

Phylogeography of *Toona ciliata* (Meliaceae) complex in China inferred from cytonuclear markers

Yu Xiao^{1,2}, Xin-Xin Zhang^{1,2}, Ying Hu^{1,2}, Xi Wang^{1,2}, Pei Li^{1,2}, Zi-Han He^{1,2}, Yan-Wen Lv^{1,2},
Xiao-Yang Chen^{1,2} and Xin-Sheng Hu^{1,2*}

1 College of Forestry and Landscape Architecture, South China Agricultural University, Guangzhou
510642, China

2 Guangdong Key Laboratory for Innovative Development and Utilization of Forest Plant
Germplasm, Guangzhou 510642, China

* Correspondence: Xin-Sheng Hu; Email: xinsheng@scau.edu.cn

Running title: Phylogeography of *Toona ciliata*

Table S1. Twenty pairs of primers from mitochondrial DNA tested in *Toona ciliata* complex

| Primer pair | Forward and reverse primer sequences | Annealing temperature | Reference |
|-------------------------|---|-----------------------|--------------------------------------|
| <i>atp9F-atp9R</i> | CCAAGTGAGATGTCCAAGAT CTTCGGTTAGAGCAAAGCC | 50 | Duminil <i>et al.</i> , 2002 |
| <i>ccb203F-ccb203R</i> | ASGTTCTACGGACCAGATGCC CACGGGGAGGGAGCRGGCGA | 56 | Duminil <i>et al.</i> , 2002 |
| <i>ccb206F-ccb206R</i> | TCAATCTTGTTRAACTAATCG CYYCTCCACACCAATCACGA | 62 | Duminil <i>et al.</i> , 2002 |
| <i>ccb256F-ccb256R</i> | GGAAGTTAGCAAAGTTAGAC TTGTTCTAACAGCGATGGC | 56 | Duminil <i>et al.</i> , 2002 |
| <i>cox2/1-cox2/2</i> | TTTCTTCCTCATTCTKATT CCACTCTATTGTCCACTTCTA | 50 | Dumolin-Lapegue <i>et al.</i> , 1997 |
| <i>cox3F-cox3R</i> | CCGTAGGAGGTGTGATGT CTCCCCACCAATAGATAGAG | 58 | Duminil <i>et al.</i> , 2002 |
| <i>orf25F-orf25R</i> | AAGACCRCRAAGCYTCTCG TTGCTGCTATTCTATCTATT | 50 | Duminil <i>et al.</i> , 2002 |
| <i>rpl5F-rpl5R</i> | AGTGGTAAAGTCTCATCT ATYGTGTGAAATAAGAGTAG | 50 | Duminil <i>et al.</i> , 2002 |
| <i>rps4F-rps4R</i> | CSTTCYGCTCCGAAGAG TCTCCGAAGATTGAGG | 58 | Duminil <i>et al.</i> , 2002 |
| <i>rps12-1-nad3-2</i> | TTTCTTCTCTACCATGACGA TGATCCYACTCGGTSTTCCT | 50 | Duminil <i>et al.</i> , 2002 |
| <i>rrn5-rrn18-1</i> | GAGGTCGGAATGGGATCGGG GGGTGAAGTCGTAACAAGGT | 58 | Duminil <i>et al.</i> , 2002 |
| <i>mh44_F-mh44_R</i> | ATGACTGGAAGAATTGCTCAC TTCACTTGATACTCACCCCC | 55 | Duminil <i>et al.</i> , 2002 |
| <i>nad1/B-nad1/C</i> | GCATTACGATCTGCAGCTCA GGAGCTCGATTAGTTCTGC | 57.5 | Demesure <i>et al.</i> , 1995 |
| <i>nad4/1-nad4/2</i> | CAGTGGTTGGTCTGGTATG TCATATGGCTACTGAGGAG | 57.5 | Demesure <i>et al.</i> , 1995 |
| <i>hc_mt1F-hc_mt1R</i> | AGGGTGGCTATTCTCGCTC CGAGAAAGAATAGAATCAAGGG | 52 | This study |
| <i>hc_mt2F-hc_mt2R</i> | TGCTACTGCTGCTACCATGA GCACCAGCAAAGCAAAGCT | 50 | This study |
| <i>hc_F3-hc_R3</i> | AACATAGAACTGAGGTAATG ATTACGCCAAAATGATGCT | 50 | This study |
| <i>26SrRNA-tRNA-Leu</i> | AACATAGAACTGAGGTAATG ATTACGCCAAAATGATGCT | 50 | This study |
| <i>26SrRNA-tRNA-Leu</i> | ACGGATACTTGTCAATTAGA TTTATGTGGTTCCGACTGTA | 50 | This study |
| <i>coxl-nad1</i> | ACAAACAGTTAGTAAGGTCA TTTCCAGTCTCAAATCGGT | 50 | This study |

Table S4. Estimates of parameters of mismatch distribution and statistical tests #

| Population | θ_0 | θ_1 | $\tau(t)$ | SSD (P-value) | Rag (P-value) |
|------------|------------|------------|-----------|---------------|---------------|
| JX | 7.794 | 16.549 | 1.977 | 0.059 (0.20) | 0.121 (0.11) |
| YF | 1.995 | 23.125 | 2.125 | 0.014 (0.44) | 0.042 (0.48) |
| XL | 1.552 | 37.285 | 3.131 | 0.002 (0.84) | 0.013 (0.86) |
| LD | 0.028 | 14.214 | 4.205 | 0.003 (0.94) | 0.020 (0.92) |
| CH | 0.171 | 122.344 | 5.359 | 0.004 (0.51) | 0.020 (0.51) |
| WM | 1.872 | 50.859 | 2.607 | 0.005 (0.53) | 0.023 (0.55) |
| XY | - | - | - | - | - |
| JL | 0.021 | 12.109 | 3.418 | 0.043 (0.07) | 0.136 (0.04) |
| DC | 2.164 | 41.680 | 3.867 | 0.003 (0.69) | 0.010 (0.87) |
| HD | 0.002 | 15.073 | 4.576 | 0.007 (0.61) | 0.023 (0.76) |
| YR | 0.011 | 15.264 | 4.773 | 0.001 (0.95) | 0.010 (0.99) |
| SM | 0.068 | 42.802 | 3.582 | 0.002 (0.90) | 0.022 (0.84) |
| XJ | - | - | - | - | - |
| TL | - | - | - | - | - |

#: SSD: the sum of squared deviation (SSD); Rag: Harpending's raggedness index; $\theta_0=2N_0\mu$, $\theta_1=2N_1\mu$, where N_0 and N_1 are the population sizes before and after population expansion; $\tau(t)$: the time elapsed since a sudden expansion. “-”: appropriate estimates were not derived from sequence data. Populations XJ and TL: Estimates were not available.

Table S2: Five hundred samples of alignment sequences each of which was a concatenated sequence of *cox1-nad1* and *26S-rRNA-tRNA-Leu* segments

Table S3: Four hundred and sixty-seven samples of ITS alignment sequences