGTTTAAATGGGTTTCGAGTTCCCTTTGCAGTGTACCTACCATCCATGGAACAAAGGTGTATAGG
TGTCTGGATGTATATTTAGTGTCTACCTTTTATATGTATGGGAAAAAAAACTGACTGCTGAGGCCAGTTATTGA
CTCA

Supplementary Figure 2 Expression of the gene for asparagine synthetase-related protein in leaf (L) and trunk (T) tissues of short and tall trees of oil palm. The expression in the trunk was significantly (P <0.05) higher in short trees than that in tall trees whereas the expression was similar (P>0.05) in leaf in short and tall trees.