**Figure S1. Growth of Chinese fir clones under Pi-deficiency stress.** (A) The blank and black columns represent the fold change of the plant height and ground-diameter traits under Pi-deficiency treatment compared to Pi-sufficient treatments, respectively. (B-D) The blank and black columns represent the treatments of Pi-deficiency (−P) and Pi-sufficient treatments (+P), respectively. The different letters above the columns indicate statistically significant differences ($p<0.05$) according to a Duncan's test.
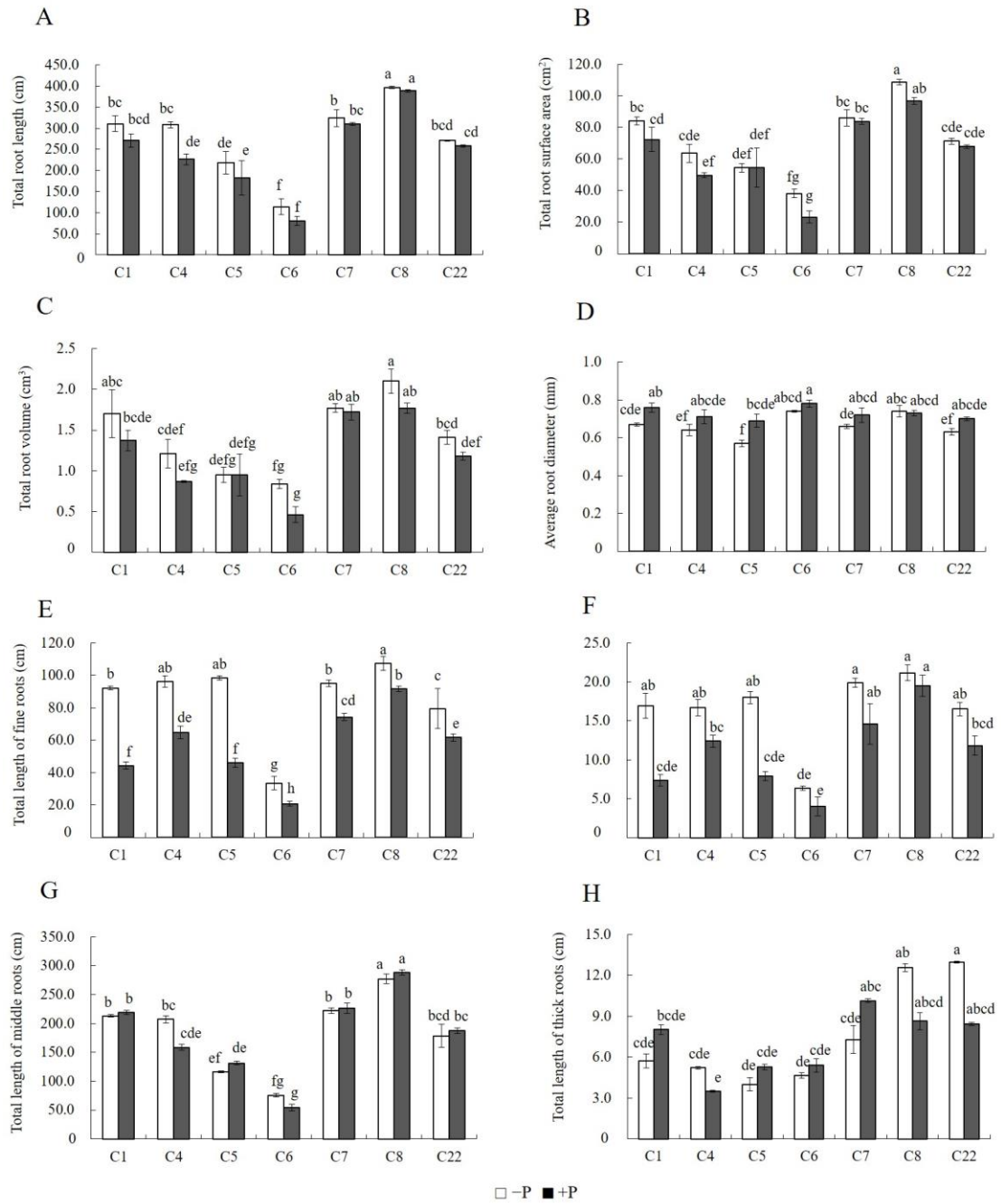
**Figure S2. The root morphology parameters of Chinese fir clones under Pi-deficiency stress.** +P: Pi-sufficient treatments, −P: Pi-deficiency treatments. The different letters above the columns indicate statistically significant differences (*p*<0.05) according to a Duncan's test.
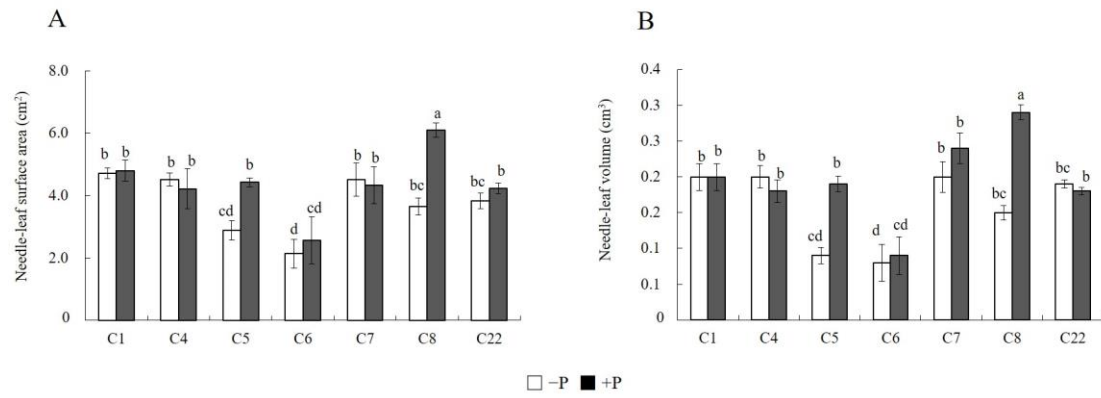
A



B



□ −P  ■ +P

**Figure S3: The needle-leaf morphology parameters of Chinese fir clones under Pi-deficiency stress.** +P: Pi-sufficient treatments, −P: Pi-deficiency treatments. The different letters above the columns indicate statistically significant differences (*p*<0.05) according to a Duncan's test.

**Figure S4: The nutrients content of Chinese fir clones under Pi-deficiency stress.** +P：Pi-sufficient treatments，−P: Pi-deficiency treatments. The different letters above the columns indicate statistically significant differences (*p*<0.05) according to a Duncan's test.
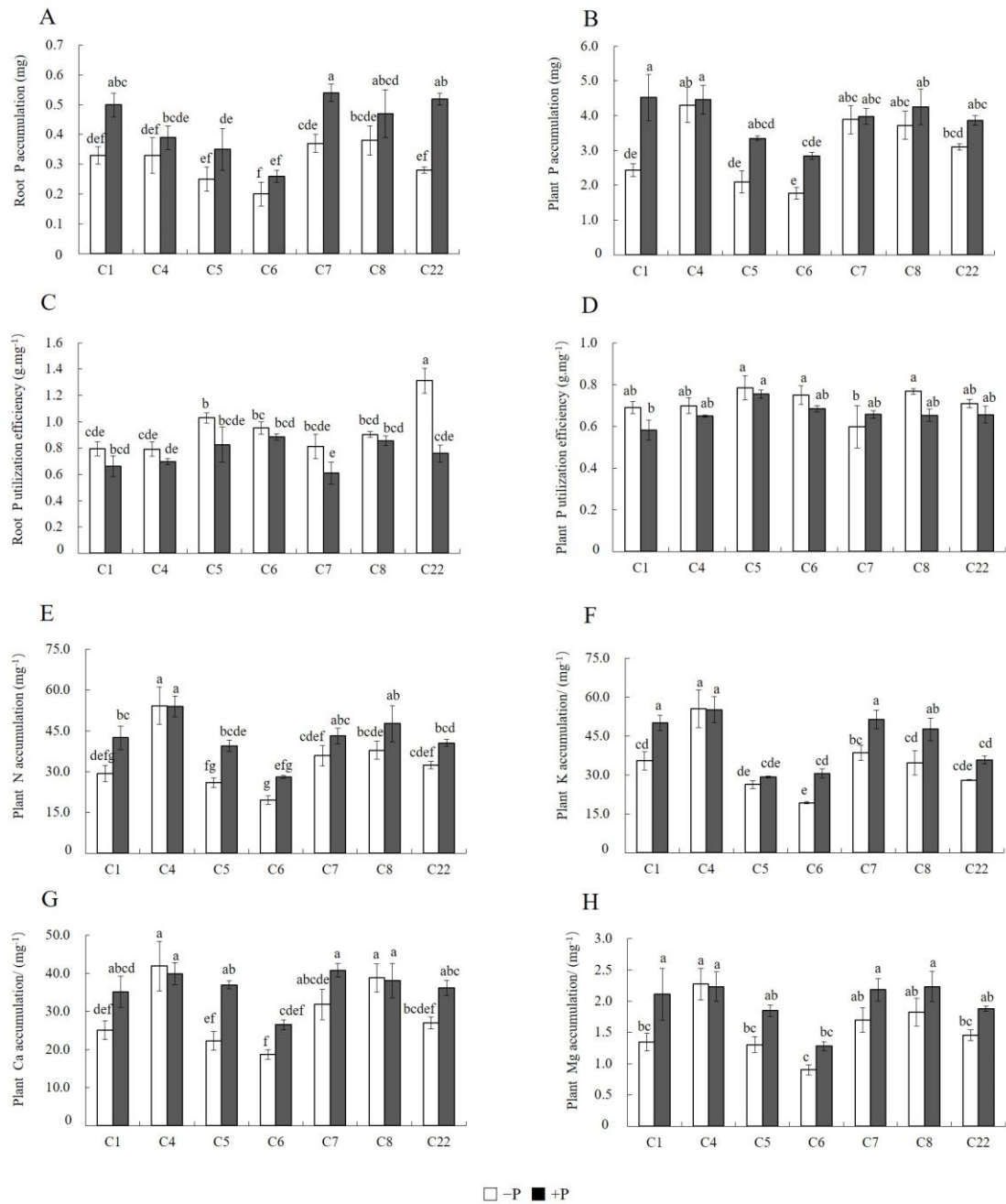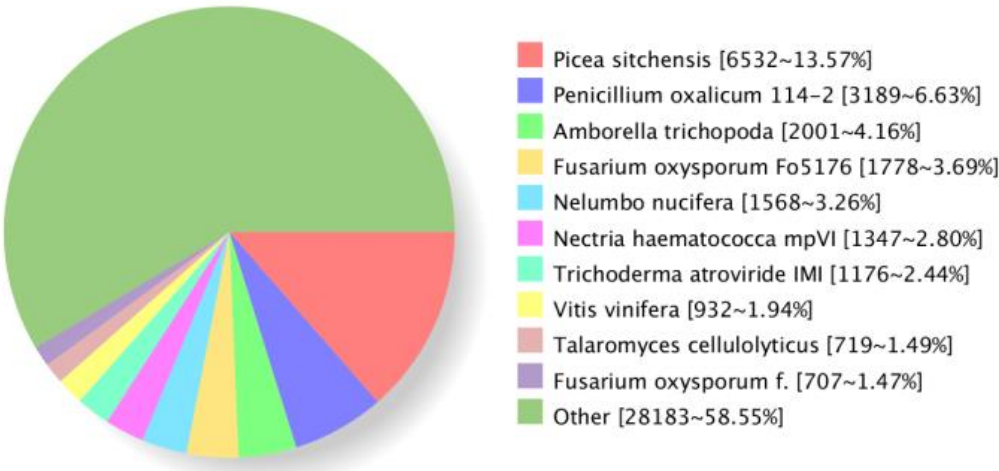
## Nr Homologous Species Distribution



- Picea sitchensis [6532~13.57%]
- Penicillium oxalicum 114-2 [3189~6.63%]
- Amborella trichopoda [2001~4.16%]
- Fusarium oxysporum Fo5176 [1778~3.69%]
- Nelumbo nucifera [1568~3.26%]
- Nectria haematococca mpVI [1347~2.80%]
- Trichoderma atroviride IMI [1176~2.44%]
- Vitis vinifera [932~1.94%]
- Talaromyces cellulolyticus [719~1.49%]
- Fusarium oxysporum f. [707~1.47%]
- Other [28183~58.55%]

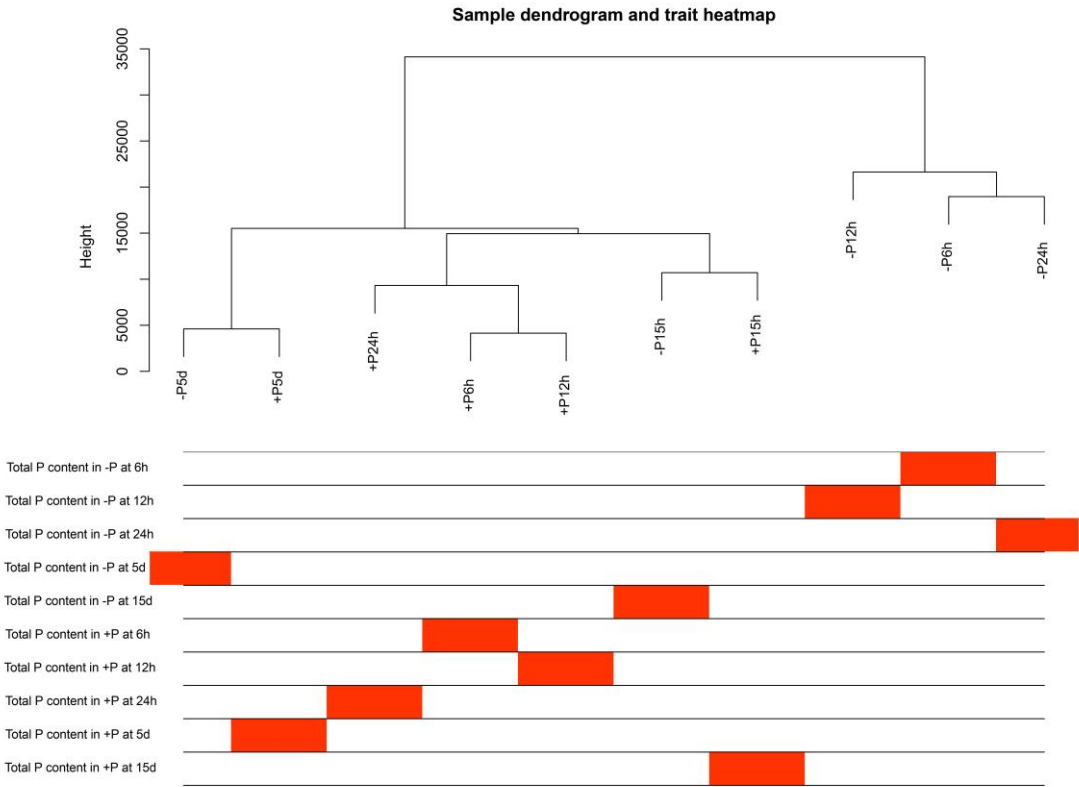**Figure S5. Homologous species distribution in Nr database of clone C5.**



**Figure S6. The trait heatmap in WGCNA.** +P: Pi-sufficient treatments, −P: Pi-deficiency treatments.