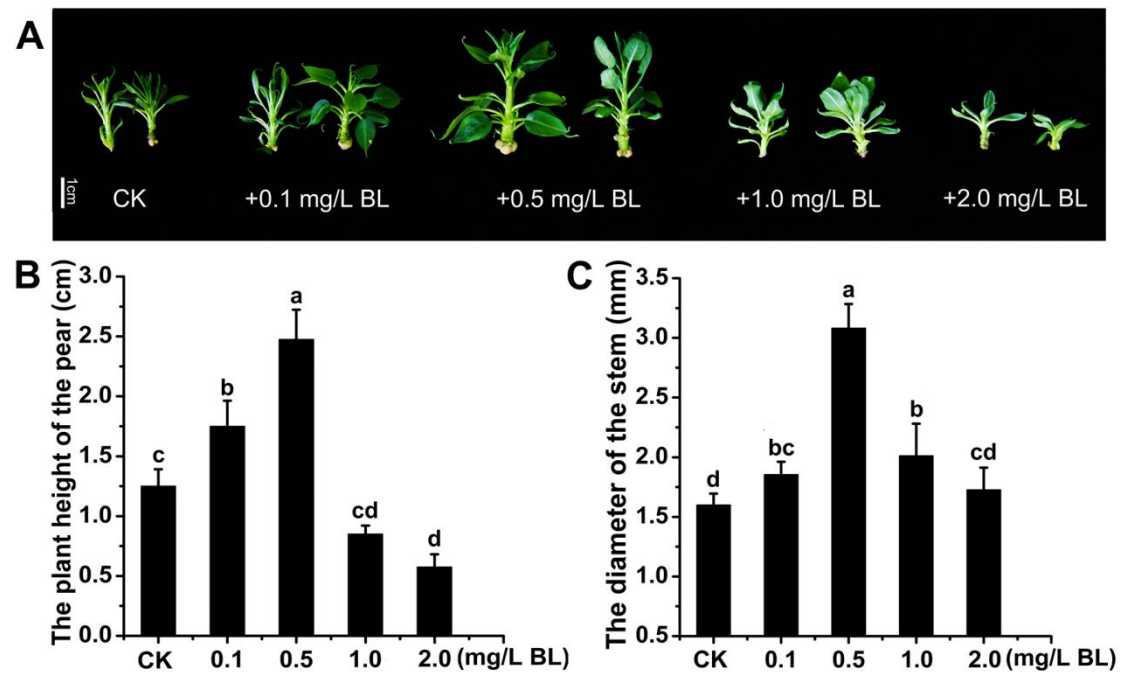
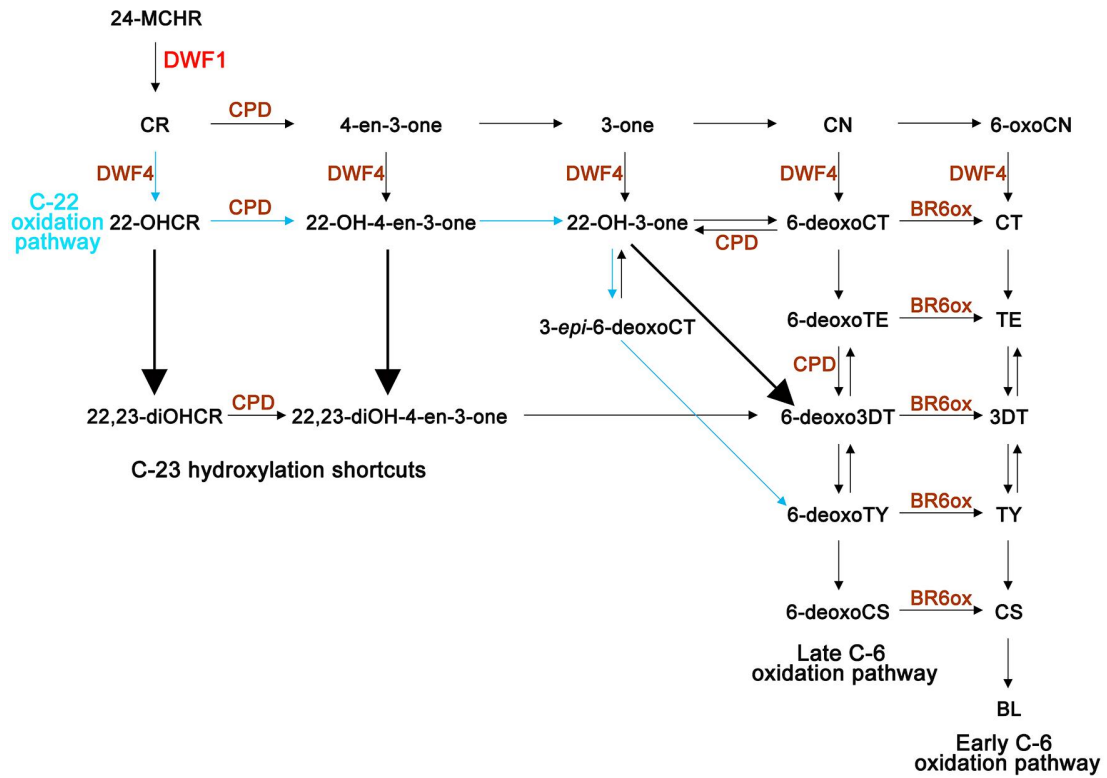


## Additional files

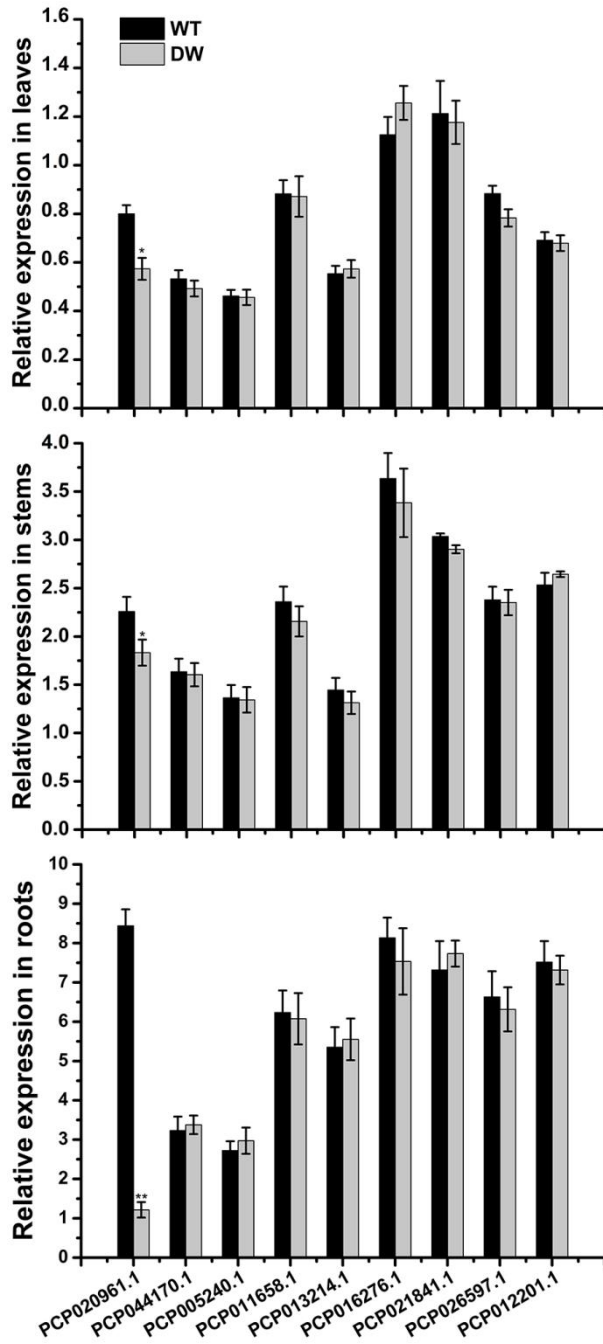
### Additional file 1



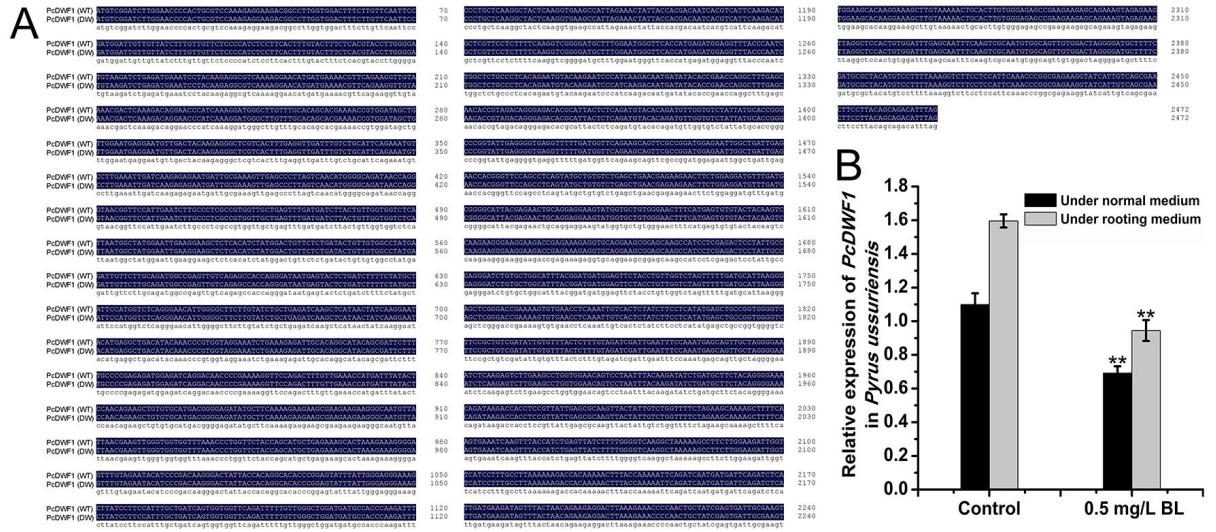
**Figure S1** The effect of different concentrations of BL on the growth of *Pyrus ussuriensis* plants. (A) The phenotypes of *Pyrus ussuriensis* with 0 mg/L, 0.1 mg/L, 0.5 mg/L, 1.0 mg/L, and 2.0 mg/L BL treatment on normal medium for 30 days, respectively. The plant height (B) and the diameter of the stem (C) of *Pyrus ussuriensis* with different concentrations of BL treatment. Data are the means  $\pm$  SD of triplicate experiments. Different lowercase letters indicate significant differences according to Fisher's LSD ( $P < 0.05$ ).



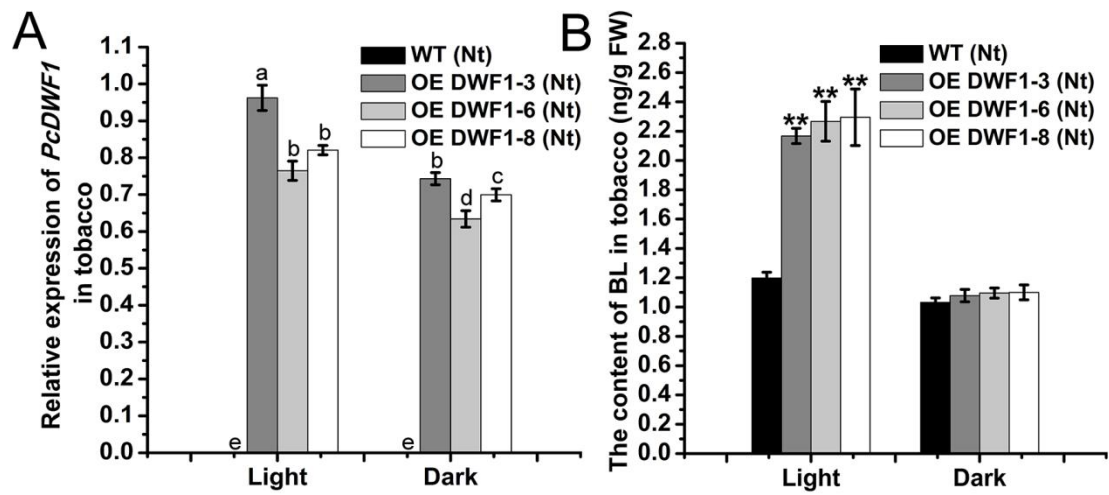
**Figure S2** Simplified brassinosteroid biosynthetic pathway with key rate-limiting enzymes (DWF1, CPD, DWF4, and BR6OX) involved in the reactions.



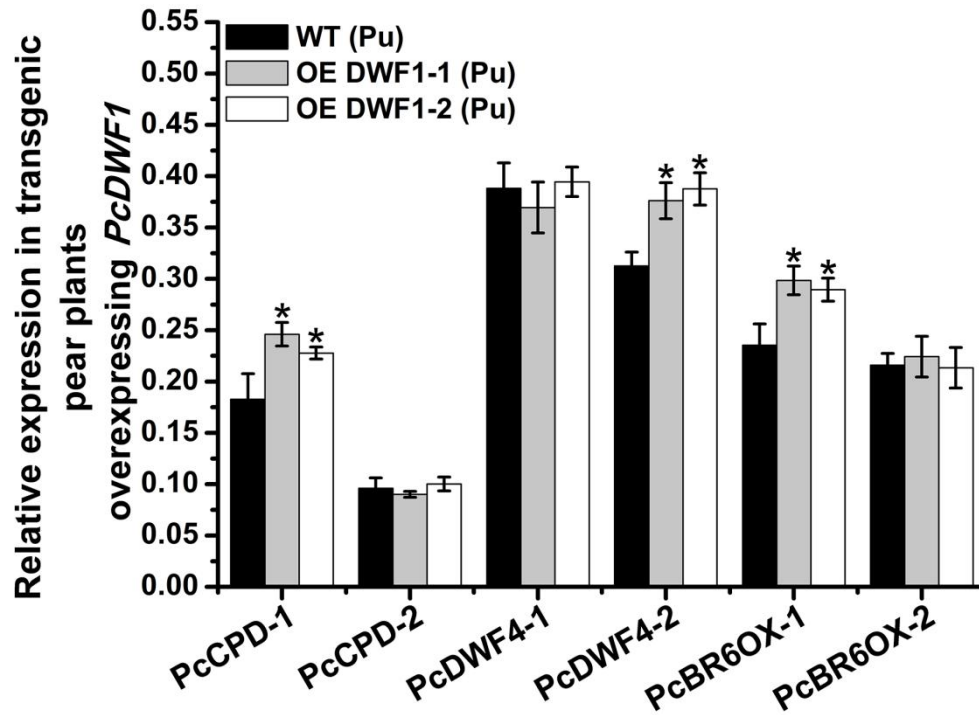
**Figure S3** Relative expression of BR biosynthetic rate-limiting genes (*PCP020961.1*, *PCP044170.1*, *PCP005240.1*, *PCP016276.1*, *PCP021841.1*, *PCP011658.1*, *PCP013214.1*, *PCP026597.1*, and *PCP012201.1*) in leaves, stems, roots of the dwarf-type and standard-type pears. Data are the means  $\pm$  SD of triplicate experiments. Asterisks (\*) indicate significant differences from the control (Student's *t*-test, \**P* < 0.05, \*\**P* < 0.01).



**Figure S4** The CDS sequence alignment of *PcDWF1* and the expression of *PcDWF1* under exogenous BL treatment. (A) The CDS sequence alignment of the *PcDWF1* between the dwarf-type and standard-type pears. (B) Relative expression of *PcDWF1* in *Pyrus ussuriensis* plants with/without exogenous 0.5 mg/L BL treatment. Data are the means  $\pm$  SD of triplicate experiments. Asterisks (\*) indicate significant differences from the control (Student's *t*-test,  $**P < 0.01$ ).



**Figure S5** Relative expression of *PcDWF1* (A) and the content of BL (B) in transgenic lines and wild type tobacco plants under continuous light/dark treatment. Data are the means  $\pm$  SD of triplicate experiments. Different lowercase letters indicate significant differences according to Fisher's LSD ( $P < 0.05$ ). Asterisks (\*) indicate significant differences from the control (Student's *t*-test,  $**P < 0.01$ ).



**Figure S6** Relative expression of *PcCPD-1*, *PcCPD-2*, *PcDWF4-1*, *PcDWF4-2*, *PcBR6OX1-1*, and *PcBR6OX1-2* in transgenic pear lines overexpressing *PcDWF1* and wild type pear plants. Data are the means  $\pm$  SD of triplicate experiments. Asterisks (\*) indicate significant differences from the control (Student's *t*-test,  $*P < 0.05$ ).

## Additional file 2

**Table S1** The primers used for cloning, vector construction and qRT-PCR

Primer name	Forward primer	Reverse primer	Vector
Cloning the CDS of <i>PcDWF1</i>	ATGTCGGATCTTGGAACC CCACTGC	CTAAATGTCTGCTGTAA GGAAGT	
Cloning the promoter of <i>PcDWF1</i>	ACACTCTTATCCTCTTTTA TCTAT	CAAGATCCGACATCTTG AAAGCA	
PcDWF1-GFP	TTAATTAAATGTCGGATC TTGGAACC	GGCGCGCCAAATGTCTG CTGTAAGG	pMDC83
<i>Pro PcDWF1</i> -pMDC83	AAGCTTACACTCTTATCC TCTTTTA	ACTAGTCTTGAAAGCAG AACCCGTG	pMDC83
PcDWF1-pBI121	GGATCCATGTCGGATCTT GGAACCC	CCCGGGAAATGTCTGCT GTAAGG	pBI121
<i>PcActin</i> for qPCR	TGGTGTCAATGGTTGGTAT GG	CAGGAGCAACACGAAG TTCA	
<i>NtActin</i> for qPCR	AGAGGCCCTCAGACAAA C	TAGGTCCAAAGGTCAC AA	
<i>PcDWF1</i> for qPCR	CAACACCGTAGACAGGG AGACA	CCGTAAATGCCAGCACA GATC	
<i>PCP005240.1</i> for qPCR	CGGAGTATTTATTGGGAG GGAAAG	ACCTTGAGTAGCCTTGA GCAGA	
<i>PCP011658.1</i> for qPCR	TCTCCGTTCCCTTGCCTC TATT	TCCCTCCTTTGCCTCAC TATCA	
<i>PCP012201.1</i> for qPCR	CCTAATGAATGAAGCCA AAGGG	GAATGTTGATAACTTGG TTGTCCC	
<i>PCP013214.1</i> for qPCR	CTCTAGTTTCCACCACCT ACCGC	CCAGAGGCTTTGACGA CTTCTTT	
<i>PCP016276.1</i> for qPCR	ATGGAGATGGCAGCAGA ATAAC	TGAGGACAAGGTGGTG GATAAA	
<i>PCP021841.1</i> for qPCR	AAGGATGTTCCGGTACAA AGGGTA	ATGGATTGAAGTGTGTA GGGTG	
<i>PCP026597.1</i> for qPCR	CTGGGACAACCAAGTCA TCAAC	GGTCTCATAACCCGAAT ACAAAA	
<i>PCP044170.1</i> for qPCR	TTTTCTATGCTATTCCGTG GTCT	CCTGTGGTAGTAGTCCC TTGTCCG	