Table S1 The results of genetic prediction of 138A and 138B

| Gene ID in 138A | mRNA start (bp) | mRNA end (bp) | Gene ID in 138B | mRNA start (bp) | mRNA end (bp) |
|---|---|---|---|---|---|
| *atp1* | 366454 | 367983 | *atp1* | 139478 | 141007 |
| *atp6a* | 18311 | 19165 | *atp6* | 216911 | 218206 |
| *atp9* | 361077 | 361310 | *atp9* | 134083 | 134316 |
| *ccmB* | 419104 | 419724 | *ccmB* | 337541 | 338161 |
| *ccmC* | 127246 | 127998 | *ccmC* | 65687 | 66439 |
| *ccmFc* | 449048 | 451309 | *ccmFc* | 320141 | 322402 |
| *ccmFN* | 216352 | 218121 | *ccmFN* | 167657 | 169426 |
| *cob* | 208057 | 209238 | *cob* | 159362 | 160543 |
| *cox1* | 120831 | 122414 | *cox1* | 71271 | 72854 |
| *cox2* | 248099 | 249780 | *cox2* | 498662 | 500343 |
| *cox3* | 309798 | 310595 | *cox3* | 269485 | 270282 |
| *mat-R* | 282583 | 284559 | *mat-R* | 99831 | 101807 |
| *nad1* | 9114 | 427026 | *nad1* | 25613 | 298076 |
| *nad2* | 299505 | 386510 | *nad2* | 116758 | 375645 |
| *nad3* | 332402 | 332758 | *nad3* | 292136 | 292492 |
| *nad4* | 103291 | 111977 | *nad4* | 81702 | 90388 |
| *nad4L* | 163495 | 163797 | *nad4L* | 29827 | 30129 |
| *nad5* | 154710 | 395190 | *nad5* | 38923 | 364386 |
| *nad6* | 93296 | 93952 | *nad6* | 412957 | 413613 |
| *nad7* | 481079 | 486370 | *nad7* | 1875 | 7142 |
| *nad9* | 409327 | 409899 | *nad9* | 347376 | 347948 |
| *orf100a* | 305194 | 305496 | *orf100c-1* | 98113 | 98415 |
| *orf100b* | 274128 | 274430 | *orf100c-2* | 411343 | 411645 |
| *orf100c* | 95264 | 95566 | *orf100d* | 426225 | 426527 |
| *orf100d* | 80401 | 80703 | *orf101a* | 362046 | 362351 |
| *orf101a* | 394936 | 395241 | *orf101b* | 232387 | 232692 |
| *orf101b* | 3825 | 4130 | *orf102a* | 501452 | 501760 |
| *orf102a* | 250889 | 251197 | *orf102b* | 361110 | 361418 |
| *orf102b* | 395869 | 396177 | *orf102c* | 328647 | 328955 |
| *orf102c* | 457545 | 457853 | *orf102d* | 427455 | 427763 |
| *orf102d* | 79165 | 79473 | *orf102e* | 230208 | 230516 |
| *orf102e* | 6001 | 6309 | *orf102f* | 496078 | 496386 |
| *orf102f* | 245515 | 245823 | *orf102g* | 173340 | 173648 |
| *orf102g* | 222035 | 222343 | *orf102h* | 53183 | 53491 |
| *orf102h* | 140163 | 140471 | *orf102i* | 59215 | 59523 |
| *orf102i* | 134152 | 134460 | *orf102j* | 68932 | 69240 |
| *orf102j* | 124445 | 124753 | *orf102k* | 428596 | 428904 |
| *orf102k* | 78024 | 78332 | *orf102l* | 470324 | 470632 |
| *orf102l* | 36428 | 36736 | *orf102m* | 366458 | 366766 |
| *orf103a* | 312999 | 313310 | *orf103a* | 272695 | 273006 |
| *orf103b* | 394684 | 394995 | *orf103b* | 362292 | 362603 |
| *orf103c* | 417061 | 417372 | *orf103c* | 339893 | 340204 |

| | | | | | |
|---|---|---|---|---|---|
| *orf103d* | 397354 | 397665 | *orf103d* | 359622 | 359933 |
| *orf103e* | 187223 | 187534 | *orf103e* | 402916 | 403227 |
| *orf104a* | 325861 | 326175 | *orf103f-1* | 210133 | 210444 |
| *orf104b* | 453552 | 453866 | *orf103f-2* | 260647 | 260958 |
| *orf104c* | 332923 | 333237 | *orf104a* | 285595 | 285909 |
| *orf104d* | 110225 | 110539 | *orf104b* | 324645 | 324959 |
| *orf105a* | 218067 | 218384 | *orf104d* | 83140 | 83454 |
| *orf105b* | 290111 | 290428 | *orf104e* | 191898 | 192212 |
| *orf106a* | 321777 | 322097 | *orf105a* | 169372 | 169689 |
| *orf106b* | 330547 | 330867 | *orf105b* | 107364 | 107681 |
| *orf106c* | 409945 | 410265 | *orf106a* | 281446 | 281766 |
| *orf106d-1* | 174058 | 174378 | *orf106b* | 290281 | 290601 |
| *orf106d-2* | 468275 | 468595 | *orf106c* | 347010 | 347330 |
| *orf107a* | 28558 | 28881 | *orf106d-1* | 198553 | 198873 |
| *orf107b* | 290648 | 290971 | *orf106d-2* | 249067 | 249387 |
| *orf107c* | 73915 | 74238 | *orf107a* | 478178 | 478501 |
| *orf107d* | 124563 | 124886 | *orf107b* | 107901 | 108224 |
| *orf108a* | 57463 | 57789 | *orf107d* | 68799 | 69122 |
| *orf108b-1* | 183430 | 183756 | *orf108a* | 449168 | 449494 |
| *orf108b-2* | 477647 | 477973 | *orf108b* | 511271 | 511597 |
| *orf108c* | 395417 | 395743 | *orf108c* | 361544 | 361870 |
| *orf108d* | 372473 | 372799 | *orf108d-1* | 145506 | 145832 |
| *orf108e* | 90056 | 90382 | *orf108d-2* | 391088 | 391414 |
| *orf108f* | 143079 | 143405 | *orf108e* | 416527 | 416853 |
| *orf108g* | 23578 | 23904 | *orf108f* | 50249 | 50575 |
| *orf108h* | 12738 | 13064 | *orf108h* | 223453 | 223779 |
| *orf109a* | 309132 | 309461 | *orf109a* | 268819 | 269148 |
| *orf109b* | 31888 | 32217 | *orf109b* | 474843 | 475172 |
| *orf109c* | 491447 | 491776 | *orf109c* | 12219 | 12548 |
| *orf110a* | 33111 | 33443 | *orf110a* | 473617 | 473949 |
| *orf110b* | 212143 | 212475 | *orf110b* | 163448 | 163780 |
| *orf110c* | 202103 | 202435 | *orf110c* | 153396 | 153728 |
| *orf111a* | 311885 | 312220 | *orf110d* | 483155 | 483487 |
| *orf111b* | 14408 | 14743 | *orf111a* | 271581 | 271916 |
| *orf112a* | 100356 | 100694 | *orf111b* | 221774 | 222109 |
| *orf113a* | 62908 | 63249 | *orf112a-1* | 92985 | 93323 |
| *orf114a* | 62487 | 62831 | *orf112a-2* | 406215 | 406553 |
| *orf114b* | 336995 | 337339 | *orf113a* | 443708 | 444049 |
| *orf115a* | 448241 | 448588 | *orf114a* | 444126 | 444470 |
| *orf115b* | 421643 | 421990 | *orf114b-1* | 201328 | 201672 |
| *orf115c* | 110223 | 110570 | *orf114b-2* | 251842 | 252186 |
| *orf117a-1* | 116220 | 116573 | *orf115a* | 319334 | 319681 |
| *orf117a-2* | 272073 | 272426 | *orf115c* | 83109 | 83456 |
| *orf117b* | 431927 | 432280 | *orf115d* | 241791 | 242138 |

| | | | | | |
|---|---|---|---|---|---|
| *orf117c* | 93633 | 93986 | *orf116a* | 73745 | 74095 |
| *orf118a* | 308547 | 308903 | *orf117a* | 77106 | 77459 |
| *orf119a* | 302441 | 302800 | *orf117b* | 302987 | 303340 |
| *orf119b* | 310189 | 310548 | *orf117c* | 412923 | 413276 |
| *orf119c* | 306816 | 307175 | *orf118a* | 268234 | 268590 |
| *orf121a* | 346558 | 346923 | *orf119b* | 269876 | 270235 |
| *orf122a* | 285780 | 286148 | *orf119c* | 266503 | 266862 |
| *orf123a* | 64629 | 65000 | *orf121a* | 119554 | 119919 |
| *orf123b* | 69409 | 69780 | *orf121b* | 53503 | 53868 |
| *orf124a* | 78654 | 79028 | *orf122a* | 103028 | 103396 |
| *orf124b* | 114382 | 114756 | *orf123a* | 441947 | 442318 |
| *orf125a* | 368798 | 369175 | *orf123b* | 437156 | 437527 |
| *orf125b-1* | 176259 | 176636 | *orf124a* | 427900 | 428274 |
| *orf125b-2* | 470476 | 470853 | *orf124b* | 78923 | 79297 |
| *orf125c* | 482354 | 482731 | *orf125a-1* | 141822 | 142199 |
| *orf125d* | 425958 | 426335 | *orf125a-2* | 387404 | 387781 |
| *orf125e* | 128376 | 128753 | *orf125b* | 504090 | 504467 |
| *orf125f* | 116008 | 116385 | *orf125c* | 3150 | 3527 |
| *orf126a* | 501985 | 502365 | *orf125d* | 297008 | 297385 |
| *orf126b* | 371594 | 371974 | *orf125e* | 64932 | 65309 |
| *orf127a* | 186153 | 186536 | *orf125f* | 77294 | 77671 |
| *orf128a* | 203320 | 203706 | *orf128a* | 154613 | 154999 |
| *orf128b* | 420221 | 420607 | *orf128b* | 336658 | 337044 |
| *orf128c* | 485984 | 486370 | *orf128c* | 6756 | 7142 |
| *orf129a* | 9109 | 9498 | *orf129a* | 227019 | 227408 |
| *orf131a* | 297998 | 298393 | *orf129b-1* | 144618 | 145007 |
| *orf131b* | 420262 | 420657 | *orf129b-2* | 390200 | 390589 |
| *orf131c* | 104430 | 104825 | *orf130a* | 403914 | 404306 |
| *orf134b* | 254710 | 255108 | *orf131a* | 115251 | 115646 |
| *orf132b* | 502655 | 503053 | *orf131b* | 336608 | 337003 |
| *orf132c* | 63926 | 64324 | *orf131c* | 88854 | 89249 |
| *orf133a* | 352223 | 352624 | *orf132b* | 237692 | 238090 |
| *orf133b* | 395760 | 396161 | *orf132c* | 442623 | 443021 |
| *orf133c* | 10212 | 10613 | *orf133a* | 125219 | 125620 |
| *orf134a-1* | 173716 | 174120 | *orf133b* | 361126 | 361527 |
| *orf134a-2* | 467933 | 468337 | *orf133c* | 225904 | 226305 |
| *orf134b* | 300670 | 301074 | *orf134a-1* | 198211 | 198615 |
| *orf134c* | 108846 | 109250 | *orf134a-2* | 248725 | 249129 |
| *orf135a* | 248099 | 248506 | *orf134b* | 117923 | 118327 |
| *orf137a* | 166115 | 166528 | *orf134c* | 84429 | 84833 |
| *orf138a* | 95973 | 96389 | *orf135a* | 498662 | 499069 |
| *orf140a* | 421216 | 421638 | *orf137a* | 27096 | 27509 |
| *orf141a* | 280940 | 281365 | *orf138a-1* | 97290 | 97706 |
| *orf142a* | 416055 | 416483 | *orf138a-2* | 410520 | 410936 |

| | | | | | |
|---|---|---|---|---|---|
| *orf144a* | 89366 | 89800 | *orf142a* | 340790 | 341218 |
| *orf145a* | 363072 | 363509 | *orf144a* | 417109 | 417543 |
| *orf146a* | 389323 | 389763 | *orf145a* | 136078 | 136515 |
| *orf147a* | 48262 | 48705 | *orf146a* | 367544 | 367984 |
| *orf147b* | 154914 | 155357 | *orf147a* | 458346 | 458789 |
| *orf149a-1* | 471244 | 471693 | *orf147b* | 38297 | 38740 |
| *orf149a-2* | 177027 | 177476 | *orf150a* | 292136 | 292588 |
| *orf150a* | 332402 | 332854 | *orf152b* | 444737 | 445195 |
| *orf152a* | 324225 | 324683 | *orf152c-1* | 96105 | 96563 |
| *orf152b* | 61762 | 62220 | *orf152c-2* | 409335 | 409793 |
| *orf152c* | 97116 | 97574 | *orf152d* | 40664 | 41122 |
| *orf152d* | 152532 | 152990 | *orf154a* | 172062 | 172526 |
| *orf154a* | 220757 | 221221 | *orf158a* | 108348 | 108824 |
| *orf157a* | 119467 | 119940 | *orf161a* | 38370 | 38855 |
| *orf158a* | 291095 | 291571 | *orf162a* | 508356 | 508844 |
| *orf161a* | 154799 | 155284 | *orf163a* | 426873 | 427364 |
| *orf162a-1* | 180515 | 181003 | *orf164a* | 307622 | 308116 |
| *orf162a-2* | 474732 | 475220 | *orf166a* | 2217 | 2717 |
| *orf163a* | 79564 | 80055 | *orf166b* | 385421 | 385921 |
| *orf164a* | 436562 | 437056 | *orf168a* | 500566 | 501072 |
| *orf165a* | 271323 | 271820 | *orf169a* | 314726 | 315235 |
| *orf166a* | 481421 | 481921 | *orf171a* | 497898 | 498413 |
| *orf168a* | 250003 | 250509 | *orf171b* | 87913 | 88428 |
| *orf169a* | 443642 | 444151 | *orf172a* | 66844 | 67362 |
| *orf171a* | 247335 | 247850 | *orf178a* | 427851 | 428387 |
| *orf171b* | 105251 | 105766 | *orf185a* | 89861 | 90418 |
| *orf178a* | 78541 | 79077 | *orf185b* | 220934 | 221491 |
| *orf184a* | 126323 | 126877 | *orf187a* | 220004 | 220567 |
| *orf185a* | 103261 | 103818 | *orf188a* | 436062 | 436628 |
| *orf185b* | 15026 | 15583 | *orf188b* | 162199 | 162765 |
| *orf187a* | 15950 | 16513 | *orf190a* | 80740 | 81312 |
| *orf188a* | 70308 | 70874 | *orf204a* | 111039 | 111653 |
| *orf190a* | 112367 | 112939 | *orf204b* | 488433 | 489047 |
| *orf204a* | 293786 | 294400 | *orf208a* | 321776 | 322402 |
| *orf204b* | 237881 | 238495 | *orf214a* | 373419 | 374063 |
| *orf208a* | 450683 | 451309 | *orf224a* | 151963 | 152637 |
| *orf214a* | 383255 | 383899 | *orf226a* | 504637 | 505317 |
| *orf224a* | 200670 | 201344 | *orf229a* | 475403 | 476092 |
| *orf229a* | 30968 | 31657 | *orf237a* | 4448 | 5161 |
| *orf237a* | 483664 | 484377 | *orf240a* | 77818 | 78540 |
| *orf240a* | 115139 | 115861 | *orf242a* | 279403 | 280131 |
| *orf242a* | 319734 | 320462 | *orf249a* | 23773 | 24522 |
| *orf244a* | 273300 | 274034 | *orf261a* | 335264 | 336049 |
| *orf249a* | 169102 | 169851 | *orf264a-1* | 141062 | 141856 |

| | | | | | |
|---|---|---|---|---|---|
| *orf262a* | 271069 | 271857 | *orf264a-2* | 386644 | 387438 |
| *orf264a* | 368038 | 368832 | *orf267a* | 21030 | 21833 |
| *orf267a* | 500246 | 501049 | *orf279a* | 411761 | 412600 |
| *orf279a* | 94309 | 95148 | *orf293a-1* | 90486 | 91367 |
| *orf292a* | 185862 | 186740 | *orf293a-2* | 875 | 1756 |
| *orf293a-1* | 102312 | 103193 | *orf294a* | 320141 | 321025 |
| *orf293a-2* | 480079 | 480960 | *orf295a* | 403710 | 404597 |
| *orf294a* | 449048 | 449932 | *orf301a* | 127413 | 128318 |
| *orf300a* | 302143 | 303045 | *orf337a* | 44076 | 45089 |
| *orf301a* | 354417 | 355322 | *orf353a* | 239901 | 240962 |
| *orf314a* | 262814 | 263758 | *orf399a* | 363193 | 364392 |
| *orf337a* | 148565 | 149578 | *orf427a* | 277140 | 278423 |
| *orf338a* | 272261 | 273277 | *orf470a* | 385177 | 386589 |
| *orf399a* | 392895 | 394094 | *orf473a* | 238532 | 239953 |
| *orf430a* | 317434 | 318726 | *orf481a-1* | 208221 | 209666 |
| *orf484a* | 51001 | 52455 | *orf481a-2* | 258735 | 260180 |
| *orf498a* | 48702 | 50198 | *orf484a* | 454596 | 456050 |
| *orf515a* | 53230 | 54777 | *orf498a* | 456853 | 458349 |
| *orf543a* | 144640 | 146271 | *orf543a* | 47383 | 49014 |
| *orf545a* | 295666 | 297303 | *orf545a* | 112919 | 114556 |
| *orf559a* | 245765 | 247444 | *orf551a* | 452180 | 453835 |
| *orf603a* | 216352 | 218163 | *orf559a* | 496328 | 498007 |
| *orf675a* | 149724 | 151751 | *orf603a* | 167657 | 169468 |
| *orf750a* | 198392 | 200644 | *orf675a* | 41903 | 43930 |
| *orfB* | 311237 | 311698 | *orf750a* | 149685 | 151937 |
| *orfX* | 420262 | 421113 | *orfB* | 270924 | 271394 |
| *rpl10* | 189100 | 189579 | *orfX* | 336152 | 337003 |
| *rpl16* | 247374 | 247850 | *rpl10* | 400909 | 401388 |
| *rpl2* | 185862 | 188811 | *rpl16* | 497937 | 498413 |
| *rpl5* | 210894 | 211448 | *rpl2* | 401677 | 404597 |
| *rps10* | 11900 | 13007 | *rpl5* | 162199 | 162753 |
| *rps12* | 331976 | 332353 | *rps10* | 223510 | 224617 |
| *rps13* | 168542 | 168892 | *rps12* | 291710 | 292087 |
| *rps19* | 244385 | 244669 | *rps13* | 24732 | 25082 |
| *rps3* | 244683 | 247444 | *rps19* | 494948 | 495232 |
| *rps4* | 153253 | 154290 | *rps3* | 495246 | 498007 |
| *sdh3* | 301640 | 301972 | *rps4* | 39364 | 40401 |
| *sdh4* | 309493 | 309870 | *sdh3* | 118893 | 119225 |
| *orf25* | 162719 | 163306 | *sdh4* | 269180 | 269557 |
| | | | *orf25* | 30318 | 30914 |

Table S2 The specific ORFs in 138A and their transmembrane domain number

| Gene ID | mRNA start (bp) | mRNA end (bp) | No. of transmembrane domain |
|---|---|---|---|
| *orf108g* | 23578 | 23904 | 0 |
| *orf515a* | 53230 | 54777 | 0 |
| *orf107c* | 73915 | 74238 | 0 |
| *orf157a* | 119467 | 119940 | 2 |
| *orf184a* | 126323 | 126877 | 0 |
| *orf149a-2* | 177027 | 177476 | 0 |
| *orf292a* | 185862 | 186740 | 0 |
| *orf127a* | 186153 | 186536 | 0 |
| *orf132a* | 254710 | 255108 | 0 |
| *orf314a* | 262814 | 263758 | 2 |
| *orf262a* | 271069 | 271857 | 1 |
| *orf165a* | 271323 | 271820 | 0 |
| *orf338a* | 272261 | 273277 | 0 |
| *orf244a* | 273300 | 274034 | 0 |
| *orf100b* | 274128 | 274430 | 0 |
| *orf141a* | 280940 | 281365 | 0 |
| *orf300a* | 302143 | 303045 | 3 |
| *orf119a* | 302441 | 302800 | 0 |
| *orf100a* | 305194 | 305496 | 0 |
| *orf430a* | 317434 | 318726 | 0 |
| *orf152a* | 324225 | 324683 | 0 |
| *orf104c* | 332923 | 333237 | 0 |
| *orf126b* | 371594 | 371974 | 0 |
| *orf140a* | 421216 | 421638 | 0 |
| *orf115b* | 421643 | 421990 | 2 |
| *orf149a-1* | 471244 | 471693 | 0 |
| *orf126a* | 501985 | 502365 | 0 |

Table S3 The location information of 138A unique regions and the ORFs in it

| No. | start (bp) | end (bp) | size (bp) | orf name | orf start (bp) | orf end (bp) |
|---|---|---|---|---|---|---|
| 1 | 19114 | 23689 | 4576 | *orf108g* | 23578 | 23904 |
| 2 | 174859 | 175164 | 306 | *NA* | | |
| 3 | 251956 | 257728 | 5773 | *orf132a* | 254710 | 255108 |
| 4 | 263745 | 269224 | 5480 | *orf314a* | 262814 | 263758 |
| 5 | 270983 | 280625 | 9643 | *orf262a* | 271069 | 271857 |
| | | | | *orf165a* | 271323 | 271820 |
| | | | | *orf338a* | 272261 | 273277 |
| | | | | *orf244a* | 273300 | 274034 |
| | | | | *orf100b* | 274128 | 274430 |
| 6 | 302060 | 305384 | 3325 | *orf300a* | 302143 | 303045 |
| | | | | *orf119a* | 302441 | 302800 |
| | | | | *orf100a* | 305194 | 305496 |
| 7 | 333326 | 334920 | 1595 | *NA* | | |
| 8 | 346229 | 346265 | 37 | *NA* | | |
| 9 | 464064 | 464268 | 205 | *NA* | | |
| 10 | 469076 | 469381 | 306 | *NA* | | |
| 11 | 501404 | 501422 | 19 | *NA* | | |

Table S4 The specific ORFs in 138B and their transmembrane domain number

| Gene ID | mRNA start (bp) | mRNA end (bp) | No. of transmembrane domain |
|---|---|---|---|
| *orf121b* | 53503 | 53868 | 0 |
| *orf172a* | 66844 | 67362 | 0 |
| *orf116a* | 73745 | 74095 | 2 |
| *orf129b-1* | 144618 | 145007 | 0 |
| *orf188b* | 162199 | 162765 | 0 |
| *orf104e* | 191898 | 192212 | 0 |
| *orf481a-1* | 208221 | 209666 | 0 |
| *orf103f-1* | 210133 | 210444 | 0 |
| *orf431a* | 216911 | 218206 | 5 |
| *orf473a* | 238532 | 239953 | 6 |
| *orf353a* | 239901 | 240962 | 6 |
| *orf115d* | 241791 | 242138 | 0 |
| *orf481a-2* | 258735 | 260180 | 0 |
| *orf103f-2* | 260647 | 260958 | 0 |
| *orf427a* | 277140 | 278423 | 0 |
| *orf261a* | 335264 | 336049 | 2 |
| *orf102m* | 366458 | 366766 | 0 |
| *orf470a* | 385177 | 386589 | 1 |
| *orf166b* | 385421 | 385921 | 0 |
| *orf129b-2* | 390200 | 390589 | 0 |
| *orf295a* | 403710 | 404597 | 0 |
| *orf130a* | 403914 | 404306 | 0 |
| *orf551a* | 452180 | 453835 | 0 |
| *orf110d* | 483155 | 483487 | 0 |
| *orf226a* | 504637 | 505317 | 0 |
| *orf108b* | 511271 | 511597 | 0 |

Table S5 The location information of 138B unique regions and the ORFs in it

| No. | start (bp) | end (bp) | size (bp) | orf name | orf start (bp) | orf end (bp) |
|---|---|---|---|---|---|---|
| 1 | 23622 | 23738 | 117 | *NA* | | |
| 2 | 98479 | 98523 | 45 | *NA* | | |
| 3 | 184124 | 194592 | 10469 | *orf104e* | 191898 | 192212 |
| 4 | 207737 | 211824 | 4088 | *orf481a-1* | 208221 | 209666 |
| | | | | *orf103f-1* | 210133 | 210444 |
| 5 | 238448 | 241795 | 3348 | *orf473a* | 238532 | 239953 |
| | | | | *orf353a* | 239901 | 240962 |
| | | | | *orf115d* | 241791 | 242138 |
| 6 | 242701 | 245060 | 2360 | *NA* | | |
| 7 | 258251 | 262181 | 3931 | *orf481a-2* | 258735 | 260180 |
| | | | | *orf103f-2* | 260647 | 260958 |
| 8 | 293060 | 293089 | 30 | *NA* | | |
| 9 | 382300 | 384754 | 2455 | *orf470a* | 385177 | 386589 |
| 10 | 384968 | 386081 | 1114 | *orf166b* | 385421 | 385921 |
| 11 | 453092 | 453146 | 55 | *orf551a* | 452180 | 453835 |
| 12 | 502519 | 502995 | 477 | *NA* | | |

Table S6 The results of SNP annotation with 138A as the reference sequence

| Sample ID | CDS | | | | | Intergenic | Total |
|---|---|---|---|---|---|---|---|
| | Start- nonsyn | Stop- nonsyn | Premature- stop | Synonymous | Nonsynonymous | | |
| 138B | 3 | 0 | 3 | 13 | 40 | 53 | 112 |
| FS4401 | 1 | 2 | 7 | 15 | 62 | 112 | 199 |
| Jeju | 3 | 1 | 5 | 17 | 67 | 131 | 224 |

Note: Start_nonsyn: non-synonymous mutations of start codon; Stop_nonsyn: non-synonymous mutation of termination codon; Premature_stop: nonsense mutation, the triplet codon mutates into a stop codon; Synonymous: synonymous mutation in the gene region; Nonsynonymous: non-synonymous mutations in the gene region; Intergenic：SNP in the intergenic region.

Table S7 The results of InDel annotation with 138A as the reference sequence

| Sample ID | I-gene-middle | D-gene-middle | Intergenic | Total |
|---|---|---|---|---|
| 138B | 2 | 0 | 12 | 14 |
| FS4401 | 6 | 13 | 45 | 64 |
| Jeju | 9 | 18 | 57 | 84 |

Note: I-gene-middle：insertion in CDS; D-gene-middle: deletion in CDS; Intergenic：Intergenic: InDel in the intergenic region.

Table S8 The type of genetic mutation caused by InDel with 138A as the reference sequence

| Sample ID | Frame shifted | Other change | CDS with InDel |
|---|---|---|---|
| 138B | 0 | 2 | 2 |
| FS4401 | 13 | 2 | 15 |
| Jeju | 21 | 4 | 25 |

Note: Frame shifted: InDel results in a frame-shift mutation of the open reading frame; Other Change: InDel has no significant effect on the open read frame; CDS with InDel: InDel in the gene region.

Table S9 The cytoplasmic genotypes of 43 materials and the identification result by CMS makers

| Sample ID | cytoplasmic genotypes | Identification of orf300a | Identification of orf507, orf456, cox2 and acc D-U |
|---|---|---|---|
| 18Q5025 | normal | normal | normal |
| 18Q5038 | normal | normal | normal |
| 18Q5043 | normal | normal | normal |
| 18Q5044 | normal | normal | normal |
| 18Q5048 | normal | normal | normal |
| 18Q5050 | normal | normal | normal |
| 18Q5055 | normal | normal | normal |
| 18Q5064 | normal | normal | normal |
| 18Q5109 | normal | normal | normal |
| 18Q5110 | normal | normal | normal |
| 18Q5111 | normal | normal | normal |
| 18Q5117 | normal | normal | normal |
| 18Q5120 | normal | normal | normal |
| 18Q5121 | CMS | CMS | normal |
| 18Q5132 | normal | normal | normal |
| 18Q5142 | normal | normal | normal |
| 18Q5144 | normal | normal | normal |
| 18Q5146 | normal | normal | normal |
| 18Q5169 | normal | normal | normal |
| 18Q5249 | normal | normal | normal |
| 18Q5250 | normal | normal | normal |
| 18Q5253 | normal | normal | normal |
| 18Q5268 | normal | normal | normal |
| 18Q5269 | normal | normal | normal |
| 18Q5270 | normal | normal | normal |
| 18Q5271 | normal | normal | normal |
| 18Q5273 | CMS | CMS | normal |
| 18Q5281 | normal | normal | normal |
| 18Q5423 | CMS | CMS | normal |
| 18Q5424 | normal | normal | normal |
| 18Q5425 | CMS | CMS | normal |
| 18Q5430 | normal | normal | normal |
| 18Q5439 | normal | normal | normal |
| 18Q5463 | normal | normal | normal |
| 18Q5464 | normal | normal | normal |
| 18Q5465 | CMS | CMS | normal |
| 18Q5466 | normal | normal | normal |
| 18Q5494 | normal | normal | normal |
| 18Q5496 | CMS | CMS | normal |
| 18Q5533 | CMS | CMS | normal |

| | | | |
|---|---|---|---|
| 18Q5562 | normal | normal | normal |
| 18Q5633 | normal | normal | normal |
| 18Q5634 | normal | normal | normal |

Table S10 Oligonucleotides used in this study

| Primer names | Forward (5′ – 3′) | Reverse (5′ – 3′) | Reference | Application |
|---|---|---|---|---|
| orf456 | ATGCCCAAAAGTCCCATGTA | TTACTCGGTTGCTCCATTGT | 32 | RT-PCR |
| orf507 | ATGCCCAAAAGTCCCATGTA | TTAAAAAGCGCTAAACAAATTGC | 33 | RT-PCR |
| cox2 | GATGCAGCGGAACCATGGCAATTA | ACTGCACTGACCATAGTAAACTCC | 30 | RT-PCR |
| control | | | | SCAR-PCR |
| cox2 SCAR | GTCGGGAGAACTACCTAACTA | GGCTACCTAGTGATTTACAAGCA | 30 | SCAR-PCR |
| atp6 SCAR | AGTCCACTTGAACAATTTGAAATAATC | GTTCCGTACTTTACTTACGAGC | 30 | SCAR-PCR |
| acc D-U | GTGATTGGATTTCTATGCGG | GGAATGCCGTTTATTTGGCC | 48 | SCAR-PCR |
| orf292a | ATGAGACAAAGGAGAGCACTTAGACAATTC | TCACACGACAGGTGCACGATCTAC | In this study | RT-PCR |
| orf300a | ATGTTCTCACTCTTAAAAAAATTAAGAGC | TTAGGATTTCCAATTCCAATGC | In this study | RT-PCR |
| orf300a | AGAGCAGTTCAACGCAGAGCAG | CCGATCTTTTTGTCGCCCCTGA | In this study | real-time PCR |
| orf262a | ATGAAAAATCGTTCCACTCGCAGC | TTACGCGGGTGAAGCTTGGG | In this study | RT-PCR |
| orf262a | TCTCCGTCGGACTCCCTTATCG | GCTCTTCGTTCTCCCCGTTGTT | In this study | real-time PCR |
| sdh3 | ATGAATATCCTTCGCCCCTTATCTC | TCAATTTTGCACAGTCATTTCAATC | In this study | RT-PCR |
| rpl2 | ATGAGACAAAGGAGAGCACTTAGAC | TTAGTCTGTATGGGCATTCTGG | In this study | RT-PCR |
| orf157a | CGGCCCTATTGTTCCGATGGAG | GGGCCGGAAGGACTTCTAGTCT | In this study | real-time PCR |
| orf115b | AAGAATTCGGCCTTTCAACGGGT | CCCATTCTGGGTCCGACTGTTTC | In this study | real-time PCR |

Table S11 Sequence variations of mitochondrial genes coding for known and hypothetical proteins between 138A and 138B

| Gene ID | position | Nucleotide variation (138B→138A) | Codon mutate | aa mutate |
|---|---|---|---|---|
| *orf229a* | 31116 | G→C | AGT→ACT | S→T |
| *orf138a* | 96376 | C→A | GCA→GAA | A→E |
| *orf337a* | 148817 | C→A | CAA→AAA | Q→K |
| *orf675a* | 151284 | G→A | GAT→AAT | D→N |
| *orf249a* | 169197 | C→G | CCA→GCA | P→A |
| | 169315 | T→C | TCT→TCC | S→S |
| *mat-R* | 283488 | A→G | GCA→GCG | A→A |
| *orf104c* | 333230 | C→G | ACA→AGA | T→R |
| | 333235 | T→G | ATT→ATG | I→M |
| *orfB* | 311237-311698 | AAACTGTTG | | -NSL |
| *orf25* | 162719-163306 | CTGCATATT | | -NMQ |

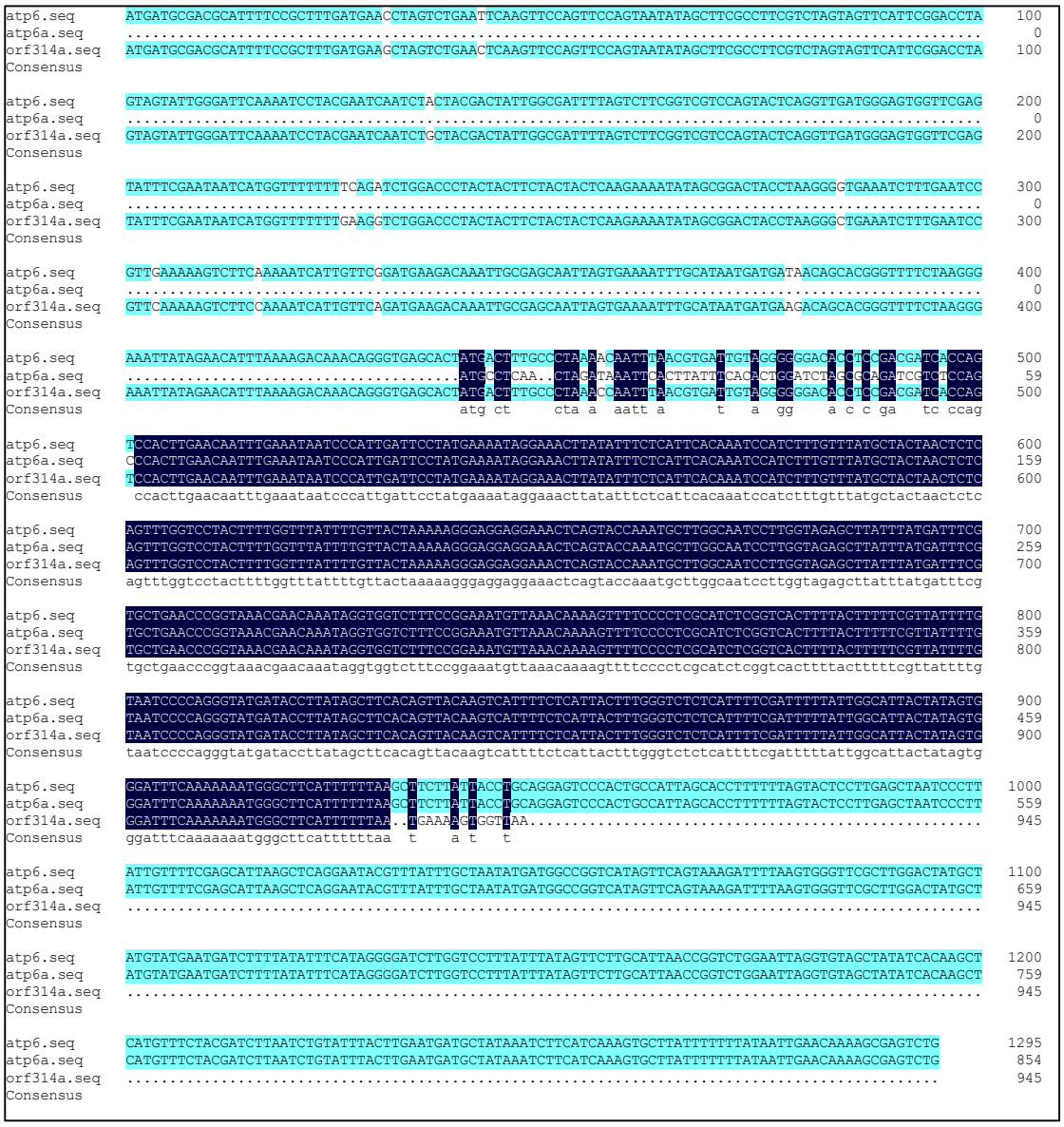


Figure S1 The sequences *atp6* in 138A and 138B

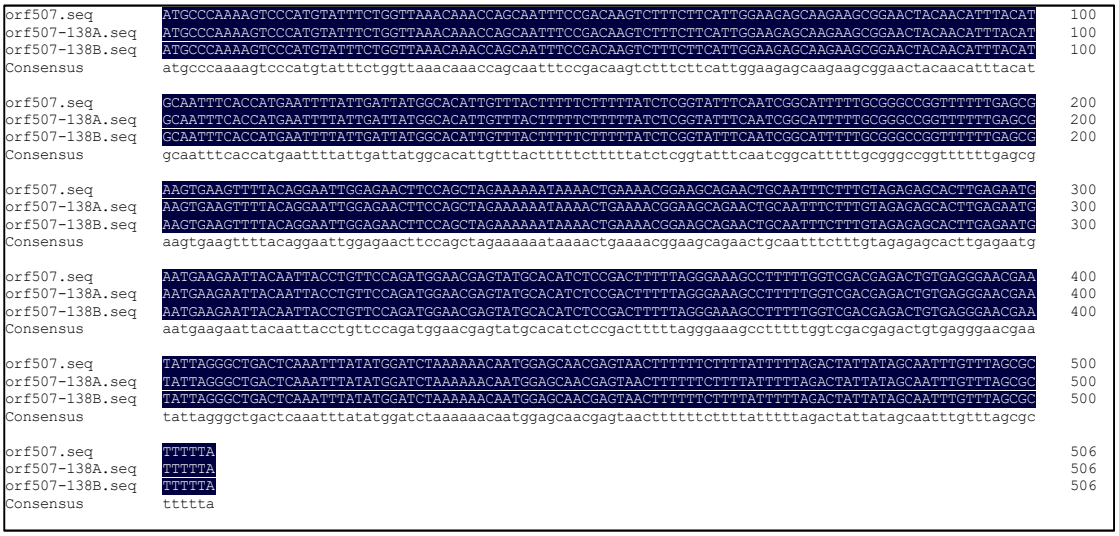


Figure S2 The sequences *orf507* in 138A and 138B