**Table S1** Number of homologous genes and blocks within *C. chinensis*, *A. coerulea*, *P. somniferum*, *T. sinense* and *V. vinifera* genomes and between genomes.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Intra/interenomic** | **Block\_lens >4** | **Block\_lens >10** | **Block\_lens >20** | **Block\_lens >50** | **ACP** | **LDB** | **LDB on chromosomes** |
| *C. chinensis* | 1396/8,546 a | 58/1,110 | 16/553 | 2/117 | 6.12,19.14,34.56,58.5 | 59 | Cch5-Cch2 |
| 10240b | 1320 | 624 | 122 |
| *A. coerulea* | 423/3,572 | 66/1,529 | 23/958 | 4/390 | 8.44,23.17,41.65,97.5 | 122 | Aco5-Aco2 |
| 4182 | 1674 | 1043 | 459 |
| *P. somniferum* | 1,041/22,351 | 362/18,197 | 183/15,673 | 103/13,096 | 21.47,50.27,85.64,127.15 | 445 | Pso1-Pso6 |
| 19743 | 17574 | 16350 | 13753 |
| *T. sinense* | 882/24,140 | 272/20,695 | 209/19,698 | 129/17,142 | 27.37,76.08,94.25,132.88 | 487 | Tsi5-Tsi6 |
| 17257 | 15253 | 14,784 | 13,669 |
| *V. vinifera* | 569/6,340 | 140/3,864 | 93/3,195 | 10/629 | 11.14,27.6,34.35,62.9 | 89 | Vvi11-Vvi9 |
| 6078 | 3675 | 3115 | 674 |
| *C. chinensis* *vs*. *A. coerulea* | 729/15,018 | 206/11,866 | 102/10,370 | 47/8,572 | 20.6,57.6,101.67,182.38 | 728 | Cch5-Aco2 |
| 12,828 vs 12,396 | 10,924 vs 10,879 | 9,871 vs 9,815 | 8,383 vs 8,329 |
| *C. chinensis* *vs*.*P. somniferum* | 1,188/14,853 | 420/9,899 | 187/6,529 | 24/1,570 | 12.5,23.57,34.91,65.42 | 128 | Cch6-Pso2 |
| 9,228 vs 12,298 | 6,510 vs 8,981 | 4,617 vs 6,121 | 1,309 vs 1,542 |
| *C. chinensis* *vs*.*T. sinense* | 1,238/18,508 | 456/13,757 | 211/10,145 | 74/5,860 | 14.95,30.17,48.08,79.19 | 290 | Cch5-Tsi8 |
| 11,244 vs 14,675 | 8,612 vs 12,061 | 6,642 vs 9,202 | 4,228 vs 5,500 |
| *C. chinensis* *vs*.*V. vinifera* | 956/12,230 | 303/8,151 | 137/5,741 | 31/2,399 | 12.79,26.9,41.91,77.39 | 206 | Cch5-Vvi5 |
| 9,458 vs 9,596 | 6,710 vs 7,160 | 4,876 vs 5,230 | 2,174 vs 2,312 |
| *A. coerulea vs*.  *C. chinensis*  | 634/14,345 | 209/11,770 | 102/10,261 | 48/8,537 | 22.63,56.32,100.6,177.85 | 718 | Aco2-Cch5 |
| 12,207 vs 12,154 | 10,804 vs 10,805 | 9,713 vs 9,743 | 8,281 vs 8,304 |
| *A. coerulea vs*. *P. somniferum* | 1118/15,669 | 485/11,531 | 192/7,268 | 38/2,570 | 14.02,23.78,37.85,67.63 | 148 | Aco1-Pso7 |
| 9,309 vs 13,106 | 7,293 vs 10,325 | 4,994 vs 6,781 | 2,111 vs 2,566 |
| *A. coerulea vs*. *T. sinense* | 979/18,811 | 439/15,399 | 229/12,388 | 83/7,793 | 19.21,35.08,54.1,93.89 | 362 | Aco2-Tsi8 |
| 11,148 vs 15,354 | 9,440 vs 13,353 | 7,747 vs 10,984 | 5,308 vs 7,142 |
| *A. coerulea vs*. *V. vinifera* | 818/12,665 | 322/9,556 | 152/7,095 | 44/3,597 | 15.48,29.68,46.68,81.75 | 215 | Aco2-Vvi5 |
| 9,793 vs 10,168 | 7,736 vs 8,323 | 5,869 vs 6,352 | 3,209 vs 3,363 |
| *P. somniferum vs*.  *C. chinensis* | 1,351/15,982 | 442/10,287 | 188/6,607 | 25/1,624 | 11.83,23.27,35.14,64.96 | 128 | Pso2-Cch6 |
| 13,001 vs 9,270 | 9,249 vs 6,537 | 6,205 vs 4,613 | 1,596 vs 1,337 |
| *P. somniferum vs*.*A. coerulea* | 1,326/17,020 | 492/11,766 | 195/7,476 | 39/2,684 | 12.84,23.91,38.34,68.82 | 150 | Pso7-Aco1 |
| 14,080 vs 9,646 | 10,504 vs 7,279 | 6,969 vs 5,060 | 2,680 vs 2,220 |
| *P. somniferum vs*.*T. sinense* | 1956/28,033 | 790/20,683 | 372/14,574 | 69/5,246 | 14.33,26.18,39.18,76.03 | 170 | Pso6-Tsi3 |
| 16,214 vs 15,516 | 12,644 vs 12,601 | 9,292 vs 9,624 | 3,831 vs 3,984 |
| *P. somniferum vs*.*V. vinifera* | 1,608/19,214 | 541/12,516 | 231/7,927 | 22/1,634 | 11.95,23.13,34.32,74.27 | 155 | Pso6-Vvi19 |
| 14,249 vs 10,257 | 10094 vs 7,634 | 6545 vs 5,363 | 1475 vs 1,225 |
| *T. sinense vs*.*C. chinensis* | 1,294/18,934 | 468/13,917 | 213/10,181 | 73/5,822 | 14.63,29.74,47.8,79.75 | 294 | Tsi8-Cch5 |
| 15,211 vs 10,867 | 12,229 vs 8,529 | 9,296 vs 6,507 | 5,482 vs 4,101 |
| *T. sinense vs*.*A. coerulea* | 1,128/19,926 | 456/15779 | 229/12,520 | 84/7,946 | 17.66,34.6,54.67,94.6 | 374 | Tsi8-Aco2 |
| 16,134 vs 11,265 | 13,695 vs 9,505 | 11,155 vs 7,719 | 7,324 vs 5,372 |
| *T. sinense vs*.*P. somniferum* | 1,833/27,389 | 792/20,705 | 374/14,573 | 70/5,279 | 14.94,26.14,38.97,75.41 | 174 | Tsi3-Pso6 |
| 15,703 vs 15,500 | 12,754 vs 12,551 | 9,774 vs 9,209 | 4,060 vs 3,833 |
| *T. sinense vs*.*V. vinifera* | 1116/23,671 | 398/19,405 | 278/17,619 | 141/13,196 | 21.21,48.76,63.38,93.59 | 284 | Tsi6-Vvi18 |
| 17,292 vs 12,538 | 15,355 vs 11,239 | 14,060 vs 10,270 | 10,901 vs 8,211 |
| *V. vinifera vs*.*C. chinensis* | 891/11,925 | 306/8,191 | 144/5,862 | 33/2,508 | 13.38,26.77,40.71,76.0 | 205 | Vvi5-Cch5 |
| 9,696 vs 8,972 | 7,228 vs 6,652 | 5,350 vs 4,865 | 2,416 vs 2,227 |
| *V. vinifera vs*.*A. coerulea* | 881/13,125 | 327/9,709 | 151/7,139 | 47/3,778 | 14.9,29.69,47.28,80.38 | 215 | Vvi5-Aco2 |
| 10,595 vs 9,799 | 8,453 vs 7,821 | 6,389 vs 5,859 | 3,547 vs 3,340 |
| *V. vinifera vs*.*P. somniferum* | 1,294/17,200 | 527/12,177 | 222/7,667 | 22/1,623 | 13.29,23.11,34.54,73.77 | 156 | Vvi19-Pso6 |
| 9951 vs 13,039 | 7,585 vs 9,763 | 5,313 vs 6,304 | 1,227 vs 1,458 |
| *V. vinifera vs*.*T. sinense* | 923/22,560 | 401/19,405 | 279/17,570 | 140/13,062 | 24.44,48.39,62.97,93.3 | 287 | Vvi18-Tsi6 |
| 12,766 vs 16,687 | 11,467 vs 15,260 | 10469 vs 13,936 | 8,312 vs 10,765 |

Note: Block\_lens: duplicated gene pairs involved in blocks; ACP: average collinear gene pairs respectively per block; LDB: number of collinear gene pairs reside in the longest duplicated block; aThe slash is preceded by the number of blocks, followed by the number of collinear gene pairs; bDuplicated genes involved in blocks.