*Supplementary Materials*

**Table S1.** Codon-anticodon recognition patterns and codon usage of the cp genome of five *Lepidium* species.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Amino acid | Codon | tRNA | *L. apetalum* | | *L. perfoliatum* | | *L. sativum* | | *L. virginicum* | | *L. meyenii* | |
| Count | RSCU | Count | RSCU | Count | RSCU | Count | RSCU | Count | RSCU |
| Phe | UUU |  | 997 | 1.34 | 1096 | 1.37 | 998 | 1.34 | 1002 | 1.34 | 1020 | 1.34 |
| Phe | UUC | trnF-GAA | 495 | 0.66 | 508 | 0.63 | 493 | 0.66 | 499 | 0.66 | 497 | 0.66 |
| Leu | UUA | trnL-UAA | 864 | 1.85 | 944 | 2.00 | 836 | 1.81 | 864 | 1.84 | 871 | 1.85 |
| Leu | UUG | trnL-CAA | 572 | 1.22 | 534 | 1.13 | 576 | 1.25 | 570 | 1.22 | 567 | 1.21 |
| Leu | CUU |  | 605 | 1.29 | 597 | 1.27 | 614 | 1.33 | 609 | 1.30 | 599 | 1.27 |
| Leu | CUC |  | 178 | 0.38 | 186 | 0.39 | 178 | 0.39 | 180 | 0.38 | 185 | 0.39 |
| Leu | CUA | trnL-UAG | 394 | 0.84 | 395 | 0.84 | 378 | 0.82 | 395 | 0.84 | 401 | 0.85 |
| Leu | CUG |  | 195 | 0.42 | 171 | 0.36 | 191 | 0.41 | 196 | 0.42 | 197 | 0.42 |
| Ile | AUU |  | 1096 | 1.47 | 1155 | 1.51 | 1106 | 1.48 | 1100 | 1.48 | 1102 | 1.48 |
| Ile | AUC | trnI-GAU | 461 | 0.62 | 433 | 0.56 | 467 | 0.63 | 463 | 0.62 | 460 | 0.62 |
| Ile | AUA | trnI-CAU | 675 | 0.91 | 713 | 0.93 | 667 | 0.89 | 669 | 0.90 | 673 | 0.90 |
| Met | AUG | trn(f)M-CAU | 628 | 1.00 | 601 | 1.00 | 619 | 1.00 | 629 | 1.00 | 631 | 1.00 |
| Val | GUU |  | 528 | 1.46 | 528 | 1.48 | 522 | 1.49 | 529 | 1.46 | 540 | 1.49 |
| Val | GUC | trnV-GAC | 179 | 0.49 | 178 | 0.50 | 175 | 0.50 | 180 | 0.50 | 164 | 0.45 |
| Val | GUA | trnV-UAC | 549 | 1.52 | 511 | 1.43 | 517 | 1.47 | 547 | 1.51 | 558 | 1.54 |
| Val | GUG |  | 193 | 0.53 | 209 | 0.59 | 189 | 0.54 | 191 | 0.53 | 190 | 0.52 |
| Tyr | UAU |  | 596 | 1.72 | 797 | 1.63 | 604 | 1.70 | 590 | 1.71 | 598 | 1.75 |
| Tyr | UAC | trnY-GUA | 339 | 0.98 | 178 | 0.37 | 339 | 0.95 | 345 | 1.00 | 340 | 0.99 |
| Stop | UAA |  | 403 | 1.17 | 51 | 1.80 | 421 | 1.19 | 400 | 1.16 | 404 | 1.18 |
| Stop | UAG |  | 199 | 0.58 | 23 | 0.81 | 210 | 0.59 | 202 | 0.58 | 182 | 0.53 |
| Stop | UGA |  | 405 | 1.44 | 11 | 0.39 | 397 | 1.42 | 406 | 1.43 | 424 | 1.50 |
| His | CAU |  | 240 | 0.85 | 466 | 1.51 | 241 | 0.86 | 238 | 0.84 | 226 | 0.80 |
| His | CAC | trnH-GUG | 324 | 1.15 | 150 | 0.49 | 316 | 1.13 | 326 | 1.15 | 314 | 1.11 |
| Gln | CAA | trnQ-UUG | 159 | 0.56 | 728 | 1.56 | 162 | 0.58 | 162 | 0.57 | 169 | 0.60 |
| Gln | CAG |  | 534 | 1.61 | 206 | 0.44 | 527 | 1.59 | 541 | 1.62 | 532 | 1.60 |
| Asn | AAU |  | 249 | 0.75 | 989 | 1.52 | 250 | 0.76 | 250 | 0.75 | 250 | 0.75 |
| Asn | AAC | trnN-GUU | 394 | 1.19 | 312 | 0.48 | 389 | 1.18 | 390 | 1.17 | 402 | 1.21 |
| Lys | AAA | trnK-UUU | 146 | 0.44 | 1160 | 1.54 | 157 | 0.47 | 151 | 0.45 | 146 | 0.44 |
| Lys | AAG |  | 607 | 1.73 | 344 | 0.46 | 567 | 1.70 | 605 | 1.73 | 610 | 1.74 |
| Asp | GAU |  | 233 | 0.67 | 851 | 1.63 | 222 | 0.67 | 236 | 0.67 | 236 | 0.67 |
| Asp | GAC | trnD-GUC | 392 | 1.12 | 193 | 0.37 | 380 | 1.14 | 393 | 1.12 | 394 | 1.12 |
| Glu | GAA | trnE-UUC | 169 | 0.48 | 1058 | 1.53 | 163 | 0.49 | 167 | 0.48 | 162 | 0.46 |
| Glu | GAG |  | 773 | 1.63 | 328 | 0.47 | 774 | 1.60 | 774 | 1.63 | 763 | 1.62 |
| Ser | UCU |  | 178 | 0.37 | 583 | 1.71 | 194 | 0.40 | 175 | 0.37 | 181 | 0.38 |
| Ser | UCC | trnS-GGA | 49 | 1.63 | 313 | 0.92 | 68 | 1.46 | 47 | 1.60 | 48 | 1.66 |
| Ser | UCA | trnS-UGA | 24 | 0.80 | 410 | 1.20 | 34 | 0.73 | 22 | 0.75 | 20 | 0.69 |
| Ser | UCG |  | 483 | 1.54 | 200 | 0.59 | 471 | 1.52 | 482 | 1.53 | 473 | 1.52 |
| Ser | AGU |  | 146 | 0.46 | 410 | 1.20 | 147 | 0.48 | 148 | 0.47 | 150 | 0.48 |
| Ser | AGC | trnS-GCU | 724 | 1.54 | 129 | 0.38 | 710 | 1.54 | 726 | 1.54 | 722 | 1.54 |
| Pro | CCU |  | 215 | 0.46 | 428 | 1.60 | 212 | 0.46 | 217 | 0.46 | 217 | 0.46 |
| Pro | CCC |  | 964 | 1.54 | 199 | 0.74 | 970 | 1.54 | 971 | 1.54 | 962 | 1.52 |
| Pro | CCA | trnP-UGG | 292 | 0.46 | 306 | 1.14 | 293 | 0.46 | 290 | 0.46 | 301 | 0.48 |
| Pro | CCG |  | 1072 | 1.48 | 136 | 0.51 | 1072 | 1.47 | 1068 | 1.48 | 1086 | 1.49 |
| Thr | ACU |  | 376 | 0.52 | 554 | 1.62 | 385 | 0.53 | 375 | 0.52 | 369 | 0.51 |
| Thr | ACC | trnT-GGU | 861 | 1.60 | 237 | 0.69 | 853 | 1.60 | 869 | 1.60 | 866 | 1.61 |
| Thr | ACA | trnT-UGU | 212 | 0.40 | 430 | 1.26 | 214 | 0.40 | 217 | 0.40 | 207 | 0.39 |
| Thr | ACG |  | 1022 | 1.50 | 144 | 0.42 | 995 | 1.49 | 1018 | 1.50 | 1032 | 1.51 |
| Ala | GCU |  | 340 | 0.50 | 637 | 1.85 | 340 | 0.51 | 343 | 0.50 | 335 | 0.49 |
| Ala | GCC |  | 219 | 1.48 | 214 | 0.62 | 245 | 1.36 | 224 | 1.52 | 223 | 1.52 |
| Ala | GCA | trnA-UGC | 76 | 0.52 | 386 | 1.12 | 114 | 0.64 | 70 | 0.48 | 71 | 0.48 |
| Ala | GCG |  | 17 | 0.57 | 143 | 0.41 | 38 | 0.81 | 19 | 0.65 | 19 | 0.66 |
| Cys | UGU |  | 467 | 1.00 | 243 | 1.49 | 465 | 1.00 | 471 | 1.00 | 468 | 1.00 |
| Cys | UGC | trnC-GCA | 340 | 1.27 | 83 | 0.51 | 331 | 1.20 | 342 | 1.28 | 338 | 1.26 |
| Trp | UGG | trnW-CCA | 124 | 0.47 | 456 | 1.00 | 129 | 0.47 | 121 | 0.45 | 122 | 0.45 |
| Arg | CGU | trnR-ACG | 357 | 1.34 | 343 | 1.30 | 357 | 1.29 | 355 | 1.33 | 348 | 1.30 |
| Arg | CGC |  | 130 | 0.49 | 106 | 0.40 | 147 | 0.53 | 131 | 0.49 | 143 | 0.53 |
| Arg | CGA |  | 425 | 1.23 | 372 | 1.41 | 425 | 1.20 | 422 | 1.22 | 412 | 1.20 |
| Arg | CGG |  | 113 | 0.33 | 118 | 0.45 | 132 | 0.37 | 116 | 0.34 | 117 | 0.34 |
| Arg | AGA | trnR-UCU | 489 | 1.83 | 475 | 1.80 | 508 | 1.84 | 491 | 1.84 | 494 | 1.84 |
| Arg | AGG |  | 160 | 0.60 | 173 | 0.65 | 183 | 0.66 | 161 | 0.60 | 164 | 0.61 |
| Gly | GGU |  | 542 | 1.21 | 592 | 1.34 | 511 | 1.16 | 541 | 1.21 | 552 | 1.23 |
| Gly | GGC | trnG-GCC | 194 | 0.43 | 161 | 0.36 | 203 | 0.46 | 192 | 0.43 | 198 | 0.44 |
| Gly | GGA | trnG-UCC | 724 | 1.62 | 732 | 1.66 | 699 | 1.59 | 723 | 1.61 | 715 | 1.6 |
| Gly | GGG |  | 333 | 0.74 | 284 | 0.64 | 342 | 0.78 | 337 | 0.75 | 325 | 0.73 |

**Table S2.** Comparison of 18 intron-containing genes among five *Lepidium* cp genomes.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Gene | Location | *L. apetalum* | *L. perfoliatum* | *L. sativum* | *L. virginicum* | *L. meyenii* |
| Exon I | *trnK-UUU* | LSC | 37 | 37 | 37 | 37 | 37 |
| *trnG-UCC* | LSC | 38 | 38 | 23 | 23 | 23 |
| *trnL-UAA* | LSC | 35 | 35 | 37 | 35 | 35 |
| *trnV-UAC* | LSC | 39 | 39 | 39 | 39 | 39 |
| *trnI-GAU* | IR | 37 | 37 | 42 | 37 | 37 |
| *trnA-UGC* | IR | 38 | 38 | 38 | 38 | 38 |
| *rps16* | LSC | 40 | 40 | 40 | 40 | 40 |
| *rpl16* | LSC | 9 | 9 | 9 | 9 | 9 |
| *rpl2* | IR | 391 | 391 | 390 | 390 | 390 |
| *rpoC1* | LSC | 453 | 453 | 432 | 432 | 432 |
| *ndhA* | SSC | 552 | 552 | 553 | 553 | 553 |
| *ndhB* | IR | 777 | 777 | 723 | 723 | 723 |
| *petB* | LSC | 6 | 6 | 6 | 6 | 6 |
| *petD* | LSC | 8 | 8 | 8 | 8 | 8 |
| *atpF* | LSC | 145 | 145 | 145 | 145 | 145 |
| *ycf3* | LSC | 126 | 126 | 126 | 126 | 126 |
| *clpP* | LSC | 71 | 71 | 71 | 71 | 71 |
| *rps12* | LSC | 114 | 114 | 114 | 114 | 114 |
| Intron I | *trnK-UUU* | LSC | 2552 | 2533 | 2549 | 2529 | 2557 |
| *trnG-UCC* | LSC | 65 | 65 | 718 | 717 | 717 |
| *trnL-UAA* | LSC | 520 | 522 | 518 | 526 | 521 |
| *trnV-UAC* | LSC | 610 | 604 | 600 | 603 | 603 |
| *trnI-GAU* | IR | 947 | 947 | 942 | 947 | 947 |
| *trnA-UGC* | IR | 800 | 800 | 806 | 800 | 800 |
| *rps16* | LSC | 879 | 866 | 877 | 880 | 888 |
| *rpl16* | LSC | 1094 | 1075 | 1101 | 1103 | 1102 |
| *rpl2* | IR | 682 | 682 | 682 | 682 | 682 |
| *rpoC1* | LSC | 784 | 776 | 781 | 783 | 777 |
| *ndhA* | SSC | 1087 | 1089 | 1086 | 1091 | 1076 |
| *ndhB* | IR | 685 | 685 | 685 | 685 | 685 |
| *petB* | LSC | 799 | 793 | 775 | 799 | 799 |
| *petD* | LSC | 726 | 718 | 725 | 731 | 730 |
| *atpF* | LSC | 718 | 735 | 718 | 736 | 717 |
| *ycf3* | LSC | 711 | 719 | 710 | 711 | 718 |
| *clpP* | LSC | 883 | 869 | 884 | 882 | 891 |
| *rps12* | LSC | — | — | — | — | — |
| Exon II | *trnK-UUU* | LSC | 35 | 35 | 35 | 35 | 35 |
| *trnG-UCC* | LSC | 38 | 38 | 49 | 49 | 49 |
| *trnL-UAA* | LSC | 50 | 50 | 50 | 50 | 50 |
| *trnV-UAC* | LSC | 35 | 35 | 37 | 35 | 35 |
| *trnI-GAU* | IR | 35 | 35 | 35 | 35 | 35 |
| *trnA-UGC* | IR | 35 | 35 | 35 | 35 | 35 |
| *rps16* | LSC | 227 | 227 | 227 | 227 | 227 |
| *rpl16* | LSC | 399 | 399 | 399 | 399 | 399 |
| *rpl2* | IR | 434 | 434 | 435 | 435 | 435 |
| *rpoC1* | LSC | 1611 | 1611 | 1611 | 1611 | 1611 |
| *ndhA* | SSC | 531 | 531 | 530 | 530 | 530 |
| *ndhB* | IR | 762 | 762 | 762 | 762 | 762 |
| *petB* | LSC | 642 | 642 | 642 | 642 | 642 |
| *petD* | LSC | 475 | 475 | 475 | 475 | 475 |
| *atpF* | LSC | 410 | 410 | 410 | 410 | 410 |
| *ycf3* | SSC | 228 | 228 | 228 | 228 | 228 |
| *clpP* | LSC | 292 | 292 | 292 | 292 | 292 |
| *rps12* | LSC | 232 | 232 | 232 | 232 | 232 |
| Intron II | *ycf3* | LSC | 792 | 775 | 790 | 791 | 792 |
| *clpP* | LSC | 583 | 575 | 578 | 577 | 571 |
| *rps12* | LSC | 537 | 537 | 537 | 537 | 537 |
| Exon III | *ycf3* | LSC | 153 | 153 | 153 | 153 | 153 |
| *clpP* | LSC | 228 | 228 | 228 | 228 | 228 |
| *rps12* | LSC | 26 | 26 | 26 | 26 | 26 |

**Table S3.** RNA editing sites of the cp genomes of five *Lepidium* species.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Gene | Nucleotide position | |  |  |  | Condon (amino acid) change | Score |
| *L. apetalum* | *L. perfoliatum* | *L. sativum* | *L. virginicum* | *L. meyenii* |  |  |
| *accD* | 742 | 742 | 742 | 742 | 742 | CAT (H) => TAT (Y) | 0.8 |
|  | 782 | 782 | 782 | 782 | 782 | TCG (S) => TTG (L) | 0.8 |
|  | 1391 | 1391 | 1391 | 1391 | 1391 | CCT (P) => CTT (L) | 1 |
| *atpF* | 92 | 92 | 92 | 92 | 92 | CCA (P) => CTA (L) | 0.86 |
| *clpP* | 559 | 559 | 559 | 559 | 559 | CAT (H) => TAT (Y) | 1 |
| *ndhA* | 125 | — | 125 | 125 | 125 | ACA (T) => ATA (I) | 0.8 |
|  | 341 | 341 | 341 | 341 | 341 | TCA (S) => TTA (L) | 1 |
| *matK* | 706 | 640 | 706 | 706 | 706 | CAT (H) => TAT (Y) | 1 |
|  | 1250 | 1184 | 1250 | 1250 | 1250 | TCA (S) => TTA (L) | 0.86 |
|  | — | 1210 | — | — | — | CTT (L) => TTT (F) | 1 |
| *ndhB* | 467 | 467 | 413 | 413 | 413 | CCA (P) => CTA (L) | 1 |
|  | 586 | 586 | 532 | 532 | 532 | CAT (H) => TAT (Y) | 1 |
|  | 611 | 611 | 557 | 557 | 557 | TCA (S) => TTA (L) | 0.8 |
|  | 746 | 746 | 692 | 692 | 692 | TCT (S) => TTT (F) | 1 |
|  | 830 | 830 | 776 | 776 | 776 | TCA (S) => TTA (L) | 1 |
|  | 836 | — | 782 | 782 | 782 | TCA (S) => TTA (L) | 1 |
|  | 1255 | 1255 | 1201 | 1201 | 1201 | CAT (H) => TAT (Y) | 1 |
|  | 1481 | 1481 | 1427 | 1427 | 1427 | CCA (P) => CTA (L) | 1 |
| *ndhD* | 74 | 131 | 74 | 5 | 20 | ACG (T) => ATG (M) | 1 |
|  | 119 | 176 | 119 | 50 | 65 | TCT (S) => TTT (F) | 0.8 |
|  | 455 | 1007 | 455 | 386 | 401 | TCA (S) => TTA (L) | 1 |
|  | 950 | — | 950 | 881 | 896 | TCA (S) => TTA (L) | 1 |
|  | 959 | 1016 | 959 | 890 | 905 | CCC (P) => CTC (L) | 1 |
|  | 1382 | 1439 | 1382 | 1313 | 1328 | TCA (S) => TTA (L) | 0.8 |
|  | 1477 | 1534 | 1477 | 1408 | 1423 | CTT (L) => TTT (F) | 0.8 |
| *ndhF* | 205 | 205 | — | 205 | 205 | CAT (H) => TAT (Y) | 0.8 |
|  | 290 | 290 | 290 | 290 | 290 | TCA (S) => TTA (L) | 1 |
|  | 586 | 586 | 586 | 586 | 586 | CTT (L) => TTT (F) | 0.8 |
|  | 2135 | 2135 | 2135 | 2135 | 2135 | ACA (T) => ATA (I) | 0.8 |
| *ndhG* | 166 | 166 | 166 | 166 | 166 | CAT (H) => TAT (Y) | 0.8 |
|  | 314 | 314 | 314 | 314 | 314 | ACA (T) => ATA (I) | 0.8 |
| *psbE* | 214 | 214 | 214 | 214 | 214 | CCT (P) => TCT (S) | 1 |
| *psbF* | 77 | 77 | 77 | 77 | 77 | TCT (S) => TTT (F) | 1 |
| *rpoB* | 338 | 338 | 338 | 338 | 338 | TCT (S) => TTT (F) | 1 |
|  | 551 | 551 | 551 | 551 | 551 | TCA (S) => TTA (L) | 1 |
|  | 566 | 566 | 566 | 566 | 566 | TCG (S) => TTG (L) | 1 |
|  | 973 | 973 | 973 | 973 | 973 | CTC (L) => TTC (F) | 0.86 |
|  | 2432 | 2432 | 2432 | 2432 | 2432 | TCA (S) => TTA (L) | 0.86 |
| *rpoC1* | 1961 | 1961 | 1940 | 1940 | 1940 | ACT (T) => ATT (I) | 0.86 |
| *rpoC2* | 1628 | — | 1616 | 1616 | 1616 | ACT (T) => ATT (I) | 0.86 |
|  | 2305 | 2305 | 2293 | 2293 | 2293 | CGG (R) => TGG (W) | 1 |
|  | 2354 | 2354 | 2342 | 2342 | 2342 | GCC (A) => GTC (V) | 0.86 |
| *rps14* | 80 | 80 | 80 | 80 | 80 | TCA (S) => TTA (L) | 1 |
|  | 149 | 149 | 149 | 149 | 149 | CCA (P) => CTA (L) | 1 |
| *rps16* | 212 | 212 | 212 | 212 | 212 | TCA (S) => TTA (L) | 0.83 |

**Table S4.** Numbers of SSRs types in five *Lepidium* cp genomes.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Type | Numbers of SSRs types | |  |  |  |
| *L. apetalum* | *L. perfoliatum* | *L. sativum* | *L. virginicum* | *L. meyenii* |
| A | 19 | 21 | 21 | 20 | 27 |
| C | — | 1 | — | — | 1 |
| G | — | 2 | 1 | — | 1 |
| T | 40 | 44 | 42 | 39 | 34 |
| AT | 7 | 10 | 7 | 7 | 8 |
| TA | 7 | 8 | 7 | 8 | 8 |
| AAG | — | — | — | — | 1 |
| AAT | 1 | 1 | 1 | 1 | 1 |
| ATA | 1 | 1 | 1 | 2 | 1 |
| TAC | 1 | — | 1 | 1 | 1 |
| TAT | 1 | 1 | 1 | 1 | 1 |
| TTC | — | 1 | — | — | — |
| AATA | 1 | 1 | — | — | 1 |
| AAAT | 1 | — | 1 | 2 | 1 |
| TATT | — | — | 1 | — | — |
| ATAA | 1 | 1 | 1 | — | 1 |
| ATAG | 1 | 1 | 1 | 1 | 1 |
| CAAA | 1 | 1 | 1 | 1 | 1 |
| GATA | 1 | — | — | 1 | 1 |
| TAAA | 2 | — | 2 | 1 | 2 |
| TAAT | 1 | — | 1 | 1 | 1 |
| TTTA | — | 1 | — | — | — |
| TTTC | 1 | 1 | 1 | 1 | 1 |
| AATAG | — | 1 | — | — | — |
| TAGAC | — | 1 | — | — | — |
| AAATTC | — | — | — | — | 1 |
| TTGTAT | — | — | — | — | 1 |

**Table S5.** Repeated sequences in cp genome.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Species | ID | Repeat Start 1 | Type | Size (bp) | Repeat Start 2 | Gene | Region | Mismatch (bp) | E-value |
| *L. apetalum* | 1 | 166 | P | 60 | 166 | IGS(*trnH*-*GUG*, *psbA*), IGS(*trnH*-*GUG*, *psbA*) | LSC | 0 | 5.07E-27 |
| 2 | 7667 | F | 32 | 34934 | *trnS-GCU*(CDS), *trnS*-*UGA*(CDS) | LSC | -3 | 4.90E-05 |
| 3 | 7669 | P | 30 | 44451 | *trnS*-*GCU*(CDS), *trnS*-*GGA*(CDS) | LSC | -1 | 5.26E-07 |
| 4 | 9251 | P | 41 | 9251 | IGS(*trnG*-*UCC*, *trnR*-*UCU*), IGS(*trnG*-*UCC*, *trnR*-*UCU*) | LSC | -3 | 4.01E-10 |
| 5 | 28254 | P | 30 | 28254 | IGS(*petN*, *psbM*), IGS(*petN*, *psbM*) | LSC | 0 | 5.85E-09 |
| 6 | 34936 | P | 30 | 44451 | *trnS*-*UGA*(CDS), trnS-*GGA*(CDS) | LSC | -3 | 6.41E-04 |
| 7 | 34996 | P | 30 | 44389 | *trnS*-*UGA*(CDS), *trnS*-*GGA*(CDS) | LSC | -2 | 2.29E-05 |
| 8 | 38271 | F | 73 | 40495 | *psaB*(CDS), *psaA*(CDS) | LSC | -3 | 1.27E-28 |
| 9 | 38289 | F | 55 | 40513 | *psaB*(CDS), *psaA*(CDS) | LSC | -2 | 6.94E-20 |
| 10 | 43359 | P | 39 | 140168 | *ycf3*(intron), IGS(*trnV*-*GAC*, *rps7*) | LSC,IRB | -3 | 5.51E-09 |
| 11 | 43359 | F | 39 | 98535 | *ycf3*(intron), IGS(*rps7*, *trnV*-*GAC*) | LSC,IRA | -3 | 5.51E-09 |
| 12 | 43371 | P | 30 | 140165 | *ycf3*(intron), IGS(*trnV*-*GAC*, *rps7*) | LSC,IRB | -2 | 2.29E-05 |
| 13 | 43371 | F | 30 | 98547 | *ycf3*(intron), IGS(*rps7*, *trnV*-*GAC*) | LSC,IRA | -2 | 2.29E-05 |
| 14 | 47580 | F | 31 | 47746 | IGS(*trnL*-*UAA*, *trnF*-*GAA*), IGS(*trnL*-*UAA*, *trnF*-*GAA*) | LSC | -3 | 1.77E-04 |
| 15 | 47601 | F | 51 | 47767 | IGS(*trnL*-*UAA*, *trnF*-*GAA*), IGS(*trnL*-*UAA*, *trnF*-*GAA*) | LSC | -3 | 7.48E-16 |
| 16 | 47604 | F | 63 | 47687 | IGS(*trnL*-*UAA*, *trnF*-*GAA*), IGS(*trnL*-*UAA*, *trnF*-*GAA*) | LSC | -3 | 8.50E-23 |
| 17 | 47612 | F | 50 | 47778 | IGS(*trnL*-*UAA*, *trnF*-*GAA*), *trnF*-*GAA*(CDS) | LSC | -3 | 2.82E-15 |
| 18 | 47613 | F | 62 | 47696 | IGS(*trnL*-*UAA*, *trnF*-*GAA*), IGS(*trnL*-*UAA*, *trnF*-*GAA*) | LSC | -3 | 3.24E-22 |
| 19 | 47625 | F | 37 | 47791 | IGS(*trnL*-*UAA*, *trnF*-*GAA*), *trnF*-*GAA*(CDS) | LSC | -1 | 3.96E-11 |
| 20 | 47631 | F | 48 | 47714 | IGS(*trnL*-*UAA*, *trnF*-*GAA*), IGS(*trnL*-*UAA*, trnF-*GAA*) | LSC | -3 | 3.97E-14 |
| 21 | 47699 | F | 36 | 47782 | IGS(*trnL*-*UAA*, *trnF*-*GAA*), trnF-GAA(CDS) | LSC | -2 | 8.10E-09 |
| 22 | 47708 | F | 37 | 47791 | IGS(trnL-UAA, trnF-GAA), *trnF*-*GAA*(CDS) | LSC | -3 | 7.49E-08 |
| 23 | 73970 | P | 44 | 73970 | IGS(*psbT*, *psbN*), IGS(*psbT*, *psbN*) | LSC | 0 | 2.18E-17 |
| 24 | 88790 | P | 45 | 149883 | *ycf2*(CDS), *ycf2*(CDS) | IRA, IRB | -3 | 2.09E-12 |
| 25 | 88790 | F | 45 | 88814 | *ycf2*(CDS), *ycf2*(CDS) | IRA | -3 | 2.09E-12 |
| 26 | 88814 | P | 45 | 149907 | *ycf2*(CDS), *ycf2*(CDS) | IRA, IRB | -3 | 2.09E-12 |
| 27 | 88836 | P | 32 | 149853 | *ycf2*(CDS), *ycf2*(CDS) | IRA, IRB | -2 | 1.63E-06 |
| 28 | 88836 | F | 32 | 88857 | *ycf2*(CDS), *ycf2*(CDS) | IRA | -2 | 1.63E-06 |
| 29 | 88857 | P | 32 | 149874 | *ycf2*(CDS), *ycf2*(CDS) | IRA, IRB | -2 | 1.63E-06 |
| 30 | 107669 | P | 33 | 131008 | IGS(*rrn4*.5, *rrn5*), IGS(*rrn5*, *rrn4*.5) | IRA, SSC | -2 | 4.34E-07 |
| 31 | 107669 | F | 33 | 107701 | IGS(*rrn4*.5, *rrn5*), IGS(*rrn4*.5, *rrn5*) | IRA | -2 | 4.34E-07 |
| 32 | 107701 | P | 33 | 131040 | IGS(*rrn4*.5, *rrn5*), IGS(*rrn5*, rrn4.5) | IRA, IRB | -2 | 4.34E-07 |
| 33 | 113773 | P | 45 | 113773 | IGS(*rpl32*, *trnL*-UAG), IGS(*rpl32*, *trnL*-*UAG*) | SSC | -3 | 2.09E-12 |
| 34 | 131008 | F | 33 | 131040 | IGS(*rrn5*, *rrn4*.5), IGS(*rrn5*, *rrn4*.5) | IRB | -2 | 4.34E-07 |
| 35 | 149853 | F | 32 | 149874 | *ycf2*(CDS), *ycf2*(CDS) | IRB | -2 | 1.63E-06 |
| 36 | 149883 | F | 45 | 149907 | *ycf2*(CDS), *ycf2*(CDS) | IRB | -3 | 2.09E-12 |
|  |  |  |  |  |  |  |  |  |  |
| *L. perfoliatum* | 1 | 253 | P | 55 | 253 | IGS(*trnH*-*GUG*, *psbA*), IGS(*trnH*-*GUG*, *psbA*) | LSC | -3 | 3.65E-18 |
| 2 | 4620 | F | 30 | 31024 | IGS(matK, *rps16*), IGS(*trnE*-*UUC*, *trnT*-*GGU*) | LSC | -3 | 6.36E-04 |
| 3 | 4620 | F | 32 | 31026 | IGS(*matK*, *rps16*), IGS(*trnE*-*UUC*, *trnT*-*GGU*) | LSC | -3 | 4.86E-05 |
| 4 | 4630 | P | 30 | 31026 | IGS(*matK*, *rps16*), IGS(*trnE*-*UUC*, *trnT*-*GGU*) | LSC | -3 | 6.36E-04 |
| 5 | 7763 | F | 32 | 34964 | *trnS*-*GCU*(CDS), *trnS*-*UGA*(CDS) | LSC | -2 | 1.62E-06 |
| 6 | 7765 | P | 30 | 44453 | *trnS*-*GCU*(CDS), *trnS*-*GGA*(CDS) | LSC | -1 | 5.22E-07 |
| 7 | 7962 | R | 31 | 7962 | IGS(*trnS*-*GCU*, *trnG*-*UCC*), IGS(*trnS*-*GCU*, *trnG*-*UCC*) | LSC | -2 | 6.07E-06 |
| 8 | 8009 | R | 30 | 31020 | IGS(*trnS*-*GCU*, *trnG*-*UCC*), IGS(*trnE*-*UUC*, *trnT*-*GGU*) | LSC | -3 | 6.36E-04 |
| 9 | 9333 | P | 41 | 9333 | IGS(*trnG*-UCC, *trnR*-*UCU*), IGS(*trnG*-UCC, *trnR*-*UCU*) | LSC | -3 | 3.98E-10 |
| 10 | 28360 | P | 40 | 28360 | IGS(*petN*, *psbM*), IGS(*petN*, psbM) | LSC | 0 | 5.54E-15 |
| 11 | 31026 | R | 35 | 31026 | IGS(*trnE*-*UUC*, *trnT*-*GGU*), IGS(*trnE*-*UUC*, *trnT*-*GGU*) | LSC | -2 | 3.04E-08 |
| 12 | 31030 | P | 30 | 31030 | IGS(*trnE*-*UUC*, *trnT*-*GGU*), IGS(*trnE*-*UUC*, *trnT*-*GGU*) | LSC | -2 | 2.27E-05 |
| 13 | 34966 | P | 30 | 44453 | *trnS*-*UGA*(CDS), *trnS*-*GGA*(CDS) | LSC | -3 | 6.36E-04 |
| 14 | 35025 | P | 30 | 44391 | *trnS*-*UGA*(CDS), *trnS*-*GGA*(CDS) | LSC | -2 | 2.27E-05 |
| 15 | 38294 | F | 67 | 40518 | *psaB*(CDS), *psaA*(CDS) | LSC | -3 | 3.98E-25 |
| 16 | 38312 | F | 55 | 40536 | *psaB*(CDS), *psaA*(CDS) | LSC | -3 | 3.65E-18 |
| 17 | 43353 | F | 39 | 98006 | *ycf3*(intron), IGS(*rps7*, *trnV*-*GAC*) | LSC, IRA | -3 | 5.46E-09 |
| 18 | 43353 | P | 39 | 139610 | *ycf3*(intron), IGS(*trnV*-*GAC*, *rps7*) | LSC, IRB | -3 | 5.46E-09 |
| 19 | 43365 | F | 30 | 98018 | *ycf3*(intron), IGS(*rps7*, *trnV*-*GAC*) | LSC, IRA | -2 | 2.27E-05 |
| 20 | 43365 | P | 30 | 139607 | *ycf3*(intron), IGS(*trnV*-*GAC*, rps7) | LSC, IRB | -2 | 2.27E-05 |
| 21 | 47008 | P | 32 | 47008 | *trnL*-*UAA*(intron), *trnL*-*UAA*(intron) | LSC | 0 | 3.63E-10 |
| 22 | 47611 | F | 34 | 47802 | IGS(*trnL*-*UAA*, *trnF*-*GAA*), *trnF*-*GAA*(CDS) | LSC | -1 | 2.31E-09 |
| 23 | 47614 | F | 32 | 47652 | IGS(*trnL*-*UAA*, *trnF*-*GAA*), IGS(*trnL*-*UAA*, *trnF*-*GAA*) | LSC | 0 | 3.63E-10 |
| 24 | 47647 | F | 46 | 47800 | IGS(*trnL*-*UAA*, *trnF*-*GAA*), *trnF*-*GAA*(CDS) | LSC | -3 | 5.54E-13 |
| 25 | 47668 | P | 30 | 47717 | IGS(*trnL*-*UAA*, *trnF*-*GAA*), IGS(*trnL*-*UAA*, *trnF*-*GAA*) | LSC | -3 | 6.36E-04 |
| 26 | 73420 | P | 44 | 73420 | IGS(*psbT*, *psbN*), IGS(*psbT*, *psbN*) | LSC | -2 | 1.84E-13 |
| 27 | 88307 | F | 32 | 88328 | *ycf2*(CDS), *ycf2*(CDS) | IRA | -2 | 1.62E-06 |
| 28 | 88307 | P | 32 | 149295 | *ycf2*(CDS), *ycf2*(CDS) | IRA, IRB | -2 | 1.62E-06 |
| 29 | 88328 | P | 32 | 149316 | *ycf2*(CDS), *ycf2*(CDS) | IRA, IRB | -2 | 1.62E-06 |
| 30 | 98009 | F | 37 | 120065 | IGS(*rps7*, *trnV*-*GAC*), *ndhA*(intron) | IRA, SSC | -3 | 7.43E-08 |
| 31 | 107141 | F | 33 | 107173 | IGS(*rrn4*.5, *rrn5*), IGS(*rrn4*.5, *rrn5*) | IRA | -2 | 4.31E-07 |
| 32 | 107141 | P | 33 | 130449 | IGS(*rrn4*.5, *rrn5*), IGS(*rrn5*, rrn4.5) | IRA, IRB | -2 | 4.31E-07 |
| 33 | 107173 | P | 33 | 130481 | IGS(*rrn4*.5, *rrn5*), IGS(*rrn5*, rrn4.5) | IRA, IRB | -2 | 4.31E-07 |
| 34 | 112275 | R | 32 | 123852 | IGS(*ndhF*, *rpl32*), ycf1(CDS) | SSC | -3 | 4.86E-05 |
| 35 | 113209 | P | 45 | 113209 | IGS(*rpl32*, *trnL*-*UAG*), IGS(*rpl32*, *trnL*-*UAG*) | SSC | -3 | 2.07E-12 |
| 36 | 118852 | P | 37 | 118852 | IGS(*ndhG*, *ndhI*), IGS(*ndhG*, *ndhI*) | SSC | -1 | 3.93E-11 |
| 37 | 120065 | P | 37 | 139609 | *ndhA*(intron), IGS(*trnV*-*GAC*, *rps7*) | SSC, IRB | -3 | 7.43E-08 |
| 38 | 130449 | F | 33 | 130481 | IGS(*rrn5*, rrn4.5), IGS(*rrn5*, rrn4.5) | IRB | -2 | 4.31E-07 |
| 39 | 149295 | F | 32 | 149316 | *ycf2*(CDS), *ycf2*(CDS) | IRB | -2 | 1.62E-06 |

**Table S6.**Tandem repeat sequence of *L. apetalum* and *L. perfoliatum*.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Species | ID | Size (bp) | Copy number | Location | Repeat unit |
| *L. apetalum* | 1 | 12 | 2.2 | *ndhA* | TTTTTTAACTTA |
|  | 2 | 13 | 4.5 | IGS(*psbZ, trnG-GCC*) | AATATTAATATAT |
|  | 3 | 14 | 2.2 | IGS(*matK*, *rps16*) | ATATATAATTTTAT |
|  | 4 | 15 | 1.9 | IGS(*trnT*-*GGU*, *psbD*) | AATTTCATTCTAATT |
|  | 5 | 15 | 2 | IGS(*trnT*-*GGU*, *psbD*) | ATATATAACATTAAG |
|  | 6 | 15 | 2.3 | IGS(*psbE*, *petL*) | TATTATTTTTTTATG |
|  | 7 | 15 | 2.3 | IGS(*clpP*, *psbB*) | TTAAATTAATCATAT |
|  | 8 | 17 | 2 | IGS(*psbM*, *trnD*-*GUC*) | AAAAAGAAAAATAAAAC |
|  | 9 | 17 | 1.9 | IGS(*psbZ*, *trnG*-*GCC*) | AATTCAATATTCAATAA |
|  | 10 | 17 | 2.7 | IGS(*petA*, *psbJ*) | TTTAATATATATAACTG |
|  | 11 | 18 | 3.4 | ycf2 | TATTGATGCTAGTAACGA |
|  | 12 | 18 | 1.9 | IGS (*rps7*, *trnV*-*GAC*) | ATTTTCTATTATATTAGG |
|  | 13 | 18 | 1.9 | IGS(*trnV*-*GAC*, *rps7*) | CTAATAGAATAGAAAATC |
|  | 14 | 18 | 2.6 | ycf2 | ATCAATATCGTCACTAGC |
|  | 15 | 18 | 3.4 | ycf2 | ATCAATATCGTTACTAGC |
|  | 16 | 19 | 2.1 | IGS(*psbA*, *trnK*-*UUU*) | TAGAAAATATAAATAAAAT |
|  | 17 | 20 | 2 | rpl2 | TCTTATATATATCGTAGAAT |
|  | 18 | 20 | 2 | rpl2 | TTCTACCATATATAGAAGAA |
|  | 19 | 21 | 4.2 | ycf2 | TTTTTGTCCAAGTTACTTCTT |
|  | 20 | 21 | 4.3 | ycf2 | AAAAAGAGAAGTAACTTGGAC |
|  | 21 | 22 | 2 | IGS(*ndhF*, *rpl32*) | AAATAAAAAAAAGTAAAAAACC |
|  | 22 | 24 | 2.3 | IGS(*psbZ*, *trnG*-*GCC*) | AATATTAATATATAGAATAAATAT |
|  | 23 | 24 | 4.3 | ycf2 | TTTGTCTAAGTCACTTCGTTTCTT |
|  | 24 | 24 | 5.1 | ycf2 | AAAAAGAAACGAAGTGACTTAGAC |
|  | 25 | 24 | 3.7 | ycf2 | GAAGTAACTTGGACAAAAAGAAAC |
|  | 26 | 25 | 2.1 | IGS(*accD*, *psaI*) | TATTTATATTAGGTTCTATTCTAGA |
|  | 27 | 32 | 1.9 | IGS (*rrn4*.5, *rrn5*) | GTTCAACTCTTTGACAACACGAAAAAACCATT |
|  | 28 | 32 | 1.9 | IGS (*rrn4*.5, *rrn5*) | GGTTTTTTCATGTTGTCAAAGAGTTGAACAAT |
|  | 29 | 42 | 2.6 | *ycf2* | TTTGTCTAAGTCACTTCTTTTTTTGTCCAAGTTACTTCTTCT |
|  | 30 | 83 | 3 | *trnF*-*GAA* | TAGTACAATGAGAATGATACTTCGGTAATGGTCGGCATAGCTCACTTGGTAGAGCAGAGGACTGAAAATCCTTGTGTCACCAT |
|  |  |  |  |  |  |
| *L. perfoliatum* | 1 | 2 | 18.5 | IGS(*trnS*-*GCU*, *trnG*-*UCC*) | TA |
|  | 2 | 2 | 18.5 | IGS(*trnE*-*UUC*, *trnT*-GGU) | TA |
|  | 3 | 13 | 7.2 | IGS(*trnS*-*GCU*, *trnG*-UCC) | TTTATATATATAT |
|  | 4 | 13 | 3.2 | IGS(*psbZ*, *trnG*-*GCC*) | ATATAATATTAAT |
|  | 5 | 13 | 2.8 | IGS(*ndhC*, *trnV*-UAC) | TCTAGATATATCG |
|  | 6 | 15 | 2.6 | IGS(*trnS*-*GCU*, *trnG*-*UCC*) | TATATATATATATAT |
|  | 7 | 15 | 2 | IGS(*trnT*-*GGU*, *psbD*) | ATATATAACATTAAG |
|  | 8 | 15 | 2.3 | IGS(*clpP*, *psbB*) | TTAATTTAATCATAT |
|  | 9 | 16 | 2 | IGS(*trnC*-*GCA*, *petN*) | ATACAGACTAATGAAA |
|  | 10 | 17 | 3.8 | IGS(*trnS*-*GCU*, *trnG*-*UCC*) | TATATATATATATTTAT |
|  | 11 | 17 | 2.1 | *atpF* | TTTTTTATTAGACTACA |
|  | 12 | 17 | 2.7 | IGS(*petA*, *psbJ*) | TTTAATATATATAACTG |
|  | 13 | 18 | 3.4 | *ycf1* | TATTGATGATAGTACGAT |
|  | 14 | 18 | 2.6 | *ycf2* | ATCAATATCGTCACTAGC |
|  | 15 | 18 | 3.4 | *ycf2* |  |
|  | 16 | 20 | 2 | *rpl2* | TCTTATATATATCGTAGAAT |
|  | 17 | 20 | 2 | *rpl2* | TTCTACCATATATAGAAGAA |
|  | 18 | 21 | 3.2 | *ycf2* | TTTTTGTCCAAGTTACTTCTT |
|  | 19 | 21 | 4.1 | *ycf2* | AAAAAGAGAAGTAACTTAGAC |
|  | 20 | 32 | 1.9 | IGS (*rrn4*.5, *rrn5*) | GTTCAACTCTTTGACAACACGAAAAAACCATT |
|  | 21 | 32 | 1.9 | IGS (*rrn4*.5,*rrn5*) | GGTTTTTTCATGTTGTCAAAGAGTTGAACAAT |

**Table S7.** SNP number in 78 genes of the cp genomes of five *Lepidium* species.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Gene name | SNP number | Gene name | SNP number | Gene name | SNP number | Gene name | SNP number |
| *accD* | 31 | *ndhJ* | 7 | *psbI* | 2 | *rpoC1* | 16 |
| *atpA* | 23 | *ndhK* | 5 | *psbJ* | 2 | *rpoC2* | 73 |
| *atpB* | 16 | *petA* | 10 | *psbK* | 2 | *rps11* | 10 |
| *atpE* | 2 | *petB* | 2 | *psbL* | 0 | *rps12* | 1 |
| *atpF* | 12 | *petD* | 5 | *psbM* | 2 | *rps14* | 6 |
| *atpH* | 0 | *petG* | 1 | *psbN* | 0 | *rps15* | 4 |
| *atpI* | 9 | *petL* | 4 | *psbT* | 1 | *rps16* | 8 |
| *ccsA* | 37 | *petN* | 0 | *psbZ* | 1 | *rps18* | 1 |
| *cemA* | 6 | *psaA* | 13 | *rbcL* | 29 | *rps19* | 5 |
| *clpP* | 7 | *psaB* | 28 | *rpl14* | 3 | *rps2* | 7 |
| *matK* | 56 | *psaC* | 5 | *rpl16* | 5 | *rps3* | 16 |
| *ndhA* | 16 | *psaI* | 1 | *rpl2* | 3 | *rps4* | 7 |
| *ndhB* | 4 | *psaJ* | 2 | *rpl20* | 5 | *rps7* | 0 |
| *ndhC* | 7 | *psbA* | 5 | *rpl22* | 9 | *rps8* | 7 |
| *ndhD* | 29 | *psbB* | 29 | *rpl23* | 1 | *ycf1* | 303 |
| *ndhE* | 4 | *psbC* | 14 | *rpl32* | 4 | *ycf2* | 29 |
| *ndhF* | 57 | *psbD* | 8 | *rpl33* | 3 | *ycf3* | 2 |
| *ndhG* | 6 | *psbE* | 2 | *rpl36* | 1 | *ycf4* | 6 |
| *ndhH* | 14 | *psbF* | 1 | *rpoA* | 14 |  |  |
| *ndhI* | 9 | *psbH* | 4 | *rpoB* | 40 |  |  |

**Table S8.** Table S8 Nucleotide diversity in five *Lepidium* chloroplast genomes, annotated based on *L. apetalum* regions.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Midpoint | Pi | Region | Midpoint | Pi | Region | Midpoint | Pi | Region |
| 505 | 0.01125 | LSC | 52857 | 0.00675 | LSC | 105035 | 0 | IR |
| 705 | 0.00525 | LSC | 53057 | 0.00575 | LSC | 105235 | 0.0005 | IR |
| 905 | 0.0015 | LSC | 53257 | 0.00525 | LSC | 105435 | 0.001 | IR |
| 1105 | 0.002 | LSC | 53457 | 0.0025 | LSC | 105641 | 0.0015 | IR |
| 1305 | 0.00525 | LSC | 53657 | 0.0025 | LSC | 105841 | 0.0015 | IR |
| 1505 | 0.00725 | LSC | 53857 | 0.00225 | LSC | 106041 | 0.002 | IR |
| 1765 | 0.01013 | LSC | 54057 | 0.00275 | LSC | 106241 | 0.0015 | IR |
| 1999 | 0.014 | LSC | 54257 | 0.00425 | LSC | 106441 | 0.001 | IR |
| 2199 | 0.01625 | LSC | 54457 | 0.00625 | LSC | 106641 | 0.0015 | IR |
| 2399 | 0.016 | LSC | 54657 | 0.0105 | LSC | 106841 | 0.0005 | IR |
| 2599 | 0.01663 | LSC | 54864 | 0.01613 | LSC | 107041 | 0.0005 | IR |
| 2799 | 0.01525 | LSC | 55085 | 0.01713 | LSC | 107241 | 0.0005 | IR |
| 2999 | 0.01475 | LSC | 55299 | 0.01463 | LSC | 107441 | 0 | IR |
| 3199 | 0.016 | LSC | 55502 | 0.00962 | LSC | 107641 | 0 | IR |
| 3399 | 0.017 | LSC | 55702 | 0.0045 | LSC | 107841 | 0.0005 | IR |
| 3599 | 0.0145 | LSC | 55902 | 0.005 | LSC | 108041 | 0.0005 | IR |
| 3799 | 0.01325 | LSC | 56102 | 0.0055 | LSC | 108241 | 0.0005 | IR |
| 4001 | 0.01125 | LSC | 56302 | 0.0075 | LSC | 108441 | 0.001 | IR |
| 4209 | 0.01513 | LSC | 56502 | 0.00925 | LSC | 108641 | 0.0005 | IR |
| 4410 | 0.02313 | LSC | 56702 | 0.0085 | LSC | 108841 | 0.0005 | IR |
| 4629 | 0.02338 | LSC | 56902 | 0.0125 | LSC | 109047 | 0.001 | IR |
| 4909 | 0.02538 | LSC | 57125 | 0.0135 | LSC | 109252 | 0.0005 | IR |
| 5109 | 0.0205 | LSC | 57343 | 0.01225 | LSC | 109456 | 0.00375 | IR |
| 5309 | 0.0165 | LSC | 57554 | 0.012 | LSC | 109675 | 0.00425 | IR |
| 5512 | 0.0155 | LSC | 57754 | 0.0105 | LSC | 109891 | 0.00375 | IR |
| 5716 | 0.019 | LSC | 57954 | 0.008 | LSC | 110102 | 0.00475 | IR |
| 5927 | 0.0175 | LSC | 58154 | 0.008 | LSC | 110303 | 0.0015 | IR |
| 6133 | 0.017 | LSC | 58354 | 0.008 | LSC | 110503 | 0.001 | SSR |
| 6344 | 0.01925 | LSC | 58554 | 0.0075 | LSC | 110709 | 0.0015 | SSR |
| 6557 | 0.01713 | LSC | 58754 | 0.0085 | LSC | 110909 | 0.0005 | SSR |
| 6758 | 0.017 | LSC | 58954 | 0.01288 | LSC | 111109 | 0.0015 | SSR |
| 6958 | 0.015 | LSC | 59154 | 0.02063 | LSC | 111309 | 0.002 | SSR |
| 7158 | 0.01425 | LSC | 59364 | 0.02163 | LSC | 111509 | 0.0045 | SSR |
| 7358 | 0.01438 | LSC | 59682 | 0.02063 | LSC | 111841 | 0.00975 | SSR |
| 7563 | 0.01875 | LSC | 59888 | 0.01625 | LSC | 112041 | 0.01275 | SSR |
| 7789 | 0.02475 | LSC | 60093 | 0.008 | LSC | 112241 | 0.01575 | SSR |
| 7990 | 0.02425 | LSC | 60304 | 0.00538 | LSC | 112441 | 0.01475 | SSR |
| 8229 | 0.02375 | LSC | 60533 | 0.00688 | LSC | 112641 | 0.012 | SSR |
| 8442 | 0.02113 | LSC | 60733 | 0.00837 | LSC | 112841 | 0.0105 | SSR |
| 8654 | 0.01613 | LSC | 60933 | 0.01075 | LSC | 113041 | 0.00875 | SSR |
| 8854 | 0.01463 | LSC | 61140 | 0.01088 | LSC | 113241 | 0.00775 | SSR |
| 9054 | 0.01363 | LSC | 61387 | 0.01075 | LSC | 113441 | 0.00725 | SSR |
| 9254 | 0.01838 | LSC | 61587 | 0.00725 | LSC | 113641 | 0.00725 | SSR |
| 9456 | 0.02613 | LSC | 61787 | 0.00488 | LSC | 113841 | 0.0165 | SSR |
| 9688 | 0.02513 | LSC | 61987 | 0.00588 | LSC | 114048 | 0.02538 | SSR |
| 9900 | 0.02438 | LSC | 62187 | 0.00538 | LSC | 114260 | 0.03113 | SSR |
| 10119 | 0.017 | LSC | 62389 | 0.00675 | LSC | 114478 | 0.03013 | SSR |
| 10319 | 0.00775 | LSC | 62589 | 0.00575 | LSC | 114695 | 0.02613 | SSR |
| 10519 | 0.00925 | LSC | 62789 | 0.00525 | LSC | 114900 | 0.0255 | SSR |
| 10719 | 0.0065 | LSC | 62989 | 0.00588 | LSC | 115130 | 0.02513 | SSR |
| 10919 | 0.0055 | LSC | 63189 | 0.008 | LSC | 115349 | 0.03538 | SSR |
| 11119 | 0.0065 | LSC | 63389 | 0.01338 | LSC | 115552 | 0.03463 | SSR |
| 11319 | 0.0055 | LSC | 63599 | 0.01475 | LSC | 115760 | 0.02775 | SSR |
| 11519 | 0.0085 | LSC | 63815 | 0.01888 | LSC | 115981 | 0.02338 | SSR |
| 11720 | 0.0105 | LSC | 64038 | 0.01688 | LSC | 116187 | 0.01463 | SSR |
| 11920 | 0.011 | LSC | 64238 | 0.011 | LSC | 116387 | 0.01363 | SSR |
| 12120 | 0.01338 | LSC | 64438 | 0.00862 | LSC | 116587 | 0.01575 | SSR |
| 12321 | 0.01138 | LSC | 64638 | 0.0035 | LSC | 116787 | 0.01863 | SSR |
| 12541 | 0.00937 | LSC | 64838 | 0.00475 | LSC | 116987 | 0.01863 | SSR |
| 12741 | 0.00738 | LSC | 65038 | 0.00625 | LSC | 117216 | 0.01588 | SSR |
| 12941 | 0.005 | LSC | 65238 | 0.011 | LSC | 117430 | 0.01275 | SSR |
| 13151 | 0.00725 | LSC | 65446 | 0.012 | LSC | 117630 | 0.00838 | SSR |
| 13353 | 0.00825 | LSC | 65655 | 0.0125 | LSC | 117830 | 0.00688 | SSR |
| 13559 | 0.01225 | LSC | 66395 | 0.016 | LSC | 118030 | 0.00787 | SSR |
| 13764 | 0.0145 | LSC | 66595 | 0.01375 | LSC | 118230 | 0.008 | SSR |
| 13979 | 0.01175 | LSC | 66801 | 0.01588 | LSC | 118430 | 0.008 | SSR |
| 14186 | 0.01125 | LSC | 67001 | 0.01563 | LSC | 118630 | 0.008 | SSR |
| 14386 | 0.00825 | LSC | 67201 | 0.01413 | LSC | 118830 | 0.0065 | SSR |
| 14586 | 0.0045 | LSC | 67403 | 0.01213 | LSC | 119033 | 0.0065 | SSR |
| 14786 | 0.0075 | LSC | 67613 | 0.01625 | LSC | 119233 | 0.00888 | SSR |
| 14986 | 0.008 | LSC | 67826 | 0.01475 | LSC | 119433 | 0.00788 | SSR |
| 15191 | 0.0065 | LSC | 68039 | 0.01275 | LSC | 119633 | 0.01038 | SSR |
| 15391 | 0.007 | LSC | 68240 | 0.01838 | LSC | 119833 | 0.01238 | SSR |
| 15591 | 0.005 | LSC | 68440 | 0.01063 | LSC | 120033 | 0.00925 | SSR |
| 15791 | 0.007 | LSC | 68645 | 0.00912 | LSC | 120233 | 0.01025 | SSR |
| 15991 | 0.0065 | LSC | 68851 | 0.01463 | LSC | 120433 | 0.01125 | SSR |
| 16196 | 0.0065 | LSC | 69051 | 0.011 | LSC | 120633 | 0.01275 | SSR |
| 16396 | 0.0075 | LSC | 69265 | 0.012 | LSC | 120839 | 0.014 | SSR |
| 16596 | 0.0055 | LSC | 69465 | 0.0135 | LSC | 121057 | 0.0145 | SSR |
| 16796 | 0.0075 | LSC | 69665 | 0.01088 | LSC | 121257 | 0.009 | SSR |
| 16996 | 0.01 | LSC | 69866 | 0.00987 | LSC | 121457 | 0.0055 | SSR |
| 17196 | 0.009 | LSC | 70067 | 0.00838 | LSC | 121657 | 0.005 | SSR |
| 17396 | 0.0095 | LSC | 70267 | 0.00887 | LSC | 121857 | 0.0075 | SSR |
| 17596 | 0.0075 | LSC | 70477 | 0.005 | LSC | 122057 | 0.01213 | SSR |
| 17796 | 0.0055 | LSC | 70679 | 0.005 | LSC | 122257 | 0.01563 | SSR |
| 17996 | 0.0045 | LSC | 70879 | 0.00975 | LSC | 122457 | 0.01613 | SSR |
| 18196 | 0.0055 | LSC | 71086 | 0.00925 | LSC | 122668 | 0.01363 | SSR |
| 18396 | 0.009 | LSC | 71297 | 0.01025 | LSC | 122869 | 0.01275 | SSR |
| 18596 | 0.0085 | LSC | 71499 | 0.00925 | LSC | 123075 | 0.00925 | SSR |
| 18796 | 0.00925 | LSC | 71701 | 0.01113 | LSC | 123285 | 0.00925 | SSR |
| 18996 | 0.00775 | LSC | 71901 | 0.01263 | LSC | 123485 | 0.00875 | SSR |
| 19196 | 0.00525 | LSC | 72131 | 0.01413 | LSC | 123685 | 0.006 | SSR |
| 19396 | 0.00713 | LSC | 72333 | 0.01463 | LSC | 123885 | 0.0055 | SSR |
| 19596 | 0.00638 | LSC | 72542 | 0.0095 | LSC | 124085 | 0.0045 | SSR |
| 19796 | 0.00763 | LSC | 72742 | 0.008 | LSC | 124285 | 0.00425 | SSR |
| 19996 | 0.00763 | LSC | 72943 | 0.007 | LSC | 124485 | 0.00475 | SSR |
| 20196 | 0.00575 | LSC | 73165 | 0.007 | LSC | 124685 | 0.00625 | SSR |
| 20396 | 0.00625 | LSC | 73366 | 0.00725 | LSC | 124885 | 0.00675 | SSR |
| 20596 | 0.005 | LSC | 73566 | 0.00775 | LSC | 125086 | 0.0105 | SSR |
| 20796 | 0.0035 | LSC | 73766 | 0.00775 | LSC | 125286 | 0.0115 | SSR |
| 20996 | 0.004 | LSC | 73966 | 0.00825 | LSC | 125545 | 0.013 | SSR |
| 21196 | 0.003 | LSC | 74166 | 0.01 | LSC | 125745 | 0.0195 | SSR |
| 21396 | 0.0025 | LSC | 74366 | 0.008 | LSC | 125945 | 0.02288 | SSR |
| 21596 | 0.004 | LSC | 74566 | 0.00975 | LSC | 126145 | 0.037 | SSR |
| 21796 | 0.0045 | LSC | 74766 | 0.00875 | LSC | 126345 | 0.038 | SSR |
| 21996 | 0.007 | LSC | 74967 | 0.00575 | LSC | 126545 | 0.03438 | SSR |
| 22202 | 0.0105 | LSC | 75167 | 0.00675 | LSC | 126745 | 0.03138 | SSR |
| 22403 | 0.01075 | LSC | 75367 | 0.00525 | LSC | 126945 | 0.0185 | SSR |
| 22611 | 0.00975 | LSC | 75568 | 0.0065 | LSC | 127145 | 0.01725 | SSR |
| 22814 | 0.00725 | LSC | 75773 | 0.0085 | LSC | 127345 | 0.01975 | SSR |
| 23014 | 0.00375 | LSC | 75974 | 0.0085 | LSC | 127545 | 0.02063 | SSR |
| 23214 | 0.003 | LSC | 76199 | 0.01125 | LSC | 127751 | 0.0245 | SSR |
| 23414 | 0.003 | LSC | 76405 | 0.009 | LSC | 127951 | 0.03275 | SSR |
| 23614 | 0.005 | LSC | 76605 | 0.007 | LSC | 128151 | 0.03088 | SSR |
| 23814 | 0.0055 | LSC | 76805 | 0.006 | LSC | 128351 | 0.03188 | SSR |
| 24014 | 0.006 | LSC | 77005 | 0.0025 | LSC | 128551 | 0.03175 | IR |
| 24214 | 0.008 | LSC | 77205 | 0.0035 | LSC | 128751 | 0.03213 | IR |
| 24414 | 0.008 | LSC | 77406 | 0.009 | LSC | 128957 | 0.04062 | IR |
| 24614 | 0.0075 | LSC | 77606 | 0.0115 | LSC | 129157 | 0.042 | IR |
| 24814 | 0.007 | LSC | 77820 | 0.014 | LSC | 129375 | 0.03987 | IR |
| 25014 | 0.005 | LSC | 78020 | 0.0145 | LSC | 129575 | 0.029 | IR |
| 25214 | 0.004 | LSC | 78220 | 0.0095 | LSC | 129787 | 0.0165 | IR |
| 25414 | 0.0035 | LSC | 78420 | 0.01 | LSC | 130119 | 0.00787 | IR |
| 25614 | 0.0025 | LSC | 78620 | 0.01025 | LSC | 130319 | 0.003 | IR |
| 25814 | 0.0025 | LSC | 78820 | 0.00975 | LSC | 130519 | 0.0015 | IR |
| 26014 | 0.0025 | LSC | 79027 | 0.00925 | LSC | 130719 | 0.0005 | IR |
| 26214 | 0.003 | LSC | 79227 | 0.00875 | LSC | 130919 | 0.0015 | IR |
| 26414 | 0.00525 | LSC | 79427 | 0.0055 | LSC | 131125 | 0.001 | IR |
| 26623 | 0.0075 | LSC | 79627 | 0.0055 | LSC | 131325 | 0.001 | IR |
| 26840 | 0.01 | LSC | 79827 | 0.0095 | LSC | 131525 | 0.00425 | IR |
| 27047 | 0.0135 | LSC | 80032 | 0.0085 | LSC | 131737 | 0.00325 | IR |
| 27255 | 0.01275 | LSC | 80232 | 0.01 | LSC | 131953 | 0.00375 | IR |
| 27458 | 0.0125 | LSC | 80435 | 0.01625 | LSC | 132153 | 0.00375 | IR |
| 27672 | 0.013 | LSC | 80635 | 0.01613 | LSC | 132376 | 0.0005 | IR |
| 27892 | 0.00975 | LSC | 80843 | 0.01663 | LSC | 132581 | 0.0005 | IR |
| 28096 | 0.012 | LSC | 81060 | 0.01513 | LSC | 132787 | 0.0005 | IR |
| 28302 | 0.0125 | LSC | 81260 | 0.01238 | LSC | 132987 | 0.0005 | IR |
| 28532 | 0.01138 | LSC | 81460 | 0.0095 | LSC | 133187 | 0.001 | IR |
| 28733 | 0.01163 | LSC | 81691 | 0.0075 | LSC | 133387 | 0.001 | IR |
| 28973 | 0.01288 | LSC | 81891 | 0.0085 | LSC | 133587 | 0.0005 | IR |
| 29177 | 0.01338 | LSC | 82091 | 0.005 | LSC | 133787 | 0.0005 | IR |
| 29377 | 0.01575 | LSC | 82292 | 0.00825 | LSC | 133987 | 0 | IR |
| 29583 | 0.02013 | LSC | 82492 | 0.01375 | LSC | 134187 | 0 | IR |
| 29783 | 0.01813 | LSC | 82692 | 0.01725 | LSC | 134387 | 0.0005 | IR |
| 30004 | 0.02325 | LSC | 82914 | 0.02225 | LSC | 134587 | 0.0005 | IR |
| 30204 | 0.0245 | LSC | 83119 | 0.02 | LSC | 134787 | 0.0005 | IR |
| 30414 | 0.01913 | LSC | 83320 | 0.0155 | LSC | 134987 | 0.001 | IR |
| 30620 | 0.02213 | LSC | 83530 | 0.01738 | LSC | 135187 | 0.001 | IR |
| 30820 | 0.0195 | LSC | 83752 | 0.01288 | LSC | 135387 | 0.001 | IR |
| 31034 | 0.01875 | LSC | 83965 | 0.01338 | IR | 135587 | 0.002 | IR |
| 31313 | 0.02275 | LSC | 84165 | 0.01375 | IR | 135787 | 0.002 | IR |
| 31522 | 0.02325 | LSC | 84365 | 0.01013 | IR | 135987 | 0.0015 | IR |
| 31728 | 0.021 | LSC | 84565 | 0.00862 | IR | 136193 | 0.0015 | IR |
| 31935 | 0.01675 | LSC | 84765 | 0.00813 | IR | 136393 | 0.0005 | IR |
| 32145 | 0.01725 | LSC | 84965 | 0.00725 | IR | 136593 | 0 | IR |
| 32358 | 0.015 | LSC | 85165 | 0.0035 | IR | 136793 | 0.0005 | IR |
| 32578 | 0.01125 | LSC | 85365 | 0.004 | IR | 136993 | 0.0005 | IR |
| 32778 | 0.011 | LSC | 85565 | 0.0025 | IR | 137193 | 0.0015 | IR |
| 32978 | 0.00838 | LSC | 85765 | 0.0015 | IR | 137393 | 0.002 | IR |
| 33178 | 0.00463 | LSC | 85965 | 0.0015 | IR | 137593 | 0.0015 | IR |
| 33378 | 0.00413 | LSC | 86165 | 0.0015 | IR | 137793 | 0.002 | IR |
| 33578 | 0.00338 | LSC | 86365 | 0.0005 | IR | 137993 | 0.001 | IR |
| 33778 | 0.0015 | LSC | 86565 | 0.0015 | IR | 138193 | 0.0005 | IR |
| 33978 | 0.0025 | LSC | 86765 | 0.002 | IR | 138393 | 0.0005 | IR |
| 34178 | 0.0035 | LSC | 86965 | 0.0015 | IR | 138593 | 0 | IR |
| 34378 | 0.004 | LSC | 87165 | 0.0015 | IR | 138793 | 0 | IR |
| 34578 | 0.005 | LSC | 87365 | 0.0005 | IR | 138993 | 0 | IR |
| 34778 | 0.0035 | LSC | 87565 | 0.0005 | IR | 139193 | 0 | IR |
| 34978 | 0.0045 | LSC | 87765 | 0.001 | IR | 139393 | 0 | IR |
| 35178 | 0.0085 | LSC | 87965 | 0.0015 | IR | 139593 | 0.0005 | IR |
| 35387 | 0.00987 | LSC | 88165 | 0.0015 | IR | 139793 | 0.003 | IR |
| 35588 | 0.01038 | LSC | 88365 | 0.0015 | IR | 139993 | 0.003 | IR |
| 35788 | 0.01063 | LSC | 88565 | 0.001 | IR | 140193 | 0.0045 | IR |
| 36000 | 0.00937 | LSC | 88771 | 0.0005 | IR | 140393 | 0.0045 | IR |
| 36200 | 0.01175 | LSC | 88971 | 0.001 | IR | 140602 | 0.003 | IR |
| 36411 | 0.01575 | LSC | 89171 | 0.0015 | IR | 140802 | 0.003 | IR |
| 36641 | 0.015 | LSC | 89371 | 0.0015 | IR | 141008 | 0.0035 | IR |
| 36862 | 0.01275 | LSC | 89571 | 0.002 | IR | 141208 | 0.004 | IR |
| 37065 | 0.00925 | LSC | 89777 | 0.0025 | IR | 141409 | 0.003 | IR |
| 37268 | 0.00825 | LSC | 89983 | 0.0015 | IR | 141609 | 0.003 | IR |
| 37468 | 0.00675 | LSC | 90207 | 0.002 | IR | 141809 | 0.001 | IR |
| 37671 | 0.00575 | LSC | 90407 | 0.002 | IR | 142009 | 0.0005 | IR |
| 37871 | 0.0045 | LSC | 90607 | 0.001 | IR | 142209 | 0.0005 | IR |
| 38071 | 0.0035 | LSC | 90813 | 0.001 | IR | 142409 | 0.0005 | IR |
| 38271 | 0.004 | LSC | 91013 | 0.001 | IR | 142609 | 0.0005 | IR |
| 38471 | 0.00625 | LSC | 91213 | 0.003 | IR | 142809 | 0 | IR |
| 38671 | 0.00675 | LSC | 91413 | 0.003 | IR | 143009 | 0 | IR |
| 38871 | 0.00613 | LSC | 91613 | 0.00475 | IR | 143209 | 0 | IR |
| 39071 | 0.00713 | LSC | 91813 | 0.00475 | IR | 143409 | 0 | IR |
| 39271 | 0.00638 | LSC | 92013 | 0.00225 | IR | 143609 | 0.0005 | IR |
| 39471 | 0.00588 | LSC | 92213 | 0.00225 | IR | 143809 | 0.001 | IR |
| 39671 | 0.0045 | LSC | 92413 | 0.0005 | IR | 144009 | 0.001 | IR |
| 39871 | 0.003 | LSC | 92613 | 0 | IR | 144209 | 0.001 | IR |
| 40071 | 0.0015 | LSC | 92813 | 0.0005 | IR | 144409 | 0.0015 | IR |
| 40271 | 0.003 | LSC | 93013 | 0.0015 | IR | 144609 | 0.0015 | IR |
| 40471 | 0.003 | LSC | 93213 | 0.0025 | IR | 144809 | 0.002 | IR |
| 40671 | 0.0035 | LSC | 93413 | 0.003 | IR | 145009 | 0.002 | IR |
| 40871 | 0.0035 | LSC | 93613 | 0.0025 | IR | 145209 | 0.001 | IR |
| 41071 | 0.002 | LSC | 93813 | 0.002 | IR | 145409 | 0.0005 | IR |
| 41271 | 0.00325 | LSC | 94013 | 0.001 | IR | 145609 | 0 | IR |
| 41471 | 0.00275 | LSC | 94213 | 0.003 | IR | 145809 | 0 | IR |
| 41671 | 0.00225 | LSC | 94413 | 0.0035 | IR | 146009 | 0.0005 | IR |
| 41871 | 0.00375 | LSC | 94613 | 0.003 | IR | 146215 | 0.0005 | IR |
| 42071 | 0.00525 | LSC | 94813 | 0.003 | IR | 146415 | 0.0005 | IR |
| 42281 | 0.00875 | LSC | 95013 | 0.001 | IR | 146615 | 0.001 | IR |
| 42484 | 0.00975 | LSC | 95213 | 0.0005 | IR | 146815 | 0.003 | IR |
| 42722 | 0.01075 | LSC | 95413 | 0.0005 | IR | 147015 | 0.003 | IR |
| 42927 | 0.01 | LSC | 95619 | 0.0005 | IR | 147215 | 0.0035 | IR |
| 43142 | 0.0075 | LSC | 95819 | 0 | IR | 147415 | 0.003 | IR |
| 43344 | 0.0085 | LSC | 96019 | 0 | IR | 147615 | 0.001 | IR |
| 43545 | 0.0065 | LSC | 96219 | 0.0005 | IR | 147815 | 0.002 | IR |
| 43745 | 0.0045 | LSC | 96419 | 0.001 | IR | 148015 | 0.0025 | IR |
| 43945 | 0.0055 | LSC | 96619 | 0.002 | IR | 148215 | 0.003 | IR |
| 44145 | 0.004 | LSC | 96819 | 0.002 | IR | 148415 | 0.0025 | IR |
| 44345 | 0.004 | LSC | 97019 | 0.0015 | IR | 148615 | 0.0015 | IR |
| 44551 | 0.007 | LSC | 97219 | 0.0015 | IR | 148815 | 0.0005 | IR |
| 44755 | 0.00725 | LSC | 97419 | 0.001 | IR | 149015 | 0 | IR |
| 44956 | 0.01025 | LSC | 97619 | 0.001 | IR | 149215 | 0.0005 | IR |
| 45157 | 0.01075 | LSC | 97819 | 0.001 | IR | 149415 | 0.00225 | IR |
| 45357 | 0.00925 | LSC | 98019 | 0.0005 | IR | 149615 | 0.00225 | IR |
| 45558 | 0.008 | LSC | 98219 | 0 | IR | 149815 | 0.00325 | IR |
| 45758 | 0.005 | LSC | 98419 | 0 | IR | 150015 | 0.00475 | IR |
| 45958 | 0.0055 | LSC | 98619 | 0 | IR | 150215 | 0.003 | IR |
| 46163 | 0.0075 | LSC | 98819 | 0 | IR | 150415 | 0.003 | IR |
| 46372 | 0.01275 | LSC | 99019 | 0 | IR | 150615 | 0.002 | IR |
| 46579 | 0.01963 | LSC | 99219 | 0.0005 | IR | 150815 | 0.001 | IR |
| 46808 | 0.02338 | LSC | 99419 | 0.0005 | IR | 151021 | 0.001 | IR |
| 47034 | 0.02188 | LSC | 99619 | 0.0005 | IR | 151221 | 0.002 | IR |
| 47239 | 0.01763 | LSC | 99819 | 0.0015 | IR | 151421 | 0.0025 | IR |
| 47439 | 0.01525 | LSC | 100019 | 0.0025 | IR | 151645 | 0.0015 | IR |
| 47645 | 0.015 | LSC | 100219 | 0.003 | IR | 151851 | 0.0025 | IR |
| 47847 | 0.0165 | LSC | 100419 | 0.004 | IR | 152057 | 0.002 | IR |
| 48051 | 0.016 | LSC | 100620 | 0.0035 | IR | 152257 | 0.0015 | IR |
| 48251 | 0.02025 | LSC | 100820 | 0.0025 | IR | 152457 | 0.0015 | IR |
| 48716 | 0.0325 | LSC | 101026 | 0.0025 | IR | 152657 | 0.001 | IR |
| 48952 | 0.0305 | LSC | 101229 | 0.0035 | IR | 152857 | 0.0005 | IR |
| 49158 | 0.0305 | LSC | 101435 | 0.004 | IR | 153063 | 0.001 | IR |
| 49378 | 0.02275 | LSC | 101635 | 0.0035 | IR | 153263 | 0.0015 | IR |
| 49578 | 0.007 | LSC | 101835 | 0.003 | IR | 153463 | 0.001 | IR |
| 49778 | 0.006 | LSC | 102035 | 0.001 | IR | 153663 | 0.0015 | IR |
| 49978 | 0.005 | LSC | 102235 | 0 | IR | 153863 | 0.001 | IR |
| 50178 | 0.005 | LSC | 102435 | 0 | IR | 154063 | 0.0005 | IR |
| 50378 | 0.005 | LSC | 102635 | 0 | IR | 154263 | 0.0005 | IR |
| 50583 | 0.00575 | LSC | 102835 | 0 | IR | 154463 | 0.001 | IR |
| 50783 | 0.00925 | LSC | 103035 | 0 | IR | 154663 | 0.0015 | IR |
| 50983 | 0.015 | LSC | 103235 | 0.0005 | IR | 154863 | 0.002 | IR |
| 51198 | 0.015 | LSC | 103435 | 0.0005 | IR | 155063 | 0.002 | IR |
| 51426 | 0.01975 | LSC | 103635 | 0.001 | IR | 155263 | 0.001 | IR |
| 51639 | 0.01625 | LSC | 103835 | 0.0015 | IR | 155463 | 0.0015 | IR |
| 51847 | 0.0115 | LSC | 104035 | 0.0015 | IR | 155663 | 0.0015 | IR |
| 52050 | 0.0125 | LSC | 104235 | 0.002 | IR | 155863 | 0.0015 | IR |
| 52250 | 0.008 | LSC | 104435 | 0.0015 | IR | 156053 | 0.00205 | IR |
| 52456 | 0.009 | LSC | 104635 | 0.001 | IR |  |  |  |
| 52656 | 0.00925 | LSC | 104835 | 0.0005 | IR |  |  |  |

We considered a slide window of 800 bp and a step size of 200 bp.

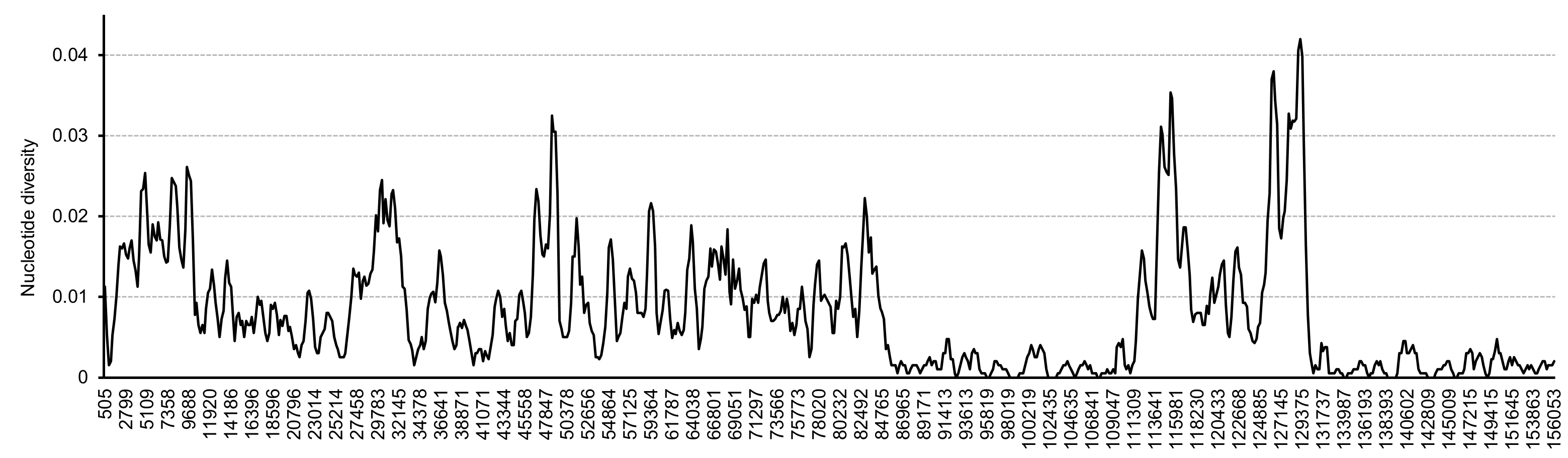
**Table S9.** Codon usage of the five species.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| title | gene name | GC | GC1 | GC2 | GC3 | ENC | T3s | C3s | A3s | G3s | CAI | GC3s |
| MT4309831\_accD | *accD* | 0.3408 | 0.4 | 0.3627 | 0.3 | 45.0930 | 0.5959 | 0.1458 | 0.3565 | 0.1993 | 0.1970 | 0.2480 |
| MT4309831\_atpA | *atpA* | 0.4016 | 0.5 | 0.3976 | 0.3 | 45.3800 | 0.4675 | 0.1675 | 0.4302 | 0.1484 | 0.1980 | 0.2500 |
| MT4309831\_atpB | *atpB* | 0.4268 | 0.6 | 0.3976 | 0.3 | 49.3760 | 0.4289 | 0.1887 | 0.4194 | 0.1774 | 0.2050 | 0.2940 |
| MT4309831\_atpE | *atpE* | 0.3935 | 0.5 | 0.3910 | 0.3 | 50.9600 | 0.4623 | 0.1509 | 0.434 | 0.1739 | 0.1680 | 0.2520 |
| MT4309831\_atpF | *atpF* | 0.3935 | 0.5 | 0.3910 | 0.3 | 43.7540 | 0.4384 | 0.1781 | 0.4779 | 0.2033 | 0.1570 | 0.2830 |
| MT4309831\_atpH | *atpH* | 0.4431 | 0.6 | 0.4878 | 0.2 | 43.8020 | 0.5634 | 0.0423 | 0.3151 | 0.1940 | 0.1910 | 0.2030 |
| MT4309831\_atpI | *atpI* | 0.3787 | 0.5 | 0.3600 | 0.3 | 48.0530 | 0.4502 | 0.1991 | 0.4337 | 0.1111 | 0.1700 | 0.2530 |
| MT4309831\_ccsA | *ccsA* | 0.3009 | 0.3 | 0.3465 | 0.2 | 42.1180 | 0.5107 | 0.1286 | 0.4693 | 0.1230 | 0.1460 | 0.1910 |
| MT4309831\_cemA | *cemA* | 0.3145 | 0.4 | 0.2826 | 0.3 | 46.3310 | 0.5304 | 0.1878 | 0.4351 | 0.1667 | 0.2010 | 0.2520 |
| MT4309831\_clpP | *clpP* | 0.4078 | 0.5 | 0.3807 | 0.3 | 51.2850 | 0.4268 | 0.1911 | 0.4533 | 0.1527 | 0.1570 | 0.2700 |
| MT4309831\_matK | *matK* | 0.3106 | 0.4 | 0.2922 | 0.3 | 51.3610 | 0.4931 | 0.1429 | 0.4831 | 0.2095 | 0.1460 | 0.2490 |
| MT4309831\_ndhA | *ndhA* | 0.3343 | 0.4 | 0.3850 | 0.2 | 42.2090 | 0.4776 | 0.1154 | 0.4826 | 0.0992 | 0.1290 | 0.1720 |
| MT4309831\_ndhB | *ndhB* | 0.3717 | 0.4 | 0.3899 | 0.3 | 46.0460 | 0.4369 | 0.2056 | 0.4313 | 0.1205 | 0.1590 | 0.2670 |
| MT4309831\_ndhB-2 | *ndhB* | 0.3717 | 0.4 | 0.3899 | 0.3 | 46.0460 | 0.4369 | 0.2056 | 0.4313 | 0.1205 | 0.1590 | 0.2670 |
| MT4309831\_ndhC | *ndhC* | 0.3609 | 0.5 | 0.3471 | 0.3 | 50.1540 | 0.5248 | 0.0891 | 0.4045 | 0.1842 | 0.2010 | 0.2050 |
| MT4309831\_ndhD | *ndhD* | 0.3399 | 0.4 | 0.3649 | 0.3 | 47.5030 | 0.4795 | 0.1621 | 0.4321 | 0.1173 | 0.1430 | 0.2250 |
| MT4309831\_ndhE | *ndhE* | 0.3301 | 0.4 | 0.3235 | 0.3 | 58.8050 | 0.5281 | 0.1573 | 0.3836 | 0.1311 | 0.1500 | 0.2270 |
| MT4309831\_ndhF | *ndhF* | 0.3039 | 0.4 | 0.3494 | 0.2 | 42.4930 | 0.5381 | 0.1026 | 0.4759 | 0.1176 | 0.1390 | 0.1660 |
| MT4309831\_ndhG | *ndhG* | 0.3427 | 0.4 | 0.3446 | 0.2 | 47.1770 | 0.4907 | 0.1056 | 0.4167 | 0.1712 | 0.1230 | 0.2120 |
| MT4309831\_ndhH | *ndhH* | 0.3706 | 0.5 | 0.3655 | 0.2 | 46.2990 | 0.5115 | 0.1148 | 0.5017 | 0.1230 | 0.1580 | 0.1800 |
| MT4309831\_ndhI | *ndhI* | 0.3292 | 0.4 | 0.3665 | 0.2 | 38.9940 | 0.5746 | 0.1418 | 0.463 | 0.0879 | 0.1900 | 0.1750 |
| MT4309831\_ndhJ | *ndhJ* | 0.4046 | 0.5 | 0.3899 | 0.3 | 54.0620 | 0.4724 | 0.2047 | 0.4018 | 0.1800 | 0.1680 | 0.2950 |
| MT4309831\_ndhK | *ndhK* | 0.3776 | 0.4 | 0.4513 | 0.2 | 47.7390 | 0.5079 | 0.1152 | 0.4379 | 0.1548 | 0.1620 | 0.2120 |
| MT4309831\_petA | *petA* | 0.3842 | 0.5 | 0.3551 | 0.3 | 52.8500 | 0.502 | 0.1451 | 0.4071 | 0.2027 | 0.1560 | 0.2620 |
| MT4309831\_petB | *petB* | 0.3873 | 0.5 | 0.4120 | 0.3 | 41.6640 | 0.55 | 0.1278 | 0.3789 | 0.1088 | 0.2290 | 0.1960 |
| MT4309831\_petD | *petD* | 0.3830 | 0.5 | 0.3913 | 0.2 | 39.9060 | 0.4565 | 0.1232 | 0.4677 | 0.1304 | 0.1760 | 0.2090 |
| MT4309831\_petG | *petG* | 0.3421 | 0.4 | 0.3158 | 0.3 | 37.9230 | 0.5152 | 0.1818 | 0.3571 | 0.1250 | 0.1990 | 0.2500 |
| MT4309831\_petL | *petL* | 0.3021 | 0.3 | 0.4375 | 0.1 | 49.4170 | 0.5172 | 0.1034 | 0.4615 | 0.0000 | 0.1130 | 0.1000 |
| MT4309831\_petN | *petN* | 0.4333 | 0.5 | 0.4333 | 0.4 | 29.3050 | 0.36 | 0.2000 | 0.4545 | 0.0476 | 0.1210 | 0.2400 |
| MT4309831\_psaA | *psaA* | 0.4177 | 0.5 | 0.4301 | 0.3 | 47.5740 | 0.4727 | 0.1732 | 0.4137 | 0.1446 | 0.1930 | 0.2560 |
| MT4309831\_psaB | *psaB* | 0.4036 | 0.5 | 0.4286 | 0.3 | 47.8370 | 0.4904 | 0.1635 | 0.4051 | 0.1577 | 0.1770 | 0.2540 |
| MT4309831\_psaC | *psaC* | 0.4146 | 0.5 | 0.5366 | 0.3 | 47.5950 | 0.4697 | 0.1515 | 0.5179 | 0.1154 | 0.1900 | 0.2110 |
| MT4309831\_psaI | *psaI* | 0.3158 | 0.4 | 0.2895 | 0.3 | 41.9010 | 0.5313 | 0.1563 | 0.3846 | 0.1364 | 0.1900 | 0.2290 |
| MT4309831\_psaJ | *psaJ* | 0.3411 | 0.4 | 0.3953 | 0.2 | 29.6800 | 0.3947 | 0.0789 | 0.6129 | 0.1034 | 0.1320 | 0.1500 |
| MT4309831\_psbA | *psbA* | 0.4143 | 0.5 | 0.4350 | 0.3 | 40.0020 | 0.5691 | 0.2237 | 0.2857 | 0.0811 | 0.3310 | 0.2600 |
| MT4309831\_psbB | *psbB* | 0.4303 | 0.6 | 0.4597 | 0.3 | 46.8300 | 0.5196 | 0.1455 | 0.3854 | 0.1449 | 0.1850 | 0.2350 |
| MT4309831\_psbC | *psbC* | 0.4339 | 0.5 | 0.4599 | 0.3 | 44.5600 | 0.4617 | 0.1877 | 0.3909 | 0.1424 | 0.1930 | 0.2750 |
| MT4309831\_psbD | *psbD* | 0.4190 | 0.5 | 0.4322 | 0.3 | 44.3970 | 0.5284 | 0.1839 | 0.3592 | 0.1299 | 0.2490 | 0.2570 |
| MT4309831\_psbE | *psbE* | 0.4246 | 0.4 | 0.4762 | 0.4 | 48.5660 | 0.4521 | 0.2740 | 0.3333 | 0.1111 | 0.1860 | 0.3250 |
| MT4309831\_psbF | *psbF* | 0.4250 | 0.5 | 0.4500 | 0.4 | 61.0000 | 0.3824 | 0.1765 | 0.3667 | 0.2308 | 0.1590 | 0.3330 |
| MT4309831\_psbH | *psbH* | 0.3919 | 0.4 | 0.4595 | 0.3 | 36.9290 | 0.5246 | 0.0492 | 0.3559 | 0.2182 | 0.1780 | 0.2210 |
| MT4309831\_psbI | *psbI* | 0.3333 | 0.5 | 0.2973 | 0.2 | 24.4650 | 0.5313 | 0.1563 | 0.48 | 0.0435 | 0.1880 | 0.1710 |
| MT4309831\_psbJ | *psbJ* | 0.3740 | 0.4 | 0.4878 | 0.2 | 28.6000 | 0.5789 | 0.0526 | 0.3333 | 0.1111 | 0.1740 | 0.1320 |
| MT4309831\_psbK | *psbK* | 0.3817 | 0.4 | 0.3387 | 0.4 | 42.8870 | 0.4909 | 0.2545 | 0.2683 | 0.1622 | 0.1310 | 0.3450 |
| MT4309831\_psbL | *psbL* | 0.2906 | 0.4 | 0.2564 | 0.3 | 39.0150 | 0.5313 | 0.1875 | 0.4583 | 0.0870 | 0.1700 | 0.2220 |
| MT4309831\_psbM | *psbM* | 0.3048 | 0.5 | 0.2571 | 0.2 | 47.1670 | 0.6333 | 0.1333 | 0.3077 | 0.0952 | 0.2150 | 0.1820 |
| MT4309831\_psbN | *psbN* | 0.4470 | 0.6 | 0.4091 | 0.4 | 37.1650 | 0.3611 | 0.2500 | 0.4545 | 0.1613 | 0.1360 | 0.3330 |
| MT4309831\_psbT | *psbT* | 0.2941 | 0.3 | 0.3529 | 0.2 | 47.3850 | 0.4815 | 0.1111 | 0.5 | 0.1364 | 0.1900 | 0.1880 |
| MT4309831\_psbZ | *psbZ* | 0.3492 | 0.4 | 0.4127 | 0.3 | 57.4430 | 0.5439 | 0.1404 | 0.28 | 0.1429 | 0.2290 | 0.2370 |
| MT4309831\_rbcL | *rbcL* | 0.4419 | 0.6 | 0.4384 | 0.3 | 49.2180 | 0.4923 | 0.1913 | 0.3883 | 0.1622 | 0.2600 | 0.2810 |
| MT4309831\_rpl14 | *rpl14* | 0.3930 | 0.5 | 0.3902 | 0.3 | 45.9360 | 0.4078 | 0.1553 | 0.5 | 0.1548 | 0.1640 | 0.2420 |
| MT4309831\_rpl16 | *rpl16* | 0.4142 | 0.5 | 0.5147 | 0.2 | 40.2020 | 0.4286 | 0.1238 | 0.5351 | 0.0792 | 0.1500 | 0.1650 |
| MT4309831\_rpl2 | *rpl2* | 0.4327 | 0.5 | 0.4836 | 0.3 | 54.2790 | 0.3966 | 0.1853 | 0.448 | 0.1709 | 0.1350 | 0.2870 |
| MT4309831\_rpl2-2 | *rpl2* | 0.4327 | 0.5 | 0.4836 | 0.3 | 54.2790 | 0.3966 | 0.1853 | 0.448 | 0.1709 | 0.1350 | 0.2870 |
| MT4309831\_rpl20 | *rpl20* | 0.3672 | 0.4 | 0.4322 | 0.3 | 51.435 | 0.42 | 0.12 | 0.4889 | 0.2025 | 0.091 | 0.246 |
| MT4309831\_rpl22 | *rpl22* | 0.3395 | 0.4 | 0.3789 | 0.2 | 47.986 | 0.4634 | 0.1789 | 0.5508 | 0.0935 | 0.171 | 0.208 |
| MT4309831\_rpl23 | *rpl23* | 0.3688 | 0.4 | 0.383 | 0.3 | 53.869 | 0.4521 | 0.1507 | 0.4571 | 0.1774 | 0.127 | 0.253 |
| MT4309831\_rpl23-2 | *rpl23* | 0.3688 | 0.4 | 0.383 | 0.3 | 53.869 | 0.4521 | 0.1507 | 0.4571 | 0.1774 | 0.127 | 0.253 |
| MT4309831\_rpl32 | *rpl32* | 0.3082 | 0.3 | 0.434 | 0.2 | 39.62 | 0.5429 | 0.0857 | 0.4884 | 0.15 | 0.24 | 0.184 |
| MT4309831\_rpl33 | *rpl33* | 0.3632 | 0.4 | 0.3881 | 0.3 | 39.995 | 0.4902 | 0.2157 | 0.3878 | 0.2381 | 0.194 | 0.323 |
| MT4309831\_rpl36 | *rpl36* | 0.3947 | 0.4 | 0.4737 | 0.3 | 21.459 | 0.3793 | 0.1379 | 0.4516 | 0.28 | 0.103 | 0.306 |
| MT4309831\_rpoA | *rpoA* | 0.3354 | 0.5 | 0.2988 | 0.3 | 48.469 | 0.4669 | 0.1634 | 0.5165 | 0.1546 | 0.15 | 0.232 |
| MT4309831\_rpoB | *rpoB* | 0.3849 | 0.5 | 0.3765 | 0.3 | 48.876 | 0.4636 | 0.1303 | 0.4528 | 0.2117 | 0.149 | 0.256 |
| MT4309831\_rpoC1 | *rpoC1* | 0.3764 | 0.5 | 0.3759 | 0.3 | 47.434 | 0.4852 | 0.1439 | 0.4717 | 0.1678 | 0.155 | 0.234 |
| MT4309831\_rpoC2 | *rpoC2* | 0.3675 | 0.5 | 0.3675 | 0.3 | 49.463 | 0.4556 | 0.1652 | 0.4514 | 0.1909 | 0.15 | 0.267 |
| MT4309831\_rps11 | *rps11* | 0.4317 | 0.5 | 0.5683 | 0.2 | 40.862 | 0.4426 | 0.1148 | 0.5 | 0.0755 | 0.135 | 0.164 |
| MT4309831\_rps12 | *rps12* | 0.4355 | 0.5 | 0.4758 | 0.3 | 48.167 | 0.3689 | 0.1942 | 0.4571 | 0.1649 | 0.131 | 0.295 |
| MT4309831\_rps12-2 | *rps12* | 0.4355 | 0.5 | 0.4758 | 0.3 | 48.167 | 0.3689 | 0.1942 | 0.4571 | 0.1649 | 0.131 | 0.295 |
| MT4309831\_rps14 | *rps14* | 0.4158 | 0.4 | 0.4752 | 0.3 | 45.815 | 0.3733 | 0.12 | 0.4512 | 0.2895 | 0.137 | 0.323 |
| MT4309831\_rps15 | *rps15* | 0.3071 | 0.4 | 0.3034 | 0.2 | 42.408 | 0.4688 | 0.0625 | 0.5493 | 0.2154 | 0.156 | 0.207 |
| MT4309831\_rps16 | *rps16* | 0.3558 | 0.5 | 0.382 | 0.2 | 46.847 | 0.5417 | 0.0833 | 0.4429 | 0.1719 | 0.14 | 0.195 |
| MT4309831\_rps18 | *rps18* | 0.3366 | 0.3 | 0.4314 | 0.2 | 36.373 | 0.5063 | 0.1013 | 0.4302 | 0.1818 | 0.111 | 0.222 |
| MT4309831\_rps19 | *rps19* | 0.3477 | 0.4 | 0.3763 | 0.2 | 51.797 | 0.4267 | 0.1333 | 0.5211 | 0.1695 | 0.126 | 0.225 |
| MT4309831\_rps2 | *rps2* | 0.3755 | 0.4 | 0.4219 | 0.3 | 47.956 | 0.487 | 0.1347 | 0.4294 | 0.1948 | 0.173 | 0.248 |
| MT4309831\_rps3 | *rps3* | 0.3212 | 0.5 | 0.3242 | 0.2 | 39.303 | 0.5096 | 0.1529 | 0.56 | 0.0556 | 0.185 | 0.152 |
| MT4309831\_rps4 | *rps4* | 0.3828 | 0.5 | 0.3663 | 0.3 | 48.522 | 0.475 | 0.1625 | 0.4479 | 0.1533 | 0.151 | 0.247 |
| MT4309831\_rps7 | *rps7* | 0.4081 | 0.5 | 0.4551 | 0.2 | 45.752 | 0.405 | 0.157 | 0.5231 | 0.1176 | 0.187 | 0.22 |
| MT4309831\_rps7-2 | *rps7* | 0.4081 | 0.5 | 0.4551 | 0.2 | 45.752 | 0.405 | 0.157 | 0.5231 | 0.1176 | 0.187 | 0.22 |
| MT4309831\_rps8 | *rps8* | 0.3531 | 0.4 | 0.3926 | 0.3 | 40.168 | 0.3636 | 0.1909 | 0.5093 | 0.1628 | 0.112 | 0.269 |
| MT4309831\_ycf1 | *ycf1* | 0.3477 | 0.4 | 0.2997 | 0.3 | 45.862 | 0.4348 | 0.221 | 0.4557 | 0.1896 | 0.17 | 0.307 |
| MT4309831\_ycf1-2 | *ycf1* | 0.2884 | 0.3 | 0.2822 | 0.2 | 56.324 | 0.4985 | 0.1662 | 0.5662 | 0.1222 | 0.18 | 0.204 |
| MT4309831\_ycf2 | *ycf2* | 0.3732 | 0.4 | 0.3437 | 0.4 | 52.858 | 0.4464 | 0.2062 | 0.3976 | 0.2642 | 0.155 | 0.341 |
| MT4309831\_ycf2-2 | *ycf2* | 0.3732 | 0.4 | 0.3437 | 0.4 | 52.858 | 0.4464 | 0.2062 | 0.3976 | 0.2642 | 0.155 | 0.341 |
| MT4309831\_ycf3 | *ycf3* | 0.3886 | 0.5 | 0.3905 | 0.3 | 56.1 | 0.4924 | 0.1667 | 0.4492 | 0.1923 | 0.17 | 0.263 |
| MT4309831\_ycf4 | *ycf4* | 0.3766 | 0.4 | 0.4162 | 0.3 | 45.674 | 0.5232 | 0.1457 | 0.3741 | 0.1795 | 0.171 | 0.247 |
| MT880913\_accD | *accD* | 0.3388 | 0.4 | 0.3608 | 0.3 | 45.173 | 0.5964 | 0.1542 | 0.3547 | 0.1918 | 0.201 | 0.25 |
| MT880913\_atpA | *atpA* | 0.4009 | 0.5 | 0.3976 | 0.3 | 45.763 | 0.47 | 0.16 | 0.4302 | 0.1536 | 0.195 | 0.248 |
| MT880913\_atpB | *atpB* | 0.4281 | 0.6 | 0.4016 | 0.3 | 48.403 | 0.4363 | 0.1838 | 0.4134 | 0.1791 | 0.21 | 0.292 |
| MT880913\_atpE | *atpE* | 0.3935 | 0.5 | 0.391 | 0.3 | 50.96 | 0.4623 | 0.1509 | 0.434 | 0.1739 | 0.168 | 0.252 |
| MT880913\_atpF | *atpF* | 0.3514 | 0.4 | 0.3189 | 0.3 | 46.642 | 0.449 | 0.1565 | 0.4745 | 0.2114 | 0.155 | 0.272 |
| MT880913\_atpH | *atpH* | 0.4431 | 0.6 | 0.4878 | 0.2 | 43.802 | 0.5634 | 0.0423 | 0.3151 | 0.194 | 0.191 | 0.203 |
| MT880913\_atpI | *atpI* | 0.3787 | 0.5 | 0.36 | 0.3 | 47.944 | 0.4597 | 0.1848 | 0.4235 | 0.1287 | 0.173 | 0.253 |
| MT880913\_ccsA | *ccsA* | 0.2898 | 0.3 | 0.3435 | 0.2 | 40.924 | 0.5161 | 0.1039 | 0.5022 | 0.1053 | 0.145 | 0.159 |
| MT880913\_cemA | *cemA* | 0.3072 | 0.4 | 0.2739 | 0.3 | 46.125 | 0.5389 | 0.1778 | 0.4444 | 0.168 | 0.197 | 0.243 |
| MT880913\_clpP | *clpP* | 0.4027 | 0.5 | 0.3807 | 0.3 | 51.113 | 0.4268 | 0.1975 | 0.4733 | 0.1221 | 0.162 | 0.254 |
| MT880913\_matK | *matK* | 0.3142 | 0.4 | 0.2931 | 0.3 | 52.427 | 0.4833 | 0.1459 | 0.4797 | 0.2124 | 0.146 | 0.256 |
| MT880913\_ndhA | *ndhA* | 0.3352 | 0.4 | 0.3795 | 0.2 | 43.04 | 0.4727 | 0.1158 | 0.4826 | 0.1074 | 0.13 | 0.178 |
| MT880913\_ndhB | *ndhB* | 0.3697 | 0.4 | 0.3821 | 0.3 | 46.111 | 0.4412 | 0.2081 | 0.4251 | 0.1242 | 0.161 | 0.27 |
| MT880913\_ndhB-2 | *ndhB* | 0.3697 | 0.4 | 0.3821 | 0.3 | 46.111 | 0.4412 | 0.2081 | 0.4251 | 0.1242 | 0.161 | 0.27 |
| MT880913\_ndhC | *ndhC* | 0.3636 | 0.5 | 0.3471 | 0.3 | 51.467 | 0.5347 | 0.1089 | 0.3977 | 0.16 | 0.197 | 0.205 |
| MT880913\_ndhD | *ndhD* | 0.3315 | 0.4 | 0.3585 | 0.3 | 48.005 | 0.4841 | 0.148 | 0.4307 | 0.1329 | 0.137 | 0.222 |
| MT880913\_ndhE | *ndhE* | 0.3333 | 0.4 | 0.3235 | 0.3 | 54.298 | 0.5056 | 0.1573 | 0.3973 | 0.1475 | 0.142 | 0.237 |
| MT880913\_ndhF | *ndhF* | 0.2999 | 0.4 | 0.3481 | 0.2 | 41.563 | 0.546 | 0.1045 | 0.474 | 0.1088 | 0.144 | 0.162 |
| MT880913\_ndhG | *ndhG* | 0.3427 | 0.4 | 0.3446 | 0.2 | 47.036 | 0.4907 | 0.1118 | 0.4167 | 0.1622 | 0.122 | 0.212 |
| MT880913\_ndhH | *ndhH* | 0.3723 | 0.5 | 0.3655 | 0.2 | 47.392 | 0.5132 | 0.1118 | 0.4931 | 0.1344 | 0.157 | 0.185 |
| MT880913\_ndhI | *ndhI* | 0.3313 | 0.4 | 0.375 | 0.2 | 37.133 | 0.5652 | 0.1232 | 0.4867 | 0.1031 | 0.187 | 0.169 |
| MT880913\_ndhJ | *ndhJ* | 0.4067 | 0.5 | 0.3899 | 0.3 | 55.122 | 0.4724 | 0.1969 | 0.3929 | 0.2 | 0.163 | 0.302 |
| MT880913\_ndhK | *ndhK* | 0.3728 | 0.4 | 0.4495 | 0.3 | 50.451 | 0.5021 | 0.1328 | 0.4245 | 0.1623 | 0.166 | 0.23 |
| MT880913\_petA | *petA* | 0.3842 | 0.5 | 0.3551 | 0.3 | 52.514 | 0.5059 | 0.149 | 0.4032 | 0.1982 | 0.158 | 0.262 |
| MT880913\_petB | *petB* | 0.3873 | 0.5 | 0.412 | 0.3 | 41.964 | 0.55 | 0.1222 | 0.3789 | 0.1156 | 0.236 | 0.196 |
| MT880913\_petD | *petD* | 0.381 | 0.5 | 0.3851 | 0.2 | 40.467 | 0.4565 | 0.1159 | 0.4677 | 0.1391 | 0.177 | 0.209 |
| MT880913\_petG | *petG* | 0.3333 | 0.4 | 0.3158 | 0.2 | 37.429 | 0.5152 | 0.1515 | 0.3929 | 0.125 | 0.177 | 0.222 |
| MT880913\_petL | *petL* | 0.3021 | 0.4 | 0.4062 | 0.1 | 49.1 | 0.5172 | 0.1034 | 0.4615 | 0 | 0.104 | 0.1 |
| MT880913\_petN | *petN* | 0.4333 | 0.5 | 0.4333 | 0.4 | 29.305 | 0.36 | 0.2 | 0.4545 | 0.0476 | 0.121 | 0.24 |
| MT880913\_psaA | *psaA* | 0.4172 | 0.5 | 0.4301 | 0.3 | 47.55 | 0.4743 | 0.1716 | 0.4137 | 0.1449 | 0.196 | 0.255 |
| MT880913\_psaB | *psaB* | 0.4063 | 0.5 | 0.4327 | 0.3 | 47.717 | 0.492 | 0.1635 | 0.3969 | 0.1606 | 0.177 | 0.257 |
| MT880913\_psaC | *psaC* | 0.4065 | 0.4 | 0.5366 | 0.2 | 46.706 | 0.4697 | 0.1364 | 0.5263 | 0.1132 | 0.177 | 0.197 |
| MT880913\_psaI | *psaI* | 0.3158 | 0.4 | 0.2895 | 0.3 | 41.901 | 0.5313 | 0.1563 | 0.3846 | 0.1364 | 0.19 | 0.229 |
| MT880913\_psaJ | *psaJ* | 0.3566 | 0.4 | 0.3953 | 0.2 | 29.68 | 0.3947 | 0.1053 | 0.5484 | 0.1379 | 0.147 | 0.2 |
| MT880913\_psbA | *psbA* | 0.4134 | 0.5 | 0.435 | 0.3 | 40.078 | 0.5724 | 0.2171 | 0.2857 | 0.0856 | 0.327 | 0.257 |
| MT880913\_psbB | *psbB* | 0.427 | 0.6 | 0.4597 | 0.3 | 45.898 | 0.5266 | 0.1409 | 0.3935 | 0.1333 | 0.191 | 0.222 |
| MT880913\_psbC | *psbC* | 0.4325 | 0.5 | 0.4599 | 0.3 | 44.386 | 0.4691 | 0.1827 | 0.3853 | 0.1455 | 0.195 | 0.272 |
| MT880913\_psbD | *psbD* | 0.42 | 0.5 | 0.4322 | 0.3 | 45.251 | 0.5251 | 0.1839 | 0.3592 | 0.1342 | 0.253 | 0.26 |
| MT880913\_psbE | *psbE* | 0.4246 | 0.4 | 0.4762 | 0.4 | 46.662 | 0.4384 | 0.274 | 0.3492 | 0.1111 | 0.18 | 0.325 |
| MT880913\_psbF | *psbF* | 0.4167 | 0.5 | 0.45 | 0.4 | 61 | 0.3824 | 0.1471 | 0.4 | 0.2308 | 0.141 | 0.306 |
| MT880913\_psbH | *psbH* | 0.4009 | 0.4 | 0.4595 | 0.3 | 38.154 | 0.5 | 0.0484 | 0.35 | 0.25 | 0.174 | 0.246 |
| MT880913\_psbI | *psbI* | 0.3423 | 0.5 | 0.2973 | 0.2 | 24.769 | 0.5 | 0.1875 | 0.48 | 0.0435 | 0.195 | 0.2 |
| MT880913\_psbJ | *psbJ* | 0.3821 | 0.4 | 0.4878 | 0.2 | 29.589 | 0.5526 | 0.0526 | 0.3333 | 0.1481 | 0.17 | 0.158 |
| MT880913\_psbK | *psbK* | 0.371 | 0.4 | 0.3387 | 0.4 | 45.009 | 0.5091 | 0.2545 | 0.2683 | 0.1389 | 0.132 | 0.328 |
| MT880913\_psbL | *psbL* | 0.2906 | 0.4 | 0.2564 | 0.3 | 39.015 | 0.5313 | 0.1875 | 0.4583 | 0.087 | 0.17 | 0.222 |
| MT880913\_psbM | *psbM* | 0.2952 | 0.5 | 0.2571 | 0.2 | 47.167 | 0.6333 | 0.1333 | 0.3462 | 0.0476 | 0.213 | 0.152 |
| MT880913\_psbN | *psbN* | 0.447 | 0.6 | 0.4091 | 0.4 | 37.165 | 0.3611 | 0.25 | 0.4545 | 0.1613 | 0.136 | 0.333 |
| MT880913\_psbT | *psbT* | 0.2843 | 0.3 | 0.3529 | 0.2 | 47.385 | 0.5185 | 0.0741 | 0.5 | 0.1364 | 0.191 | 0.156 |
| MT880913\_psbZ | *psbZ* | 0.3545 | 0.4 | 0.4127 | 0.3 | 59.38 | 0.5263 | 0.1404 | 0.28 | 0.1667 | 0.214 | 0.254 |
| MT880913\_rbcL | *rbcL* | 0.4422 | 0.6 | 0.4415 | 0.3 | 48.905 | 0.4925 | 0.191 | 0.3874 | 0.1633 | 0.259 | 0.281 |
| MT880913\_rpl14 | *rpl14* | 0.3875 | 0.5 | 0.3902 | 0.2 | 44.9 | 0.4175 | 0.1553 | 0.5 | 0.1446 | 0.154 | 0.233 |
| MT880913\_rpl16 | *rpl16* | 0.4142 | 0.5 | 0.5147 | 0.2 | 39.827 | 0.4286 | 0.1143 | 0.5351 | 0.0891 | 0.146 | 0.165 |
| MT880913\_rpl2 | *rpl2* | 0.4315 | 0.5 | 0.48 | 0.3 | 54.56 | 0.3966 | 0.1853 | 0.448 | 0.1709 | 0.135 | 0.287 |
| MT880913\_rpl2-2 | *rpl2* | 0.4315 | 0.5 | 0.48 | 0.3 | 54.56 | 0.3966 | 0.1853 | 0.448 | 0.1709 | 0.135 | 0.287 |
| MT880913\_rpl20 | *rpl20* | 0.3729 | 0.4 | 0.4237 | 0.3 | 51.485 | 0.4242 | 0.1212 | 0.4719 | 0.2179 | 0.091 | 0.257 |
| MT880913\_rpl22 | *rpl22* | 0.3375 | 0.4 | 0.3851 | 0.2 | 47.916 | 0.4516 | 0.1855 | 0.5641 | 0.0849 | 0.169 | 0.208 |
| MT880913\_rpl23 | *rpl23* | 0.3688 | 0.4 | 0.383 | 0.3 | 54.145 | 0.4521 | 0.1507 | 0.4571 | 0.1774 | 0.124 | 0.253 |
| MT880913\_rpl23-2 | *rpl23* | 0.3688 | 0.4 | 0.383 | 0.3 | 54.145 | 0.4521 | 0.1507 | 0.4571 | 0.1774 | 0.124 | 0.253 |
| MT880913\_rpl32 | *rpl32* | 0.3019 | 0.3 | 0.434 | 0.2 | 39.62 | 0.5714 | 0.0571 | 0.4884 | 0.15 | 0.252 | 0.163 |
| MT880913\_rpl33 | *rpl33* | 0.3532 | 0.4 | 0.3881 | 0.3 | 40.755 | 0.5098 | 0.1765 | 0.4082 | 0.2381 | 0.178 | 0.292 |
| MT880913\_rpl36 | *rpl36* | 0.386 | 0.4 | 0.4737 | 0.3 | 26.459 | 0.3793 | 0.1379 | 0.4839 | 0.24 | 0.101 | 0.278 |
| MT880913\_rpoA | *rpoA* | 0.3384 | 0.5 | 0.3018 | 0.3 | 48.69 | 0.471 | 0.1699 | 0.5021 | 0.1553 | 0.149 | 0.238 |
| MT880913\_rpoB | *rpoB* | 0.3861 | 0.5 | 0.3765 | 0.3 | 49.143 | 0.4613 | 0.1279 | 0.4504 | 0.2192 | 0.148 | 0.26 |
| MT880913\_rpoC1 | *rpoC1* | 0.374 | 0.5 | 0.3735 | 0.3 | 47.113 | 0.4881 | 0.1371 | 0.4709 | 0.1758 | 0.154 | 0.233 |
| MT880913\_rpoC2 | *rpoC2* | 0.3675 | 0.5 | 0.367 | 0.3 | 48.908 | 0.4588 | 0.1594 | 0.4525 | 0.1914 | 0.15 | 0.263 |
| MT880913\_rps11 | *rps11* | 0.4293 | 0.5 | 0.5683 | 0.2 | 41.91 | 0.4262 | 0.1066 | 0.5259 | 0.0755 | 0.14 | 0.157 |
| MT880913\_rps12 | *rps12* | 0.4328 | 0.5 | 0.4758 | 0.3 | 47.656 | 0.3689 | 0.1942 | 0.4667 | 0.1546 | 0.129 | 0.287 |
| MT880913\_rps12-2 | *rps12* | 0.4328 | 0.5 | 0.4758 | 0.3 | 47.656 | 0.3689 | 0.1942 | 0.4667 | 0.1546 | 0.129 | 0.287 |
| MT880913\_rps14 | *rps14* | 0.4224 | 0.4 | 0.4752 | 0.3 | 45.961 | 0.36 | 0.12 | 0.4634 | 0.2857 | 0.134 | 0.323 |
| MT880913\_rps15 | *rps15* | 0.3146 | 0.4 | 0.3034 | 0.2 | 40.908 | 0.4531 | 0.0938 | 0.5352 | 0.2154 | 0.166 | 0.23 |
| MT880913\_rps16 | *rps16* | 0.3521 | 0.5 | 0.3708 | 0.2 | 47.797 | 0.5211 | 0.0986 | 0.4714 | 0.1587 | 0.148 | 0.195 |
| MT880913\_rps18 | *rps18* | 0.3366 | 0.3 | 0.4314 | 0.2 | 36.373 | 0.5063 | 0.1013 | 0.4302 | 0.1818 | 0.111 | 0.222 |
| MT880913\_rps19 | *rps19* | 0.3405 | 0.4 | 0.3763 | 0.2 | 47.677 | 0.44 | 0.1333 | 0.5352 | 0.1356 | 0.118 | 0.202 |
| MT880913\_rps2 | *rps2* | 0.3769 | 0.4 | 0.4219 | 0.3 | 47.886 | 0.487 | 0.1399 | 0.4205 | 0.2026 | 0.173 | 0.257 |
| MT880913\_rps3 | *rps3* | 0.3318 | 0.5 | 0.3333 | 0.2 | 42.278 | 0.4969 | 0.1698 | 0.5434 | 0.0699 | 0.182 | 0.176 |
| MT880913\_rps4 | *rps4* | 0.3812 | 0.5 | 0.3663 | 0.3 | 47.907 | 0.475 | 0.1563 | 0.454 | 0.1533 | 0.154 | 0.242 |
| MT880913\_rps7 | *rps7* | 0.4081 | 0.5 | 0.4551 | 0.2 | 45.752 | 0.405 | 0.157 | 0.5231 | 0.1176 | 0.187 | 0.22 |
| MT880913\_rps7-2 | *rps7* | 0.4081 | 0.5 | 0.4551 | 0.2 | 45.752 | 0.405 | 0.157 | 0.5231 | 0.1176 | 0.187 | 0.22 |
| MT880913\_rps8 | *rps8* | 0.358 | 0.4 | 0.3926 | 0.3 | 40.947 | 0.3636 | 0.2 | 0.4907 | 0.1744 | 0.117 | 0.285 |
| MT880913\_ycf1 | *ycf1* | 0.3404 | 0.4 | 0.2979 | 0.3 | 47.076 | 0.4358 | 0.2128 | 0.469 | 0.193 | 0.171 | 0.3 |
| MT880913\_ycf1-2 | *ycf1* | 0.2919 | 0.3 | 0.2885 | 0.2 | 56.285 | 0.4911 | 0.174 | 0.5615 | 0.1248 | 0.181 | 0.212 |
| MT880913\_ycf2 | *ycf2* | 0.3738 | 0.4 | 0.3444 | 0.4 | 52.895 | 0.4474 | 0.2054 | 0.3981 | 0.2645 | 0.155 | 0.34 |
| MT880913\_ycf2-2 | *ycf2* | 0.3738 | 0.4 | 0.3444 | 0.4 | 52.895 | 0.4474 | 0.2054 | 0.3981 | 0.2645 | 0.155 | 0.34 |
| MT880913\_ycf3 | *ycf3* | 0.3905 | 0.5 | 0.3905 | 0.3 | 56.437 | 0.4848 | 0.1742 | 0.4492 | 0.1923 | 0.172 | 0.269 |
| MT880913\_ycf4 | *ycf4* | 0.3766 | 0.4 | 0.4162 | 0.3 | 46.465 | 0.5232 | 0.1457 | 0.3741 | 0.1795 | 0.167 | 0.247 |
| MT880914\_accD | *accD* | 0.343 | 0.4 | 0.3629 | 0.3 | 45.185 | 0.5954 | 0.1521 | 0.3495 | 0.2 | 0.2 | 0.254 |
| MT880914\_atpA | *atpA* | 0.4022 | 0.5 | 0.3976 | 0.3 | 45.682 | 0.4675 | 0.1675 | 0.4279 | 0.151 | 0.197 | 0.252 |
| MT880914\_atpB | *atpB* | 0.4261 | 0.6 | 0.3976 | 0.3 | 48.992 | 0.4289 | 0.1863 | 0.4243 | 0.1747 | 0.205 | 0.29 |
| MT880914\_atpE | *atpE* | 0.3935 | 0.5 | 0.391 | 0.3 | 50.96 | 0.4623 | 0.1509 | 0.434 | 0.1739 | 0.168 | 0.252 |
| MT880914\_atpF | *atpF* | 0.355 | 0.4 | 0.3243 | 0.3 | 43.912 | 0.4384 | 0.1781 | 0.4745 | 0.2016 | 0.158 | 0.283 |
| MT880914\_atpH | *atpH* | 0.4431 | 0.6 | 0.4878 | 0.2 | 43.802 | 0.5634 | 0.0423 | 0.3151 | 0.194 | 0.191 | 0.203 |
| MT880914\_atpI | *atpI* | 0.3773 | 0.5 | 0.356 | 0.3 | 48.062 | 0.4502 | 0.1991 | 0.4337 | 0.1111 | 0.17 | 0.253 |
| MT880914\_ccsA | *ccsA* | 0.2948 | 0.3 | 0.3435 | 0.2 | 41.209 | 0.5197 | 0.1147 | 0.4846 | 0.1176 | 0.15 | 0.175 |
| MT880914\_cemA | *cemA* | 0.3101 | 0.4 | 0.2739 | 0.3 | 45.683 | 0.5333 | 0.1833 | 0.4387 | 0.1667 | 0.202 | 0.248 |
| MT880914\_clpP | *clpP* | 0.4027 | 0.5 | 0.3807 | 0.3 | 50.912 | 0.4268 | 0.1911 | 0.4733 | 0.1298 | 0.157 | 0.254 |
| MT880914\_matK | *matK* | 0.3112 | 0.4 | 0.2998 | 0.3 | 50.897 | 0.4966 | 0.1402 | 0.4818 | 0.2057 | 0.144 | 0.245 |
| MT880914\_ndhA | *ndhA* | 0.3343 | 0.4 | 0.385 | 0.2 | 42.152 | 0.4712 | 0.1218 | 0.4861 | 0.095 | 0.129 | 0.175 |
| MT880914\_ndhB | *ndhB* | 0.3697 | 0.4 | 0.384 | 0.3 | 46.149 | 0.4412 | 0.2059 | 0.4278 | 0.1242 | 0.161 | 0.268 |
| MT880914\_ndhB-2 | *ndhB* | 0.3697 | 0.4 | 0.384 | 0.3 | 46.149 | 0.4412 | 0.2059 | 0.4278 | 0.1242 | 0.161 | 0.268 |
| MT880914\_ndhC | *ndhC* | 0.3609 | 0.5 | 0.3471 | 0.3 | 50.035 | 0.5248 | 0.0891 | 0.4045 | 0.1842 | 0.201 | 0.205 |
| MT880914\_ndhD | *ndhD* | 0.3371 | 0.4 | 0.3619 | 0.3 | 48.059 | 0.4825 | 0.155 | 0.4215 | 0.1325 | 0.139 | 0.228 |
| MT880914\_ndhE | *ndhE* | 0.3333 | 0.4 | 0.3235 | 0.3 | 54.17 | 0.5169 | 0.1573 | 0.3836 | 0.1475 | 0.143 | 0.237 |
| MT880914\_ndhF | *ndhF* | 0.3017 | 0.4 | 0.3494 | 0.2 | 42.106 | 0.5443 | 0.0995 | 0.474 | 0.1156 | 0.141 | 0.162 |
| MT880914\_ndhG | *ndhG* | 0.3427 | 0.4 | 0.3446 | 0.2 | 47.177 | 0.4907 | 0.1056 | 0.4167 | 0.1712 | 0.123 | 0.212 |
| MT880914\_ndhH | *ndhH* | 0.3697 | 0.5 | 0.3623 | 0.2 | 46.877 | 0.5049 | 0.1165 | 0.5118 | 0.1197 | 0.157 | 0.179 |
| MT880914\_ndhI | *ndhI* | 0.3353 | 0.4 | 0.375 | 0.2 | 38.404 | 0.5652 | 0.1377 | 0.469 | 0.1031 | 0.185 | 0.181 |
| MT880914\_ndhJ | *ndhJ* | 0.4025 | 0.5 | 0.3899 | 0.3 | 53.981 | 0.4882 | 0.189 | 0.3929 | 0.19 | 0.164 | 0.289 |
| MT880914\_ndhK | *ndhK* | 0.3694 | 0.4 | 0.4286 | 0.3 | 48.477 | 0.5142 | 0.1321 | 0.4346 | 0.16 | 0.171 | 0.226 |
| MT880914\_petA | *petA* | 0.3832 | 0.5 | 0.3551 | 0.3 | 52.73 | 0.502 | 0.1451 | 0.4071 | 0.2027 | 0.156 | 0.262 |
| MT880914\_petB | *petB* | 0.3873 | 0.5 | 0.412 | 0.3 | 41.664 | 0.55 | 0.1278 | 0.3789 | 0.1088 | 0.229 | 0.196 |
| MT880914\_petD | *petD* | 0.381 | 0.5 | 0.3913 | 0.2 | 39.293 | 0.4638 | 0.1159 | 0.4677 | 0.1304 | 0.174 | 0.203 |
| MT880914\_petG | *petG* | 0.3421 | 0.4 | 0.3158 | 0.3 | 37.923 | 0.5152 | 0.1818 | 0.3571 | 0.125 | 0.199 | 0.25 |
| MT880914\_petL | *petL* | 0.3125 | 0.4 | 0.4375 | 0.1 | 45.667 | 0.5172 | 0.1034 | 0.4615 | 0 | 0.11 | 0.1 |
| MT880914\_petN | *petN* | 0.4333 | 0.5 | 0.4333 | 0.4 | 29.305 | 0.36 | 0.2 | 0.4545 | 0.0476 | 0.121 | 0.24 |
| MT880914\_psaA | *psaA* | 0.4172 | 0.5 | 0.4301 | 0.3 | 47.465 | 0.4758 | 0.1716 | 0.4119 | 0.1449 | 0.193 | 0.255 |
| MT880914\_psaB | *psaB* | 0.4054 | 0.5 | 0.4299 | 0.3 | 47.752 | 0.4888 | 0.1651 | 0.4023 | 0.1591 | 0.176 | 0.257 |
| MT880914\_psaC | *psaC* | 0.4146 | 0.5 | 0.5366 | 0.3 | 47.595 | 0.4697 | 0.1515 | 0.5179 | 0.1154 | 0.19 | 0.211 |
| MT880914\_psaI | *psaI* | 0.3158 | 0.4 | 0.2895 | 0.3 | 41.901 | 0.5313 | 0.1563 | 0.3846 | 0.1364 | 0.19 | 0.229 |
| MT880914\_psaJ | *psaJ* | 0.3488 | 0.4 | 0.3953 | 0.2 | 29.68 | 0.3947 | 0.0789 | 0.5806 | 0.1379 | 0.127 | 0.175 |
| MT880914\_psbA | *psbA* | 0.4134 | 0.5 | 0.435 | 0.3 | 40.096 | 0.5724 | 0.2204 | 0.2857 | 0.0811 | 0.328 | 0.257 |
| MT880914\_psbB | *psbB* | 0.4322 | 0.6 | 0.4597 | 0.3 | 46.814 | 0.5196 | 0.1478 | 0.3811 | 0.1478 | 0.184 | 0.239 |
| MT880914\_psbC | *psbC* | 0.4332 | 0.5 | 0.4599 | 0.3 | 44.575 | 0.4593 | 0.1901 | 0.3938 | 0.1394 | 0.191 | 0.275 |
| MT880914\_psbD | *psbD* | 0.42 | 0.5 | 0.4322 | 0.3 | 44.512 | 0.5251 | 0.1873 | 0.3633 | 0.1255 | 0.254 | 0.257 |
| MT880914\_psbE | *psbE* | 0.4246 | 0.4 | 0.4762 | 0.4 | 48.566 | 0.4521 | 0.274 | 0.3333 | 0.1111 | 0.186 | 0.325 |
| MT880914\_psbF | *psbF* | 0.4167 | 0.5 | 0.45 | 0.4 | 61 | 0.3824 | 0.1471 | 0.4 | 0.2308 | 0.141 | 0.306 |
| MT880914\_psbH | *psbH* | 0.3919 | 0.4 | 0.4595 | 0.3 | 36.929 | 0.5246 | 0.0492 | 0.3559 | 0.2182 | 0.178 | 0.221 |
| MT880914\_psbI | *psbI* | 0.3333 | 0.5 | 0.2973 | 0.2 | 24.465 | 0.5313 | 0.1563 | 0.48 | 0.0435 | 0.188 | 0.171 |
| MT880914\_psbJ | *psbJ* | 0.3821 | 0.4 | 0.4878 | 0.2 | 29.051 | 0.5526 | 0.0789 | 0.3333 | 0.1111 | 0.172 | 0.158 |
| MT880914\_psbK | *psbK* | 0.3817 | 0.4 | 0.3387 | 0.4 | 42.887 | 0.4909 | 0.2545 | 0.2683 | 0.1622 | 0.131 | 0.345 |
| MT880914\_psbL | *psbL* | 0.2906 | 0.4 | 0.2564 | 0.3 | 39.015 | 0.5313 | 0.1875 | 0.4583 | 0.087 | 0.17 | 0.222 |
| MT880914\_psbM | *psbM* | 0.2952 | 0.5 | 0.2571 | 0.2 | 41.167 | 0.6667 | 0.1333 | 0.3077 | 0.0476 | 0.231 | 0.152 |
| MT880914\_psbN | *psbN* | 0.447 | 0.6 | 0.4091 | 0.4 | 37.165 | 0.3611 | 0.25 | 0.4545 | 0.1613 | 0.136 | 0.333 |
| MT880914\_psbT | *psbT* | 0.2941 | 0.3 | 0.3529 | 0.2 | 47.385 | 0.4815 | 0.1111 | 0.5 | 0.1364 | 0.19 | 0.188 |
| MT880914\_psbZ | *psbZ* | 0.3492 | 0.4 | 0.4127 | 0.3 | 57.443 | 0.5439 | 0.1404 | 0.28 | 0.1429 | 0.229 | 0.237 |
| MT880914\_rbcL | *rbcL* | 0.4415 | 0.6 | 0.4394 | 0.3 | 48.888 | 0.4937 | 0.1914 | 0.3874 | 0.1633 | 0.258 | 0.281 |
| MT880914\_rpl14 | *rpl14* | 0.3875 | 0.5 | 0.3902 | 0.2 | 46.004 | 0.4078 | 0.1553 | 0.5102 | 0.1446 | 0.151 | 0.233 |
| MT880914\_rpl16 | *rpl16* | 0.4142 | 0.5 | 0.5147 | 0.2 | 39.193 | 0.4286 | 0.1238 | 0.5351 | 0.0792 | 0.149 | 0.165 |
| MT880914\_rpl2 | *rpl2* | 0.4327 | 0.5 | 0.4836 | 0.3 | 54.279 | 0.3966 | 0.1853 | 0.448 | 0.1709 | 0.135 | 0.287 |
| MT880914\_rpl2-2 | *rpl2* | 0.4327 | 0.5 | 0.4836 | 0.3 | 54.279 | 0.3966 | 0.1853 | 0.448 | 0.1709 | 0.135 | 0.287 |
| MT880914\_rpl20 | *rpl20* | 0.3701 | 0.4 | 0.4322 | 0.3 | 51.935 | 0.42 | 0.12 | 0.4778 | 0.2152 | 0.091 | 0.254 |
| MT880914\_rpl22 | *rpl22* | 0.3395 | 0.4 | 0.3851 | 0.2 | 48.762 | 0.4597 | 0.1774 | 0.5508 | 0.1028 | 0.165 | 0.213 |
| MT880914\_rpl23 | *rpl23* | 0.3688 | 0.4 | 0.383 | 0.3 | 53.869 | 0.4521 | 0.1507 | 0.4571 | 0.1774 | 0.127 | 0.253 |
| MT880914\_rpl23-2 | *rpl23* | 0.3688 | 0.4 | 0.383 | 0.3 | 53.869 | 0.4521 | 0.1507 | 0.4571 | 0.1774 | 0.127 | 0.253 |
| MT880914\_rpl32 | *rpl32* | 0.3145 | 0.3 | 0.434 | 0.2 | 39.62 | 0.5429 | 0.0857 | 0.4651 | 0.175 | 0.243 | 0.204 |
| MT880914\_rpl33 | *rpl33* | 0.3582 | 0.4 | 0.3881 | 0.3 | 40.649 | 0.4902 | 0.1961 | 0.4082 | 0.2381 | 0.187 | 0.308 |
| MT880914\_rpl36 | *rpl36* | 0.3947 | 0.4 | 0.4737 | 0.3 | 21.459 | 0.3793 | 0.1379 | 0.4516 | 0.28 | 0.103 | 0.306 |
| MT880914\_rpoA | *rpoA* | 0.3354 | 0.5 | 0.2988 | 0.3 | 48.478 | 0.469 | 0.1628 | 0.5145 | 0.1553 | 0.149 | 0.232 |
| MT880914\_rpoB | *rpoB* | 0.3858 | 0.5 | 0.3765 | 0.3 | 48.856 | 0.4642 | 0.1293 | 0.451 | 0.2141 | 0.15 | 0.258 |
| MT880914\_rpoC1 | *rpoC1* | 0.3735 | 0.5 | 0.3735 | 0.3 | 47.193 | 0.4899 | 0.1408 | 0.4729 | 0.167 | 0.155 | 0.23 |
| MT880914\_rpoC2 | *rpoC2* | 0.3677 | 0.5 | 0.3672 | 0.3 | 49.446 | 0.4566 | 0.1622 | 0.452 | 0.1925 | 0.149 | 0.266 |
| MT880914\_rps11 | *rps11* | 0.4317 | 0.5 | 0.5683 | 0.2 | 41.847 | 0.4344 | 0.1148 | 0.5086 | 0.0755 | 0.138 | 0.164 |
| MT880914\_rps12 | *rps12* | 0.4355 | 0.5 | 0.4758 | 0.3 | 48.167 | 0.3689 | 0.1942 | 0.4571 | 0.1649 | 0.131 | 0.295 |
| MT880914\_rps12-2 | *rps12* | 0.4355 | 0.5 | 0.4758 | 0.3 | 48.167 | 0.3689 | 0.1942 | 0.4571 | 0.1649 | 0.131 | 0.295 |
| MT880914\_rps14 | *rps14* | 0.4125 | 0.4 | 0.4752 | 0.3 | 45.923 | 0.3733 | 0.12 | 0.4512 | 0.2895 | 0.135 | 0.323 |
| MT880914\_rps15 | *rps15* | 0.3071 | 0.4 | 0.3034 | 0.2 | 42.408 | 0.4688 | 0.0625 | 0.5493 | 0.2154 | 0.156 | 0.207 |
| MT880914\_rps16 | *rps16* | 0.3521 | 0.5 | 0.382 | 0.2 | 46.813 | 0.5417 | 0.0833 | 0.4571 | 0.1563 | 0.142 | 0.184 |
| MT880914\_rps18 | *rps18* | 0.3366 | 0.3 | 0.4314 | 0.2 | 36.373 | 0.5063 | 0.1013 | 0.4302 | 0.1818 | 0.111 | 0.222 |
| MT880914\_rps19 | *rps19* | 0.3477 | 0.4 | 0.3763 | 0.2 | 51.797 | 0.4267 | 0.1333 | 0.5211 | 0.1695 | 0.126 | 0.225 |
| MT880914\_rps2 | *rps2* | 0.3769 | 0.4 | 0.4219 | 0.3 | 48.096 | 0.487 | 0.1347 | 0.4237 | 0.2013 | 0.172 | 0.252 |
| MT880914\_rps3 | *rps3* | 0.3242 | 0.5 | 0.3242 | 0.2 | 39.397 | 0.4937 | 0.1582 | 0.5575 | 0.0699 | 0.177 | 0.167 |
| MT880914\_rps4 | *rps4* | 0.3828 | 0.5 | 0.3663 | 0.3 | 48.522 | 0.475 | 0.1625 | 0.4479 | 0.1533 | 0.151 | 0.247 |
| MT880914\_rps7 | *rps7* | 0.4081 | 0.5 | 0.4551 | 0.2 | 45.752 | 0.405 | 0.157 | 0.5231 | 0.1176 | 0.187 | 0.22 |
| MT880914\_rps7-2 | *rps7* | 0.4081 | 0.5 | 0.4551 | 0.2 | 45.752 | 0.405 | 0.157 | 0.5231 | 0.1176 | 0.187 | 0.22 |
| MT880914\_rps8 | *rps8* | 0.3531 | 0.4 | 0.3926 | 0.3 | 40.168 | 0.3636 | 0.1909 | 0.5093 | 0.1628 | 0.112 | 0.269 |
| MT880914\_ycf1 | *ycf1* | 0.3404 | 0.4 | 0.2979 | 0.3 | 45.913 | 0.4358 | 0.2162 | 0.4708 | 0.1894 | 0.173 | 0.3 |
| MT880914\_ycf1-2 | *ycf1* | 0.2877 | 0.3 | 0.2804 | 0.2 | 56.204 | 0.5012 | 0.1632 | 0.5677 | 0.1227 | 0.178 | 0.202 |
| MT880914\_ycf2 | *ycf2* | 0.3732 | 0.4 | 0.3428 | 0.4 | 52.908 | 0.4471 | 0.2063 | 0.3969 | 0.265 | 0.156 | 0.341 |
| MT880914\_ycf2-2 | *ycf2* | 0.3732 | 0.4 | 0.3428 | 0.4 | 52.908 | 0.4471 | 0.2063 | 0.3969 | 0.265 | 0.156 | 0.341 |
| MT880914\_ycf3 | *ycf3* | 0.3886 | 0.5 | 0.3905 | 0.3 | 55.203 | 0.4924 | 0.1667 | 0.4492 | 0.1923 | 0.172 | 0.263 |
| MT880914\_ycf4 | *ycf4* | 0.3766 | 0.4 | 0.4162 | 0.3 | 46.436 | 0.5132 | 0.1513 | 0.3786 | 0.1795 | 0.172 | 0.251 |
| NC\_009273\_accD | *accD* | 0.3415 | 0.4 | 0.3586 | 0.3 | 44.554 | 0.5979 | 0.1469 | 0.3514 | 0.2047 | 0.201 | 0.253 |
| NC\_009273\_atpA | *atpA* | 0.4049 | 0.5 | 0.3976 | 0.3 | 45.411 | 0.4625 | 0.175 | 0.4256 | 0.151 | 0.197 | 0.258 |
| NC\_009273\_atpB | *atpB* | 0.4254 | 0.6 | 0.3976 | 0.3 | 48.606 | 0.4314 | 0.1838 | 0.4243 | 0.1747 | 0.205 | 0.287 |
| NC\_009273\_atpE | *atpE* | 0.3935 | 0.5 | 0.391 | 0.3 | 50.96 | 0.4623 | 0.1509 | 0.434 | 0.1739 | 0.168 | 0.252 |
| NC\_009273\_atpF | *atpF* | 0.3532 | 0.4 | 0.3189 | 0.3 | 43.401 | 0.4414 | 0.1793 | 0.4745 | 0.2016 | 0.163 | 0.283 |
| NC\_009273\_atpH | *atpH* | 0.4431 | 0.6 | 0.4878 | 0.2 | 43.802 | 0.5634 | 0.0423 | 0.3151 | 0.194 | 0.191 | 0.203 |
| NC\_009273\_atpI | *atpI* | 0.38 | 0.5 | 0.36 | 0.3 | 48.378 | 0.4455 | 0.2038 | 0.4337 | 0.1111 | 0.168 | 0.257 |
| NC\_009273\_ccsA | *ccsA* | 0.2969 | 0.3 | 0.3495 | 0.2 | 41.625 | 0.516 | 0.1139 | 0.489 | 0.1123 | 0.149 | 0.172 |
| NC\_009273\_cemA | *cemA* | 0.313 | 0.4 | 0.2826 | 0.3 | 45.924 | 0.5333 | 0.1833 | 0.4387 | 0.1654 | 0.201 | 0.248 |
| NC\_009273\_clpP | *clpP* | 0.4027 | 0.5 | 0.3807 | 0.3 | 50.912 | 0.4268 | 0.1911 | 0.4733 | 0.1298 | 0.157 | 0.254 |
| NC\_009273\_matK | *matK* | 0.3118 | 0.4 | 0.2979 | 0.3 | 50.264 | 0.5023 | 0.1399 | 0.4761 | 0.2077 | 0.149 | 0.245 |
| NC\_009273\_ndhA | *ndhA* | 0.3352 | 0.4 | 0.385 | 0.2 | 42.218 | 0.4712 | 0.1218 | 0.4861 | 0.095 | 0.129 | 0.175 |
| NC\_009273\_ndhB | *ndhB* | 0.3717 | 0.4 | 0.3899 | 0.3 | 46.046 | 0.4369 | 0.2056 | 0.4313 | 0.1205 | 0.159 | 0.267 |
| NC\_009273\_ndhB-2 | *ndhB* | 0.3717 | 0.4 | 0.3899 | 0.3 | 46.046 | 0.4369 | 0.2056 | 0.4313 | 0.1205 | 0.159 | 0.267 |
| NC\_009273\_ndhC | *ndhC* | 0.3609 | 0.5 | 0.3471 | 0.3 | 50.154 | 0.5248 | 0.0891 | 0.4045 | 0.1842 | 0.201 | 0.205 |
| NC\_009273\_ndhD | *ndhD* | 0.34 | 0.4 | 0.3685 | 0.3 | 47.551 | 0.4839 | 0.1567 | 0.4305 | 0.1176 | 0.142 | 0.22 |
| NC\_009273\_ndhE | *ndhE* | 0.3301 | 0.4 | 0.3235 | 0.3 | 56.33 | 0.5169 | 0.1573 | 0.3973 | 0.1311 | 0.145 | 0.227 |
| NC\_009273\_ndhF | *ndhF* | 0.3061 | 0.4 | 0.3494 | 0.2 | 43.435 | 0.5397 | 0.1026 | 0.4635 | 0.129 | 0.139 | 0.173 |
| NC\_009273\_ndhG | *ndhG* | 0.3446 | 0.4 | 0.3446 | 0.2 | 48.537 | 0.4907 | 0.1056 | 0.4091 | 0.1802 | 0.122 | 0.218 |
| NC\_009273\_ndhH | *ndhH* | 0.3697 | 0.5 | 0.3655 | 0.2 | 47.064 | 0.5115 | 0.1148 | 0.5052 | 0.119 | 0.158 | 0.177 |
| NC\_009273\_ndhI | *ndhI* | 0.3333 | 0.4 | 0.375 | 0.2 | 38.404 | 0.562 | 0.1314 | 0.4825 | 0.102 | 0.192 | 0.175 |
| NC\_009273\_ndhJ | *ndhJ* | 0.4046 | 0.5 | 0.3899 | 0.3 | 54.312 | 0.4803 | 0.1969 | 0.3929 | 0.19 | 0.166 | 0.295 |
| NC\_009273\_ndhK | *ndhK* | 0.3776 | 0.4 | 0.4513 | 0.2 | 47.739 | 0.5079 | 0.1152 | 0.4379 | 0.1548 | 0.162 | 0.212 |
| NC\_009273\_petA | *petA* | 0.3853 | 0.5 | 0.3551 | 0.3 | 52.37 | 0.5059 | 0.1451 | 0.3992 | 0.2072 | 0.156 | 0.265 |
| NC\_009273\_petB | *petB* | 0.3873 | 0.5 | 0.412 | 0.3 | 41.664 | 0.55 | 0.1278 | 0.3789 | 0.1088 | 0.229 | 0.196 |
| NC\_009273\_petD | *petD* | 0.381 | 0.5 | 0.3913 | 0.2 | 39.132 | 0.471 | 0.1159 | 0.4597 | 0.1304 | 0.174 | 0.203 |
| NC\_009273\_petG | *petG* | 0.3421 | 0.4 | 0.3158 | 0.3 | 37.923 | 0.5152 | 0.1818 | 0.3571 | 0.125 | 0.199 | 0.25 |
| NC\_009273\_petL | *petL* | 0.3125 | 0.4 | 0.4375 | 0.1 | 45.667 | 0.5172 | 0.1034 | 0.4615 | 0 | 0.11 | 0.1 |
| NC\_009273\_petN | *petN* | 0.4333 | 0.5 | 0.4333 | 0.4 | 29.305 | 0.36 | 0.2 | 0.4545 | 0.0476 | 0.121 | 0.24 |
| NC\_009273\_psaA | *psaA* | 0.4168 | 0.5 | 0.4301 | 0.3 | 47.361 | 0.4743 | 0.17 | 0.4156 | 0.1446 | 0.194 | 0.253 |
| NC\_009273\_psaB | *psaB* | 0.4036 | 0.5 | 0.4299 | 0.3 | 47.464 | 0.4904 | 0.1635 | 0.4063 | 0.1552 | 0.176 | 0.253 |
| NC\_009273\_psaC | *psaC* | 0.4146 | 0.5 | 0.5366 | 0.3 | 47.595 | 0.4697 | 0.1515 | 0.5179 | 0.1154 | 0.19 | 0.211 |
| NC\_009273\_psaI | *psaI* | 0.3158 | 0.4 | 0.2895 | 0.3 | 41.901 | 0.5313 | 0.1563 | 0.3846 | 0.1364 | 0.19 | 0.229 |
| NC\_009273\_psaJ | *psaJ* | 0.3488 | 0.4 | 0.3953 | 0.2 | 29.68 | 0.3947 | 0.0789 | 0.5806 | 0.1379 | 0.127 | 0.175 |
| NC\_009273\_psbA | *psbA* | 0.4134 | 0.5 | 0.435 | 0.3 | 40.096 | 0.5724 | 0.2204 | 0.2857 | 0.0811 | 0.328 | 0.257 |
| NC\_009273\_psbB | *psbB* | 0.4303 | 0.6 | 0.4597 | 0.3 | 46.786 | 0.5196 | 0.1432 | 0.3854 | 0.1474 | 0.182 | 0.235 |
| NC\_009273\_psbC | *psbC* | 0.4311 | 0.5 | 0.4599 | 0.3 | 44.151 | 0.4617 | 0.1877 | 0.3994 | 0.1333 | 0.191 | 0.268 |
| NC\_009273\_psbD | *psbD* | 0.419 | 0.5 | 0.4322 | 0.3 | 44.317 | 0.5284 | 0.1873 | 0.3592 | 0.1255 | 0.254 | 0.257 |
| NC\_009273\_psbE | *psbE* | 0.4286 | 0.4 | 0.4762 | 0.4 | 51.396 | 0.4384 | 0.2877 | 0.3333 | 0.1111 | 0.183 | 0.338 |
| NC\_009273\_psbF | *psbF* | 0.4167 | 0.5 | 0.45 | 0.4 | 61 | 0.3824 | 0.1471 | 0.4 | 0.2308 | 0.141 | 0.306 |
| NC\_009273\_psbH | *psbH* | 0.3919 | 0.4 | 0.4595 | 0.3 | 36.929 | 0.5246 | 0.0492 | 0.3559 | 0.2182 | 0.178 | 0.221 |
| NC\_009273\_psbI | *psbI* | 0.3333 | 0.5 | 0.2973 | 0.2 | 24.12 | 0.5484 | 0.1613 | 0.48 | 0.0417 | 0.222 | 0.171 |
| NC\_009273\_psbJ | *psbJ* | 0.374 | 0.4 | 0.4878 | 0.2 | 28.6 | 0.5789 | 0.0526 | 0.3333 | 0.1111 | 0.174 | 0.132 |
| NC\_009273\_psbK | *psbK* | 0.3817 | 0.4 | 0.3387 | 0.4 | 42.887 | 0.4909 | 0.2545 | 0.2683 | 0.1622 | 0.131 | 0.345 |
| NC\_009273\_psbL | *psbL* | 0.2906 | 0.4 | 0.2564 | 0.3 | 39.015 | 0.5313 | 0.1875 | 0.4583 | 0.087 | 0.17 | 0.222 |
| NC\_009273\_psbM | *psbM* | 0.3048 | 0.5 | 0.2571 | 0.2 | 47.167 | 0.6333 | 0.1333 | 0.3077 | 0.0952 | 0.215 | 0.182 |
| NC\_009273\_psbN | *psbN* | 0.447 | 0.6 | 0.4091 | 0.4 | 37.165 | 0.3611 | 0.25 | 0.4545 | 0.1613 | 0.136 | 0.333 |
| NC\_009273\_psbT | *psbT* | 0.2941 | 0.3 | 0.3529 | 0.2 | 47.385 | 0.4815 | 0.1111 | 0.5 | 0.1364 | 0.19 | 0.188 |
| NC\_009273\_psbZ | *psbZ* | 0.3492 | 0.4 | 0.4127 | 0.3 | 57.443 | 0.5439 | 0.1404 | 0.28 | 0.1429 | 0.229 | 0.237 |
| NC\_009273\_rbcL | *rbcL* | 0.4405 | 0.6 | 0.4384 | 0.3 | 47.843 | 0.4936 | 0.1934 | 0.3922 | 0.1543 | 0.264 | 0.277 |
| NC\_009273\_rpl14 | *rpl14* | 0.3875 | 0.5 | 0.3902 | 0.2 | 46.004 | 0.4078 | 0.1553 | 0.5102 | 0.1446 | 0.151 | 0.233 |
| NC\_009273\_rpl16 | *rpl16* | 0.4142 | 0.5 | 0.5147 | 0.2 | 40.74 | 0.4286 | 0.1143 | 0.5351 | 0.0891 | 0.146 | 0.165 |
| NC\_009273\_rpl2 | *rpl2* | 0.4339 | 0.5 | 0.4836 | 0.3 | 54.292 | 0.3966 | 0.1853 | 0.448 | 0.1709 | 0.136 | 0.287 |
| NC\_009273\_rpl2-2 | *rpl2* | 0.4339 | 0.5 | 0.4836 | 0.3 | 54.292 | 0.3966 | 0.1853 | 0.448 | 0.1709 | 0.136 | 0.287 |
| NC\_009273\_rpl20 | *rpl20* | 0.3672 | 0.4 | 0.4322 | 0.3 | 53.163 | 0.43 | 0.12 | 0.4778 | 0.2025 | 0.095 | 0.246 |
| NC\_009273\_rpl22 | *rpl22* | 0.3437 | 0.4 | 0.3913 | 0.2 | 48.533 | 0.456 | 0.184 | 0.547 | 0.1038 | 0.168 | 0.219 |
| NC\_009273\_rpl23 | *rpl23* | 0.3688 | 0.4 | 0.383 | 0.3 | 53.869 | 0.4521 | 0.1507 | 0.4571 | 0.1774 | 0.127 | 0.253 |
| NC\_009273\_rpl23-2 | *rpl23* | 0.3688 | 0.4 | 0.383 | 0.3 | 53.869 | 0.4521 | 0.1507 | 0.4571 | 0.1774 | 0.127 | 0.253 |
| NC\_009273\_rpl32 | *rpl32* | 0.3145 | 0.3 | 0.434 | 0.2 | 39.62 | 0.5429 | 0.0857 | 0.4651 | 0.175 | 0.243 | 0.204 |
| NC\_009273\_rpl33 | *rpl33* | 0.3582 | 0.4 | 0.3881 | 0.3 | 40.649 | 0.4902 | 0.1961 | 0.4082 | 0.2381 | 0.187 | 0.308 |
| NC\_009273\_rpl36 | *rpl36* | 0.3947 | 0.4 | 0.4737 | 0.3 | 21.459 | 0.3793 | 0.1379 | 0.4516 | 0.28 | 0.103 | 0.306 |
| NC\_009273\_rpoA | *rpoA* | 0.3364 | 0.5 | 0.2957 | 0.3 | 48.588 | 0.4669 | 0.1634 | 0.5125 | 0.161 | 0.15 | 0.236 |
| NC\_009273\_rpoB | *rpoB* | 0.3868 | 0.5 | 0.3765 | 0.3 | 49.304 | 0.4613 | 0.1303 | 0.4492 | 0.2182 | 0.149 | 0.261 |
| NC\_009273\_rpoC1 | *rpoC1* | 0.3759 | 0.5 | 0.3759 | 0.3 | 47.54 | 0.4852 | 0.1421 | 0.4728 | 0.1674 | 0.153 | 0.232 |
| NC\_009273\_rpoC2 | *rpoC2* | 0.3675 | 0.5 | 0.3683 | 0.3 | 49.217 | 0.4583 | 0.1634 | 0.4495 | 0.192 | 0.149 | 0.266 |
| NC\_009273\_rps11 | *rps11* | 0.4293 | 0.5 | 0.5683 | 0.2 | 41.349 | 0.4426 | 0.1066 | 0.5086 | 0.0755 | 0.138 | 0.157 |
| NC\_009273\_rps12 | *rps12* | 0.4355 | 0.5 | 0.4758 | 0.3 | 48.167 | 0.3689 | 0.1942 | 0.4571 | 0.1649 | 0.131 | 0.295 |
| NC\_009273\_rps12-2 | *rps12* | 0.4355 | 0.5 | 0.4758 | 0.3 | 48.167 | 0.3689 | 0.1942 | 0.4571 | 0.1649 | 0.131 | 0.295 |
| NC\_009273\_rps14 | *rps14* | 0.3875 | 0.5 | 0.3902 | 0.2 | 45.815 | 0.3733 | 0.12 | 0.4512 | 0.2895 | 0.137 | 0.323 |
| NC\_009273\_rps15 | *rps15* | 0.3034 | 0.4 | 0.2921 | 0.2 | 39.869 | 0.4688 | 0.0625 | 0.5493 | 0.2188 | 0.157 | 0.207 |
| NC\_009273\_rps16 | *rps16* | 0.3521 | 0.5 | 0.382 | 0.2 | 46.813 | 0.5417 | 0.0833 | 0.4571 | 0.1563 | 0.142 | 0.184 |
| NC\_009273\_rps18 | *rps18* | 0.3399 | 0.3 | 0.4314 | 0.3 | 36.881 | 0.5 | 0.1125 | 0.4235 | 0.1842 | 0.111 | 0.232 |
| NC\_009273\_rps19 | *rps19* | 0.3477 | 0.4 | 0.3763 | 0.2 | 51.797 | 0.4267 | 0.1333 | 0.5211 | 0.1695 | 0.126 | 0.225 |
| NC\_009273\_rps2 | *rps2* | 0.3755 | 0.4 | 0.4219 | 0.3 | 48.119 | 0.487 | 0.1347 | 0.4237 | 0.2013 | 0.172 | 0.252 |
| NC\_009273\_rps3 | *rps3* | 0.3242 | 0.5 | 0.3242 | 0.2 | 39.449 | 0.5 | 0.1582 | 0.5575 | 0.0629 | 0.177 | 0.162 |
| NC\_009273\_rps4 | *rps4* | 0.3828 | 0.5 | 0.3663 | 0.3 | 48.522 | 0.475 | 0.1625 | 0.4479 | 0.1533 | 0.151 | 0.247 |
| NC\_009273\_rps7 | *rps7* | 0.4081 | 0.5 | 0.4551 | 0.2 | 45.752 | 0.405 | 0.157 | 0.5231 | 0.1176 | 0.187 | 0.22 |
| NC\_009273\_rps7-2 | *rps7* | 0.4081 | 0.5 | 0.4551 | 0.2 | 45.752 | 0.405 | 0.157 | 0.5231 | 0.1176 | 0.187 | 0.22 |
| NC\_009273\_rps8 | *rps8* | 0.3556 | 0.4 | 0.3926 | 0.3 | 40.296 | 0.3636 | 0.2 | 0.5 | 0.1628 | 0.116 | 0.277 |
| NC\_009273\_ycf1 | *ycf1* | 0.3509 | 0.4 | 0.3168 | 0.3 | 45.145 | 0.4268 | 0.2154 | 0.4408 | 0.1862 | 0.154 | 0.308 |
| NC\_009273\_ycf1-2 | *ycf1* | 0.288 | 0.3 | 0.2865 | 0.2 | 56.84 | 0.5043 | 0.1605 | 0.5613 | 0.1207 | 0.175 | 0.2 |
| NC\_009273\_ycf2 | *ycf2* | 0.3737 | 0.4 | 0.3427 | 0.4 | 52.979 | 0.4472 | 0.2067 | 0.3964 | 0.2654 | 0.156 | 0.342 |
| NC\_009273\_ycf2-2 | *ycf2* | 0.3737 | 0.4 | 0.3427 | 0.4 | 52.979 | 0.4472 | 0.2067 | 0.3964 | 0.2654 | 0.156 | 0.342 |
| NC\_009273\_ycf3 | *ycf3* | 0.3905 | 0.5 | 0.3905 | 0.3 | 56.437 | 0.4848 | 0.1742 | 0.4492 | 0.1923 | 0.172 | 0.269 |
| NC\_009273\_ycf4 | *ycf4* | 0.3766 | 0.4 | 0.4162 | 0.3 | 46.347 | 0.5166 | 0.1391 | 0.3813 | 0.188 | 0.166 | 0.247 |
| NC\_047178\_accD | *accD* | 0.3422 | 0.4 | 0.3627 | 0.3 | 45.984 | 0.5887 | 0.1542 | 0.3584 | 0.1987 | 0.205 | 0.255 |
| NC\_047178\_atpA | *atpA* | 0.4035 | 0.5 | 0.3976 | 0.3 | 45.69 | 0.46 | 0.175 | 0.4302 | 0.1484 | 0.198 | 0.256 |
| NC\_047178\_atpB | *atpB* | 0.4258 | 0.6 | 0.3992 | 0.3 | 48.67 | 0.431 | 0.1872 | 0.4229 | 0.1725 | 0.207 | 0.289 |
| NC\_047178\_atpE | *atpE* | 0.3935 | 0.5 | 0.391 | 0.3 | 50.048 | 0.4667 | 0.1524 | 0.4299 | 0.172 | 0.173 | 0.252 |
| NC\_047178\_atpF | *atpF* | 0.3568 | 0.4 | 0.3243 | 0.3 | 44.416 | 0.4384 | 0.1849 | 0.4706 | 0.2033 | 0.16 | 0.289 |
| NC\_047178\_atpH | *atpH* | 0.4431 | 0.6 | 0.4878 | 0.2 | 43.802 | 0.5634 | 0.0423 | 0.3151 | 0.194 | 0.191 | 0.203 |
| NC\_047178\_atpI | *atpI* | 0.3773 | 0.5 | 0.36 | 0.3 | 47.368 | 0.4455 | 0.1991 | 0.4439 | 0.1053 | 0.168 | 0.249 |
| NC\_047178\_ccsA | *ccsA* | 0.2918 | 0.3 | 0.3435 | 0.2 | 40.496 | 0.5179 | 0.1143 | 0.5 | 0.1022 | 0.143 | 0.165 |
| NC\_047178\_cemA | *cemA* | 0.313 | 0.4 | 0.2826 | 0.3 | 45.924 | 0.5333 | 0.1833 | 0.4387 | 0.1654 | 0.201 | 0.248 |
| NC\_047178\_clpP | *clpP* | 0.4027 | 0.5 | 0.3807 | 0.3 | 50.912 | 0.4268 | 0.1911 | 0.4733 | 0.1298 | 0.157 | 0.254 |
| NC\_047178\_matK | *matK* | 0.3087 | 0.4 | 0.2979 | 0.3 | 49.844 | 0.5023 | 0.1307 | 0.4901 | 0.2038 | 0.144 | 0.235 |
| NC\_047178\_ndhA | *ndhA* | 0.3352 | 0.4 | 0.385 | 0.2 | 42.218 | 0.4712 | 0.1218 | 0.4861 | 0.095 | 0.129 | 0.175 |
| NC\_047178\_ndhB | *ndhB* | 0.3717 | 0.4 | 0.3899 | 0.3 | 46.046 | 0.4369 | 0.2056 | 0.4313 | 0.1205 | 0.159 | 0.267 |
| NC\_047178\_ndhB-2 | *ndhB* | 0.3717 | 0.4 | 0.3899 | 0.3 | 46.046 | 0.4369 | 0.2056 | 0.4313 | 0.1205 | 0.159 | 0.267 |
| NC\_047178\_ndhC | *ndhC* | 0.3609 | 0.5 | 0.3471 | 0.3 | 50.154 | 0.5248 | 0.0891 | 0.4045 | 0.1842 | 0.201 | 0.205 |
| NC\_047178\_ndhD | *ndhD* | 0.3359 | 0.4 | 0.36 | 0.3 | 47.771 | 0.4858 | 0.1554 | 0.4226 | 0.1297 | 0.141 | 0.226 |
| NC\_047178\_ndhE | *ndhE* | 0.3333 | 0.4 | 0.3235 | 0.3 | 54.17 | 0.5169 | 0.1573 | 0.3836 | 0.1475 | 0.143 | 0.237 |
| NC\_047178\_ndhF | *ndhF* | 0.303 | 0.4 | 0.3494 | 0.2 | 42.489 | 0.5412 | 0.1026 | 0.4683 | 0.1196 | 0.139 | 0.167 |
| NC\_047178\_ndhG | *ndhG* | 0.3427 | 0.4 | 0.3446 | 0.2 | 47.985 | 0.4907 | 0.1056 | 0.4167 | 0.1712 | 0.122 | 0.212 |
| NC\_047178\_ndhH | *ndhH* | 0.3706 | 0.5 | 0.3655 | 0.2 | 47.51 | 0.5115 | 0.1115 | 0.5017 | 0.127 | 0.157 | 0.18 |
| NC\_047178\_ndhI | *ndhI* | 0.3313 | 0.4 | 0.375 | 0.2 | 38.53 | 0.5652 | 0.1304 | 0.4867 | 0.0928 | 0.188 | 0.169 |
| NC\_047178\_ndhJ | *ndhJ* | 0.4046 | 0.5 | 0.3899 | 0.3 | 54.312 | 0.4882 | 0.1969 | 0.3839 | 0.19 | 0.165 | 0.295 |
| NC\_047178\_ndhK | *ndhK* | 0.3776 | 0.4 | 0.4513 | 0.2 | 47.739 | 0.5079 | 0.1152 | 0.4379 | 0.1548 | 0.162 | 0.212 |
| NC\_047178\_petA | *petA* | 0.3832 | 0.5 | 0.3551 | 0.3 | 52.668 | 0.502 | 0.1412 | 0.4111 | 0.2027 | 0.152 | 0.259 |
| NC\_047178\_petB | *petB* | 0.3873 | 0.5 | 0.412 | 0.3 | 41.664 | 0.55 | 0.1278 | 0.3789 | 0.1088 | 0.229 | 0.196 |
| NC\_047178\_petD | *petD* | 0.3789 | 0.5 | 0.3913 | 0.2 | 38.672 | 0.4638 | 0.1087 | 0.4758 | 0.1304 | 0.177 | 0.196 |
| NC\_047178\_petG | *petG* | 0.3421 | 0.4 | 0.3158 | 0.3 | 37.923 | 0.5152 | 0.1818 | 0.3571 | 0.125 | 0.199 | 0.25 |
| NC\_047178\_petL | *petL* | 0.3229 | 0.4 | 0.4375 | 0.2 | 46.5 | 0.4828 | 0.1379 | 0.4615 | 0 | 0.11 | 0.133 |
| NC\_047178\_petN | *petN* | 0.4333 | 0.5 | 0.4333 | 0.4 | 29.305 | 0.36 | 0.2 | 0.4545 | 0.0476 | 0.121 | 0.24 |
| NC\_047178\_psaA | *psaA* | 0.4163 | 0.5 | 0.4301 | 0.3 | 47.331 | 0.4743 | 0.17 | 0.4156 | 0.1449 | 0.194 | 0.253 |
| NC\_047178\_psaB | *psaB* | 0.405 | 0.5 | 0.4299 | 0.3 | 47.772 | 0.4888 | 0.1651 | 0.4023 | 0.1595 | 0.177 | 0.257 |
| NC\_047178\_psaC | *psaC* | 0.4146 | 0.5 | 0.5366 | 0.3 | 47.595 | 0.4697 | 0.1515 | 0.5179 | 0.1154 | 0.19 | 0.211 |
| NC\_047178\_psaI | *psaI* | 0.307 | 0.4 | 0.2895 | 0.3 | 41.901 | 0.5313 | 0.1563 | 0.3846 | 0.1364 | 0.19 | 0.229 |
| NC\_047178\_psaJ | *psaJ* | 0.3488 | 0.4 | 0.3953 | 0.2 | 29.68 | 0.3947 | 0.0789 | 0.5806 | 0.1379 | 0.127 | 0.175 |
| NC\_047178\_psbA | *psbA* | 0.4134 | 0.5 | 0.435 | 0.3 | 40.096 | 0.5724 | 0.2204 | 0.2857 | 0.0811 | 0.328 | 0.257 |
| NC\_047178\_psbB | *psbB* | 0.4316 | 0.6 | 0.4597 | 0.3 | 46.927 | 0.5173 | 0.1432 | 0.3827 | 0.1532 | 0.182 | 0.239 |
| NC\_047178\_psbC | *psbC* | 0.4318 | 0.5 | 0.4599 | 0.3 | 44.128 | 0.4642 | 0.1877 | 0.3938 | 0.1364 | 0.191 | 0.27 |
| NC\_047178\_psbD | *psbD* | 0.419 | 0.5 | 0.4322 | 0.3 | 44.45 | 0.5251 | 0.1873 | 0.3633 | 0.1255 | 0.254 | 0.257 |
| NC\_047178\_psbE | *psbE* | 0.4246 | 0.4 | 0.4762 | 0.4 | 48.566 | 0.4521 | 0.274 | 0.3333 | 0.1111 | 0.186 | 0.325 |
| NC\_047178\_psbF | *psbF* | 0.4167 | 0.5 | 0.45 | 0.4 | 61 | 0.3824 | 0.1471 | 0.4 | 0.2308 | 0.141 | 0.306 |
| NC\_047178\_psbH | *psbH* | 0.3919 | 0.4 | 0.4595 | 0.3 | 36.929 | 0.5246 | 0.0492 | 0.3559 | 0.2182 | 0.178 | 0.221 |
| NC\_047178\_psbI | *psbI* | 0.3333 | 0.5 | 0.2973 | 0.2 | 24.465 | 0.5313 | 0.1563 | 0.48 | 0.0435 | 0.188 | 0.171 |
| NC\_047178\_psbK | *psbK* | 0.3817 | 0.4 | 0.3387 | 0.4 | 42.887 | 0.4909 | 0.2545 | 0.2683 | 0.1622 | 0.131 | 0.345 |
| NC\_047178\_psbL | *psbL* | 0.2906 | 0.4 | 0.2564 | 0.3 | 39.015 | 0.5313 | 0.1875 | 0.4583 | 0.087 | 0.17 | 0.222 |
| NC\_047178\_psbM | *psbM* | 0.3143 | 0.5 | 0.2571 | 0.2 | 50.167 | 0.6333 | 0.1667 | 0.2692 | 0.0952 | 0.202 | 0.212 |
| NC\_047178\_psbN | *psbN* | 0.447 | 0.6 | 0.4091 | 0.4 | 37.165 | 0.3611 | 0.25 | 0.4545 | 0.1613 | 0.136 | 0.333 |
| NC\_047178\_psbT | *psbT* | 0.2941 | 0.3 | 0.3529 | 0.2 | 47.385 | 0.4815 | 0.1111 | 0.5 | 0.1364 | 0.19 | 0.188 |
| NC\_047178\_psbZ | *psbZ* | 0.3492 | 0.4 | 0.4127 | 0.3 | 57.443 | 0.5439 | 0.1404 | 0.28 | 0.1429 | 0.229 | 0.237 |
| NC\_047178\_rbcL | *rbcL* | 0.4403 | 0.6 | 0.4375 | 0.3 | 48.532 | 0.4898 | 0.1939 | 0.3928 | 0.1602 | 0.264 | 0.281 |
| NC\_047178\_rpl14 | *rpl14* | 0.3875 | 0.5 | 0.3902 | 0.2 | 46.004 | 0.4078 | 0.1553 | 0.5102 | 0.1446 | 0.151 | 0.233 |
| NC\_047178\_rpl16 | *rpl16* | 0.4142 | 0.5 | 0.5147 | 0.2 | 39.931 | 0.4286 | 0.1048 | 0.5351 | 0.099 | 0.148 | 0.165 |
| NC\_047178\_rpl2 | *rpl2* | 0.4339 | 0.5 | 0.4836 | 0.3 | 54.4 | 0.3922 | 0.1853 | 0.448 | 0.1759 | 0.133 | 0.291 |
| NC\_047178\_rpl2-2 | *rpl2* | 0.4339 | 0.5 | 0.4836 | 0.3 | 54.4 | 0.3922 | 0.1853 | 0.448 | 0.1759 | 0.133 | 0.291 |
| NC\_047178\_rpl20 | *rpl20* | 0.3701 | 0.4 | 0.4322 | 0.3 | 51.935 | 0.42 | 0.12 | 0.4778 | 0.2152 | 0.091 | 0.254 |
| NC\_047178\_rpl22 | *rpl22* | 0.3395 | 0.4 | 0.3851 | 0.2 | 48.762 | 0.4597 | 0.1774 | 0.5508 | 0.1028 | 0.165 | 0.213 |
| NC\_047178\_rpl23 | *rpl23* | 0.3688 | 0.4 | 0.383 | 0.3 | 53.869 | 0.4521 | 0.1507 | 0.4571 | 0.1774 | 0.127 | 0.253 |
| NC\_047178\_rpl23-2 | *rpl23* | 0.3688 | 0.4 | 0.383 | 0.3 | 53.869 | 0.4521 | 0.1507 | 0.4571 | 0.1774 | 0.127 | 0.253 |
| NC\_047178\_rpl32 | *rpl32* | 0.3208 | 0.3 | 0.434 | 0.3 | 41.858 | 0.5278 | 0.1111 | 0.4524 | 0.1795 | 0.243 | 0.224 |
| NC\_047178\_rpl33 | *rpl33* | 0.3582 | 0.4 | 0.3881 | 0.3 | 40.649 | 0.4902 | 0.1961 | 0.4082 | 0.2381 | 0.187 | 0.308 |
| NC\_047178\_rpl36 | *rpl36* | 0.3947 | 0.4 | 0.4737 | 0.3 | 21.459 | 0.3793 | 0.1379 | 0.4516 | 0.28 | 0.103 | 0.306 |
| NC\_047178\_rpoA | *rpoA* | 0.3333 | 0.5 | 0.2988 | 0.2 | 47.828 | 0.4729 | 0.1589 | 0.5187 | 0.1505 | 0.148 | 0.226 |
| NC\_047178\_rpoB | *rpoB* | 0.3871 | 0.5 | 0.3765 | 0.3 | 49.282 | 0.4624 | 0.1315 | 0.4468 | 0.2182 | 0.15 | 0.262 |
| NC\_047178\_rpoC1 | *rpoC1* | 0.3764 | 0.5 | 0.3759 | 0.3 | 47.792 | 0.4834 | 0.1439 | 0.4737 | 0.1678 | 0.153 | 0.234 |
| NC\_047178\_rpoC2 | *rpoC2* | 0.3676 | 0.5 | 0.3681 | 0.3 | 49.395 | 0.4562 | 0.1653 | 0.4511 | 0.1916 | 0.15 | 0.267 |
| NC\_047178\_rps11 | *rps11* | 0.4341 | 0.5 | 0.5683 | 0.2 | 42.618 | 0.4262 | 0.123 | 0.5086 | 0.0755 | 0.136 | 0.172 |
| NC\_047178\_rps12 | *rps12* | 0.4355 | 0.5 | 0.4758 | 0.3 | 48.167 | 0.3689 | 0.1942 | 0.4571 | 0.1649 | 0.131 | 0.295 |
| NC\_047178\_rps12-2 | *rps12* | 0.4355 | 0.5 | 0.4758 | 0.3 | 48.167 | 0.3689 | 0.1942 | 0.4571 | 0.1649 | 0.131 | 0.295 |
| NC\_047178\_rps14 | *rps14* | 0.4125 | 0.4 | 0.4752 | 0.3 | 45.923 | 0.3733 | 0.12 | 0.4512 | 0.2895 | 0.135 | 0.323 |
| NC\_047178\_rps15 | *rps15* | 0.3071 | 0.4 | 0.3034 | 0.2 | 42.765 | 0.4531 | 0.0625 | 0.5634 | 0.2154 | 0.148 | 0.207 |
| NC\_047178\_rps16 | *rps16* | 0.3483 | 0.5 | 0.382 | 0.2 | 45.424 | 0.5417 | 0.0833 | 0.4783 | 0.1406 | 0.139 | 0.172 |
| NC\_047178\_rps18 | *rps18* | 0.3366 | 0.3 | 0.4314 | 0.2 | 36.373 | 0.5063 | 0.1013 | 0.4302 | 0.1818 | 0.111 | 0.222 |
| NC\_047178\_rps19 | *rps19* | 0.3477 | 0.4 | 0.3763 | 0.2 | 51.797 | 0.4267 | 0.1333 | 0.5211 | 0.1695 | 0.126 | 0.225 |
| NC\_047178\_rps2 | *rps2* | 0.3797 | 0.4 | 0.4219 | 0.3 | 48.287 | 0.4767 | 0.1451 | 0.4237 | 0.2013 | 0.171 | 0.261 |
| NC\_047178\_rps3 | *rps3* | 0.3242 | 0.5 | 0.3242 | 0.2 | 39.449 | 0.5 | 0.1582 | 0.5575 | 0.0629 | 0.177 | 0.162 |
| NC\_047178\_rps4 | *rps4* | 0.3828 | 0.5 | 0.3663 | 0.3 | 48.522 | 0.475 | 0.1625 | 0.4479 | 0.1533 | 0.151 | 0.247 |
| NC\_047178\_rps7 | *rps7* | 0.4081 | 0.5 | 0.4551 | 0.2 | 45.752 | 0.405 | 0.157 | 0.5231 | 0.1176 | 0.187 | 0.22 |
| NC\_047178\_rps7-2 | *rps7* | 0.4081 | 0.5 | 0.4551 | 0.2 | 45.752 | 0.405 | 0.157 | 0.5231 | 0.1176 | 0.187 | 0.22 |
| NC\_047178\_rps8 | *rps8* | 0.3506 | 0.4 | 0.3926 | 0.3 | 37.831 | 0.3636 | 0.1909 | 0.5185 | 0.1512 | 0.11 | 0.262 |
| NC\_047178\_ycf1 | *ycf1* | 0.2872 | 0.3 | 0.2811 | 0.2 | 45.639 | 0.505 | 0.1629 | 0.565 | 0.1227 | 0.182 | 0.202 |
| NC\_047178\_ycf2 | *ycf2* | 0.3735 | 0.4 | 0.3432 | 0.4 | 52.86 | 0.4471 | 0.2061 | 0.3967 | 0.2654 | 0.156 | 0.341 |
| NC\_047178\_ycf2-2 | *ycf2* | 0.3735 | 0.4 | 0.3432 | 0.4 | 52.86 | 0.4471 | 0.2061 | 0.3967 | 0.2654 | 0.156 | 0.341 |
| NC\_047178\_ycf3 | *ycf3* | 0.3905 | 0.5 | 0.3905 | 0.3 | 56.437 | 0.4848 | 0.1742 | 0.4492 | 0.1923 | 0.172 | 0.269 |
| NC\_047178\_ycf4 | *ycf4* | 0.3802 | 0.4 | 0.4162 | 0.3 | 46.509 | 0.5166 | 0.1457 | 0.3669 | 0.1966 | 0.171 | 0.259 |

GC: the total GC content; GC1:the GC content at first codon position; GC2: the GC content at second codon position; GC3: the GC content at third codon position; ENC: the effective number of codons; T3s: the thymine content at synonymous third codon position; C3s: the cytosine content at synonymous third codon position; A3s: the adenine content at synonymous third codon position; G3s: the guanine content at synonymous third codon position; CAI: the codon adaptation index; GC3s: the GC content at synonymous third codon position.

**Table S10.** List of chloroplast genomes used for phylogenetic analysis in this study.

|  |  |
| --- | --- |
| Species | GenBank ID |
| *Cardamine pentaphyllos* | NC\_049617.1 |
| *Nasturtium officinale* | MK045962.1 |
| *Rorippa islandica* | MK637784.1 |
| *Dipoma iberideum* | NC\_049626.1 |
| *Crucihimalaya lasiocarpa* | NC\_049612.1 |
| *Erysimum cheiranthoides* | MN207123.1 |
| *Olimarabidopsis pumila* | AP009368.1 |
| *Turritis glabra* | MK637811.1 |
| *Capsella bursa-pastoris* | MT040199.1 |
| *Camelina sativa* | LN877386.1 |
| *Stevenia cheiranthoides* | MK637795.1 |
| *Lepidium meyenii* | MT430983.1 |
| *Lepidium virginicum* | NC\_009273.1 |
| *Lepidium sativum* | NC\_047178.1 |
| *Lepidium apetalum* | MT880914 |
| *Lepidium perfoliatum* | MT880913 |
| *Yinshania furcatopilosa* | MK637818.1 |
| *Smelowskia calycina* | MK637794.1 |
| *Raphanus sativus* | KJ716483.1 |
| *Leiospora exscapa* | NC\_049661.1 |
| *Dontostemon micranthus* | NC\_049628.1 |



**Fig. S1.** Statistics of the SNPs in the five cp genomes.

Macintosh HD:Users:shuuakane:Desktop:2017:文章:SCI:独行菜属相关基因的序列:所有的图片:R5.pdf

**Fig. S2.** Analysis of relative usage of synonymous codons of CDS in five *Lepidium* species. The numbers in the figure indicate the relative synonymous codon usage (RSCU); Underlined value indicate that five *Lepidium* species gene uses this codon higher.