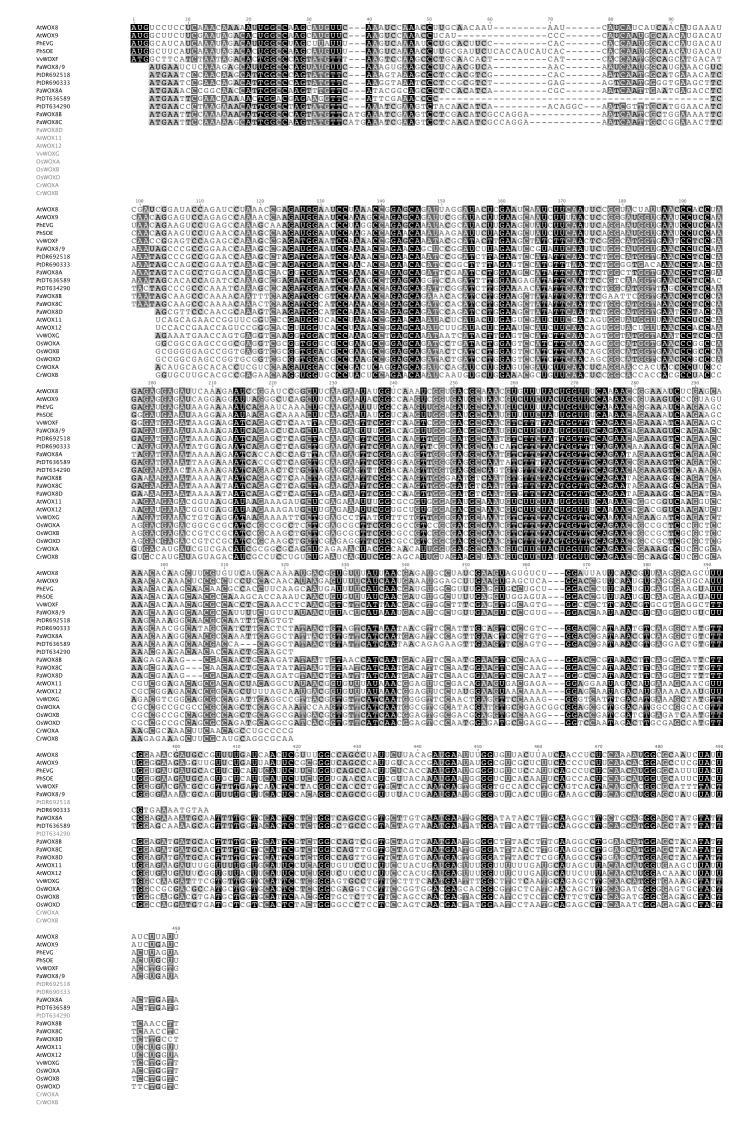**Additional file 2.** Phylogenetic tree of the intermediate clade *WOX* genes including EST sequences from *Pinus taeda* (*Pt*). Analyses were done using the BI method described in the methods sections. Exceptions were: amino acid model used was mixed, and burn-in was 1250. Support values are posterior probabilities DNA data above protein data.

Multiple sequence alignment (nucleotide) with position ruler (1–498).

Row labels (top to bottom):

AtWOX8
AtWOX9
PhEVG
PhSOE
VvWOXF
PaWOX8/9
PtDR692518
PtDR690333
PaWOX8A
PtDT636589
PtDT634290
PaWOX8B
PaWOX8C
PaWOX8D
AtWOX11
AtWOX12
VvWOXG
OsWOXA
OsWOXB
OsWOXD
CrWOXA
CrWOXB

Multiple sequence alignment

Positions 1–95:

```
             1        10        20        30        40        50        60        70        80        90
AtWOX8      MSSSNKNWPSMF-KSKPCNN---N-HHHQHEIDRIPDPKPRWNPKPEQIRILESIFNSGTINPPREEIQRIRIRLQEYGQIGDANVFYWFQNRKSRAK
AtWOX9      MASSNRHWPSMF-KSKPH-----P-HQWQHDINRSPEPKPRWNPKPEQIRILEAIFNSGMVNPPREEIRRIRAQLQEYGQVGDANVFYWFQNRKSRSK
PhEVG       MASSNRHWPSLF-KSKSCTS---H-HQWHHDINRSPEPKQRWNPRPEQIRILEAIFNSGMVNPPRDEIRKIRIKLQEFGQVGDANVFYWFQNRKSRSK
PhSOE       MASSNRHWPSMF-KSKPCDSHHHH-HQWQHDINRSPEPKPRWNPRPEQIRILEAIFNSGMVNPPRDEIRKIRAKLQEYGQVGDANVFYWFQNRKSRSK
VvWOXF      MASSNRHWPSMF-KSKPCNT---H-HQWQHDINRSPEPKPRWNPKPEQIRILEAIFNSGMVNPPRDEIRKIRAQLQEFGQVGDANVFYWFQNRKSRSK
PaWOX8/9    M-NLKEHWPSMF-KVKPSTS---N-NQWHETSNSPPEPKPRWNPKPEQLRILESVFNSGMVNPPRDEIKRIRAQLQEFGQVGDANVFYWFQNRKSRTK
PtDR692518  M-NPNKHWPSMF-KVKPSTS---H-NQWHETSNSPPEPKPRWNPKPEQIRILESIFNSGMVNPPRDEIKRIRAQLQEFGQVGDANVFYWFQNRKSRTK
PaWOX8A     M-KPGNHWPSLF-IRQPSTS---R-NQLNETSNSTPGPKPRWNPKPEQIRILEAIFNSGLVNPPIDEIKRITTQLQEFGEVGEANVFYWFQNRKSRTK
PtDT634290  M-NPKKHWPSMF-KSKSTTS---TGNRLHGTSTSPPKSKPRWNPKPEQIRILENIFNSGMVSPPREELKRIRTLLEEFGQVGEASVFYWFQNRKSKTK
PtDT636589  M-NSNKNWTRRF-IRNP---------------SNSTPDPKPRWNPKPEQVQILEEIFNSVKVNPPRDEIKKITAQLQEFGEVGEANIFYWFQNRKSRSK
PaWOX8B     M-NSKKHWPSMFMKSKSTTS---PGNQSLENSNSKPKTISRWRPKPEQKHILEAIFNSNSVNPPRKEIKIIRAQLEEFGQVGNVNVFYWFQNRKARSK
PaWOX8C     M-NSKKHWPSMFMKSKSTTS---PGNQLPETSNSKPKTNSRWHPKPEQIHILEAIFNSGMVNPPREEIKIIRAQLEEFGQVGDVNVFYWFQNRKARSK
PaWOX8D                            SVPNAKSRWHPKPEQIQILEAIFNSGMVNPTRKEIKIIRAQLEEFGQVGDVNVFYWFQNRKARSK
PtDR690333  M-NPNRHWPSMF-KVNPSAS---E-SQWGEASNSQPESKPRWNPTPEHIRLLESMFNSGVTNPTTEEIWRIRAQLEEFGEVRDASIFYWFQNKKARTK
AtWOX11                            SAEPVRSRWSPKPEQILILESIFHSGMVNPKEETVRIRKMLEKFGAVGDANVFYWFQNRRSRSR
AtWOX12                            STEPVRARWSPKPEQILILESIFNSGTVNPPKDETVRIRKMLEKFGAVGDANVFYWFQNRRSRSR
VvWOXG                             RNEPVRSRWTPKPEQIIILESIFNSGMVNPPKDETVRIRKLLEPYGSVGDANVFYWFQNRRSRSR
OsWOXB                             AGEPVRSRWTPKPEQILILESIFNSGMVNPPKDETVRIRKLLERFGAVGDANVFYWFQNRRSRSR
OsWOXD                             AGEPVRSRWTPKPEQILILESIFNSGMVNPPKDETVRIRKLLERFGAVGDANVFYWFQNRRSRSR
OsWOXA                             GGEPARSRWAPKPEQILILESIFNSGMVNPAKDETARIRRLLERFGAVRDANVFYWFQNRRSRSR
CrWOXA                             TCSTPRPRWTPTQEQIQILESIFNSGTTTPSRDMIVDIAAQLRNYGNIGEANVFYWFQNRKARAK
CrWOXB                             GACTPRTRWCPTPEQINVLETLFNSGTTTPTRAMIVDIASCLNQFGSIVEANVFYWFQNRKARAK
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Positions 96–165:

```
             100       110       120       130       140       150       160    165
AtWOX8      HKLRVHHKMTVFINEMPIEVVS-GLFNVKAAFGNDAVLINSFGQPILTDEFGVTYQPLQNGAIYYLI
AtWOX9      HKLRLLHNIRVFINEMELEVSS-GPFNVRDAFGEEVVLINSAGQPIVTDEYGVALHPLQHGASYYLI
PhEVG       HKQQRHLQAMIFINDVAFEVPA-GPFNVSEVFGDDALLIHSSGQPLLTNEWGVSIQPLQHGAFYYLV
PhSOE       HKQRQSTKSTVFINDVAFEVGV-GPFNVKEVFGEDAVLIHSSGFPLVTNEWGLTIQPLQHGAFYYLL
VvWOXF      HKQRHLQTSTVFINDVAFEVAV-GPFNVREAFGDDAVLINSYGHPVLTNEWGATLQSLQHGAFYYLV
PaWOX8/9    QRQRHFLSITVLINDIAVEVPV-GPINVRAVFGENAVLLHSTGQPVLLNEWGFTLESLQHGAMYYVI
PtDR692518  QRQRQFQC
PaWOX8A     QRQRQIQAITVFINEIPVELPV-GPINLKAVFGENAILLHSSGQPVLVNEWGYTLQGLLQGAMYYLI
PtDT634290  RRQHQLQA
PtDT636589  QKQRP-QAITVFINNREVEVPV-GPINVRTVFGAKAVLVHSSGLPVLVNEYGFTLQGLQHGAIYYLM
PaWOX8B     RKR-QLQDIIVTINDIPMEVPK-GPVNFRAFFGDDALLLHSSGQSVLVNEWGFTFFGLEHGATYFNL
PaWOX8C     RKQ-QLQYISVIINDIPMEVPK-GPINFRALFGDDALLLHSSGQLVLVNEWGFTLEGLEHGATYFNL
PaWOX8D     RKR-QLQDVTVFINDIPTEVPN-GPINFRAFFGDDALLLHSSGQLVLVNEWGFTSEGLEHGATYFLP
PtDR690333  QRHSHLHSITVVINNVPFAVPV-GPINVKAMFVK-------------------------------M
AtWOX11     RRQRQLQAITVFINGVPTEVTR-GGIDMKATFGEDLVLVHSSGVPLPTDEFGFLMHSLQHGEAYFLV
AtWOX12     RRHRQLLAMTVFINGVPMEVTK-GAIDMKTMFGDDSVLLHSSGLPLPTDEFGFLMHSLQHGQTYFLV
VvWOXG      RRQRQIQAVTVFINGVPTEVPK-GSFDMKAMFGQDFVLVHSSGVPVPFNEFGFSMQSLQHGESYFLV
OsWOXB      RRQRQLQAMTVFINGVATEVPR-GPIDLRSMFGQDVMLVHSTGALLPANEYGILLHSLQMGESYFLV
OsWOXD      RRQRQMQAITVFINGVPMEMPR-GPIDLRAMFGQDVMLVHSTGALLPVNDYGILMQSLQIGESYFLV
OsWOXA      RRARQLQQIQVFINGVAYDVPSGGALDMAGTFGRDAMLVHSSGEVLPVDEHGVLINSLQMGECYYLV
CrWOXA      RKLQQPAP
CrWOXB      RKLRMQAQ
```