Supplementary Tables S1-S6.

Table S1. The repeats analysis results among plastomes and mitogenomes of the genus *Gastrodia.*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Number** | **Location** | **Start** | **End** | **Location** | **Start** | **End** |
| 1 | OR004100 | 23958 | 24298 | OR004100 | 23958 | 24298 |
| 2 | OR004100 | 23964 | 24271 | OR004100 | 23964 | 24271 |
| 3 | OR004100 | 38870 | 39171 | OR004100 | 38870 | 39171 |
| 4 | OR004100 | 19285 | 19877 | OR004101 | 53761 | 54353 |
| 5 | OR004100 | 20228 | 20527 | OR004128 | 13177 | 13476 |
| 6 | OR004109 | 2800 | 3347 | OR004109 | 2800 | 3347 |
| 7 | OR004109 | 10360 | 10744 | OR004109 | 10360 | 10744 |
| 8 | OR004109 | 22595 | 23747 | OR004101 | 4447 | 5599 |
| 9 | OR004109 | 17414 | 18356 | OR004101 | 448 | 1390 |
| 10 | OR004109 | 19507 | 20140 | OR004101 | 2540 | 3173 |
| 11 | OR004109 | 18355 | 18949 | OR004101 | 1397 | 1991 |
| 12 | OR004109 | 1 | 444 | OR004101 | 5649 | 6092 |
| 13 | OR004109 | 712 | 1150 | OR004101 | 6371 | 6809 |
| 14 | OR004109 | 18952 | 19329 | OR004101 | 1991 | 2368 |
| 15 | OR004109 | 17061 | 17413 | OR004101 | 96 | 448 |
| 16 | OR004109 | 1207 | 1554 | OR004101 | 6861 | 7208 |
| 17 | OR004109 | 3539 | 4414 | OR004138 | 2506 | 3381 |
| 18 | OR004110 | 8174 | 8575 | OR004110 | 8174 | 8575 |
| 19 | OR004110 | 7840 | 8175 | OR004110 | 7840 | 8175 |
| 20 | OR004111 | 15887 | 16370 | OR004100 | 19510 | 19993 |
| 21 | OR004111 | 19280 | 19649 | OR004111 | 19280 | 19649 |
| 22 | OR004111 | 20773 | 21521 | OR004101 | 44814 | 45562 |
| 23 | OR004111 | 17588 | 18235 | OR004101 | 39802 | 40449 |
| 24 | OR004111 | 20773 | 21335 | OR004101 | 44814 | 45376 |
| 25 | OR004111 | 20362 | 20773 | OR004101 | 44404 | 44815 |
| 26 | OR004111 | 21521 | 21899 | OR004101 | 45561 | 45939 |
| 27 | OR004111 | 15567 | 15899 | OR004101 | 53078 | 53410 |
| 28 | OR004111 | 12185 | 12726 | OR004104 | 23304 | 23845 |
| 29 | OR004111 | 16791 | 18351 | OR004107 | 18212 | 19772 |
| 30 | OR004111 | 15432 | 16370 | OR004107 | 16847 | 17785 |
| 31 | OR004111 | 17588 | 18235 | OR004107 | 19009 | 19656 |
| 32 | OR004111 | 21524 | 22122 | OR004107 | 22963 | 23561 |
| 33 | OR004111 | 20773 | 21335 | OR004107 | 22191 | 22753 |
| 34 | OR004111 | 20222 | 20773 | OR004107 | 21641 | 22192 |
| 35 | OR004111 | 15887 | 16370 | OR004107 | 17302 | 17785 |
| 36 | OR004111 | 19760 | 20225 | OR004107 | 21180 | 21645 |
| 37 | OR004111 | 18791 | 19218 | OR004107 | 20210 | 20637 |
| 38 | OR004111 | 20362 | 20773 | OR004107 | 21781 | 22192 |
| 39 | OR004111 | 21521 | 21899 | OR004107 | 22960 | 23338 |
| 40 | OR004111 | 15567 | 15899 | OR004107 | 16982 | 17314 |
| 41 | OR004112 | 11209 | 11657 | OR004109 | 10274 | 10722 |
| 42 | OR004112 | 11187 | 11571 | OR004112 | 11187 | 11571 |
| 43 | OR004113 | 1907 | 3357 | OR004113 | 19470 | 20920 |
| 44 | OR004113 | 658 | 1321 | OR004113 | 18251 | 18914 |
| 45 | OR004113 | 1 | 656 | OR004113 | 17590 | 18245 |
| 46 | OR004113 | 7895 | 8611 | OR004102 | 17301 | 18017 |
| 47 | OR004114 | 13009 | 13457 | OR004109 | 10274 | 10722 |
| 48 | OR004114 | 13009 | 13457 | OR004112 | 11209 | 11657 |
| 49 | OR004114 | 13095 | 13479 | OR004114 | 13095 | 13479 |
| 50 | OR004115 | 3565 | 4058 | OR004105 | 13813 | 14306 |
| 51 | OR004115 | 3543 | 4029 | OR004105 | 13791 | 14277 |
| 52 | OR004115 | 2580 | 3388 | OR004106 | 12862 | 13670 |
| 53 | OR004115 | 3565 | 4058 | OR004107 | 16310 | 16803 |
| 54 | OR004115 | 3543 | 4029 | OR004107 | 16339 | 16825 |
| 55 | OR004115 | 3565 | 4058 | OR004108 | 5256 | 5749 |
| 56 | OR004115 | 3543 | 4029 | OR004108 | 5234 | 5720 |
| 57 | OR004101 | 18367 | 22262 | OR004100 | 5856 | 9751 |
| 58 | OR004101 | 15215 | 17052 | OR004100 | 3287 | 5124 |
| 59 | OR004101 | 51771 | 52693 | OR004100 | 20963 | 21885 |
| 60 | OR004101 | 14469 | 15216 | OR004100 | 2542 | 3289 |
| 61 | OR004101 | 23115 | 23798 | OR004100 | 10550 | 11233 |
| 62 | OR004101 | 22311 | 22870 | OR004100 | 9749 | 10308 |
| 63 | OR004101 | 53761 | 54277 | OR004100 | 19361 | 19877 |
| 64 | OR004101 | 52038 | 52453 | OR004100 | 21203 | 21618 |
| 65 | OR004101 | 13308 | 13702 | OR004100 | 1383 | 1777 |
| 66 | OR004101 | 53109 | 53487 | OR004100 | 20151 | 20529 |
| 67 | OR004101 | 14041 | 14386 | OR004100 | 2116 | 2461 |
| 68 | OR004101 | 28072 | 28411 | OR004100 | 18929 | 19268 |
| 69 | OR004101 | 54432 | 54752 | OR004100 | 18886 | 19206 |
| 70 | OR004101 | 14483 | 14800 | OR004100 | 2556 | 2873 |
| 71 | OR004101 | 6861 | 7606 | OR004109 | 1207 | 1952 |
| 72 | OR004101 | 24062 | 24942 | OR004101 | 41898 | 42778 |
| 73 | OR004101 | 27131 | 27836 | OR004101 | 38957 | 39662 |
| 74 | OR004101 | 42060 | 42739 | OR004101 | 24101 | 24780 |
| 75 | OR004101 | 25199 | 25872 | OR004101 | 40960 | 41633 |
| 76 | OR004101 | 32413 | 33011 | OR004101 | 36148 | 36746 |
| 77 | OR004101 | 29846 | 30427 | OR004101 | 34469 | 35050 |
| 78 | OR004101 | 26419 | 26985 | OR004101 | 26419 | 26985 |
| 79 | OR004101 | 32413 | 32957 | OR004101 | 36202 | 36746 |
| 80 | OR004101 | 25898 | 26419 | OR004101 | 40376 | 40897 |
| 81 | OR004101 | 34665 | 35162 | OR004101 | 36091 | 36588 |
| 82 | OR004101 | 34723 | 35162 | OR004101 | 32571 | 33010 |
| 83 | OR004101 | 34723 | 35162 | OR004101 | 36149 | 36588 |
| 84 | OR004101 | 32571 | 33010 | OR004101 | 36149 | 36588 |
| 85 | OR004101 | 33367 | 33774 | OR004101 | 33367 | 33774 |
| 86 | OR004101 | 36086 | 36476 | OR004101 | 29846 | 30236 |
| 87 | OR004101 | 36086 | 36476 | OR004101 | 34660 | 35050 |
| 88 | OR004101 | 29846 | 30236 | OR004101 | 34660 | 35050 |
| 89 | OR004101 | 33348 | 33734 | OR004101 | 33348 | 33734 |
| 90 | OR004101 | 30055 | 30420 | OR004101 | 30055 | 30420 |
| 91 | OR004101 | 34476 | 34841 | OR004101 | 34476 | 34841 |
| 92 | OR004101 | 37337 | 37702 | OR004101 | 37337 | 37702 |
| 93 | OR004101 | 38957 | 39296 | OR004101 | 27497 | 27836 |
| 94 | OR004101 | 31640 | 31978 | OR004101 | 34331 | 34669 |
| 95 | OR004101 | 31271 | 31604 | OR004101 | 31271 | 31604 |
| 96 | OR004101 | 32695 | 33028 | OR004101 | 32695 | 33028 |
| 97 | OR004101 | 37979 | 38309 | OR004101 | 37979 | 38309 |
| 98 | OR004101 | 32285 | 32615 | OR004101 | 32285 | 32615 |
| 99 | OR004101 | 33855 | 34179 | OR004101 | 35284 | 35608 |
| 100 | OR004101 | 37177 | 37498 | OR004101 | 29292 | 29613 |
| 101 | OR004101 | 28415 | 28735 | OR004101 | 38056 | 38376 |
| 102 | OR004101 | 38381 | 38691 | OR004101 | 38381 | 38691 |
| 103 | OR004101 | 34331 | 34636 | OR004101 | 31673 | 31978 |
| 104 | OR004101 | 34331 | 34636 | OR004101 | 35759 | 36064 |
| 105 | OR004101 | 31673 | 31978 | OR004101 | 35759 | 36064 |
| 106 | OR004101 | 28735 | 29039 | OR004101 | 37753 | 38057 |
| 107 | OR004101 | 37972 | 38274 | OR004101 | 32320 | 32622 |
| 108 | OR004119 | 9850 | 10442 | OR004115 | 16346 | 16938 |
| 109 | OR004119 | 10738 | 11138 | OR004115 | 17230 | 17630 |
| 110 | OR004119 | 9041 | 9352 | OR004115 | 15546 | 15857 |
| 111 | OR004119 | 8544 | 8855 | OR004115 | 15045 | 15356 |
| 112 | OR004119 | 4827 | 5155 | OR004106 | 10874 | 11202 |
| 113 | OR004119 | 2116 | 2427 | OR004106 | 8874 | 9185 |
| 114 | OR004120 | 11650 | 12366 | OR004113 | 7895 | 8611 |
| 115 | OR004120 | 11686 | 12447 | OR004102 | 17337 | 18098 |
| 116 | OR004120 | 11650 | 12366 | OR004102 | 17301 | 18017 |
| 117 | OR004121 | 3120 | 3780 | OR004116 | 85 | 745 |
| 118 | OR004121 | 3091 | 3736 | OR004116 | 129 | 774 |
| 119 | OR004122 | 12805 | 13282 | OR004114 | 12974 | 13451 |
| 120 | OR004122 | 12710 | 13247 | OR004103 | 16957 | 17494 |
| 121 | OR004123 | 9870 | 10593 | OR004102 | 31803 | 32526 |
| 122 | OR004123 | 9832 | 10469 | OR004102 | 31765 | 32402 |
| 123 | OR004123 | 10003 | 10607 | OR004102 | 31936 | 32540 |
| 124 | OR004123 | 13627 | 13964 | OR004106 | 23805 | 24142 |
| 125 | OR004124 | 1761 | 2209 | OR004109 | 10274 | 10722 |
| 126 | OR004124 | 1761 | 2209 | OR004112 | 11209 | 11657 |
| 127 | OR004124 | 1761 | 2209 | OR004114 | 13009 | 13457 |
| 128 | OR004124 | 1787 | 2262 | OR004124 | 1787 | 2262 |
| 129 | OR004125 | 1468 | 2081 | OR004125 | 1468 | 2081 |
| 130 | OR004125 | 1432 | 2043 | OR004125 | 1432 | 2043 |
| 131 | OR004126 | 5040 | 5644 | OR004123 | 10003 | 10607 |
| 132 | OR004126 | 5040 | 5644 | OR004102 | 31936 | 32540 |
| 133 | OR004126 | 14405 | 14719 | MF070101 | 19207 | 19521 |
| 134 | OR004127 | 4113 | 4505 | OR004100 | 1201 | 1593 |
| 135 | OR004127 | 5471 | 5788 | OR004100 | 2556 | 2873 |
| 136 | OR004127 | 4113 | 4430 | OR004100 | 1201 | 1518 |
| 137 | OR004127 | 13053 | 13797 | OR004109 | 11666 | 12410 |
| 138 | OR004127 | 14419 | 15140 | OR004109 | 13044 | 13765 |
| 139 | OR004127 | 11989 | 12486 | OR004109 | 10615 | 11112 |
| 140 | OR004127 | 11991 | 12333 | OR004109 | 10617 | 10959 |
| 141 | OR004127 | 3269 | 3767 | OR004101 | 12281 | 12779 |
| 142 | OR004127 | 4500 | 4977 | OR004101 | 13512 | 13989 |
| 143 | OR004127 | 4567 | 4977 | OR004101 | 13579 | 13989 |
| 144 | OR004127 | 5471 | 5788 | OR004101 | 14483 | 14800 |
| 145 | OR004127 | 11194 | 11718 | OR004135 | 2010 | 2534 |
| 146 | OR004127 | 1987 | 2485 | OR004106 | 14688 | 15186 |
| 147 | OR004127 | 1601 | 1984 | OR004106 | 14303 | 14686 |
| 148 | OR004128 | 527 | 916 | OR004100 | 18879 | 19268 |
| 149 | OR004128 | 577 | 916 | OR004100 | 18929 | 19268 |
| 150 | OR004128 | 534 | 854 | OR004100 | 18886 | 19206 |
| 151 | OR004128 | 1561 | 2335 | OR004101 | 36979 | 37753 |
| 152 | OR004128 | 3918 | 4547 | OR004101 | 32342 | 32971 |
| 153 | OR004128 | 3989 | 4533 | OR004101 | 32413 | 32957 |
| 154 | OR004128 | 3989 | 4533 | OR004101 | 36202 | 36746 |
| 155 | OR004128 | 606 | 1024 | OR004101 | 38273 | 38691 |
| 156 | OR004128 | 1 | 396 | OR004101 | 38904 | 39299 |
| 157 | OR004128 | 484 | 854 | OR004101 | 54432 | 54802 |
| 158 | OR004128 | 11653 | 12020 | OR004101 | 32155 | 32522 |
| 159 | OR004128 | 577 | 943 | OR004101 | 28072 | 28438 |
| 160 | OR004128 | 577 | 916 | OR004101 | 28072 | 28411 |
| 161 | OR004128 | 1816 | 2137 | OR004101 | 37177 | 37498 |
| 162 | OR004128 | 1816 | 2137 | OR004101 | 29292 | 29613 |
| 163 | OR004128 | 534 | 854 | OR004101 | 54432 | 54752 |
| 164 | OR004128 | 3107 | 3418 | OR004101 | 35895 | 36206 |
| 165 | OR004128 | 1024 | 1326 | OR004101 | 37972 | 38274 |
| 166 | OR004128 | 1024 | 1326 | OR004101 | 32320 | 32622 |
| 167 | OR004128 | 1612 | 1977 | OR004128 | 1612 | 1977 |
| 168 | OR004128 | 4 | 343 | OR004128 | 4 | 343 |
| 169 | OR004128 | 2770 | 3105 | OR004128 | 2770 | 3105 |
| 170 | OR004128 | 2437 | 2767 | OR004128 | 2437 | 2767 |
| 171 | OR004128 | 4237 | 4556 | OR004128 | 4237 | 4556 |
| 172 | OR004128 | 5679 | 5995 | OR004128 | 5679 | 5995 |
| 173 | OR004128 | 2079 | 2388 | OR004128 | 3499 | 3808 |
| 174 | OR004129 | 4559 | 5234 | OR004113 | 8007 | 8682 |
| 175 | OR004129 | 4630 | 5234 | OR004129 | 4630 | 5234 |
| 176 | OR004130 | 2614 | 3093 | OR004112 | 11209 | 11688 |
| 177 | OR004130 | 2645 | 3182 | OR004122 | 12710 | 13247 |
| 178 | OR004130 | 2645 | 3182 | OR004103 | 16957 | 17494 |
| 179 | OR004132 | 5686 | 6346 | OR004116 | 85 | 745 |
| 180 | OR004132 | 5730 | 6375 | OR004116 | 129 | 774 |
| 181 | OR004132 | 5686 | 6346 | OR004121 | 3120 | 3780 |
| 182 | OR004132 | 5730 | 6375 | OR004121 | 3091 | 3736 |
| 183 | OR004132 | 5843 | 6422 | OR004121 | 3044 | 3623 |
| 184 | OR004132 | 5552 | 6071 | OR004104 | 22987 | 23506 |
| 185 | OR004133 | 1069 | 1574 | OR004110 | 7937 | 8442 |
| 186 | OR004133 | 1333 | 1638 | OR004126 | 5403 | 5708 |
| 187 | OR004133 | 881 | 1211 | OR004104 | 22939 | 23269 |
| 188 | OR004135 | 8661 | 8978 | OR004100 | 1201 | 1518 |
| 189 | OR004135 | 7418 | 8611 | OR004101 | 11100 | 12293 |
| 190 | OR004135 | 9110 | 9871 | OR004101 | 13579 | 14340 |
| 191 | OR004135 | 7418 | 8028 | OR004101 | 11100 | 11710 |
| 192 | OR004135 | 4758 | 5176 | OR004101 | 8834 | 9252 |
| 193 | OR004135 | 9110 | 9520 | OR004101 | 13579 | 13989 |
| 194 | OR004135 | 8034 | 8415 | OR004101 | 11716 | 12097 |
| 195 | OR004135 | 9887 | 10610 | OR004123 | 9870 | 10593 |
| 196 | OR004135 | 10011 | 10648 | OR004123 | 9832 | 10469 |
| 197 | OR004135 | 9873 | 10477 | OR004123 | 10003 | 10607 |
| 198 | OR004135 | 9873 | 10477 | OR004126 | 5040 | 5644 |
| 199 | OR004135 | 1460 | 2014 | OR004127 | 10643 | 11197 |
| 200 | OR004135 | 7320 | 7818 | OR004127 | 1987 | 2485 |
| 201 | OR004135 | 9110 | 9520 | OR004127 | 4567 | 4977 |
| 202 | OR004135 | 6935 | 7318 | OR004127 | 1601 | 1984 |
| 203 | OR004135 | 8602 | 8978 | OR004127 | 4054 | 4430 |
| 204 | OR004135 | 8661 | 8978 | OR004127 | 4113 | 4430 |
| 205 | OR004135 | 1155 | 1463 | OR004127 | 10339 | 10647 |
| 206 | OR004135 | 857 | 1157 | OR004127 | 10040 | 10340 |
| 207 | OR004135 | 9873 | 10655 | OR004102 | 31758 | 32540 |
| 208 | OR004135 | 9887 | 10610 | OR004102 | 31803 | 32526 |
| 209 | OR004135 | 10011 | 10648 | OR004102 | 31765 | 32402 |
| 210 | OR004135 | 9873 | 10477 | OR004102 | 31936 | 32540 |
| 211 | OR004135 | 6770 | 8028 | OR004106 | 14138 | 15396 |
| 212 | OR004135 | 7418 | 8028 | OR004106 | 14786 | 15396 |
| 213 | OR004135 | 7320 | 7818 | OR004106 | 14688 | 15186 |
| 214 | OR004135 | 6935 | 7318 | OR004106 | 14303 | 14686 |
| 215 | OR004135 | 8034 | 8415 | OR004106 | 15400 | 15781 |
| 216 | OR004136 | 6842 | 7421 | OR004121 | 3044 | 3623 |
| 217 | OR004136 | 6842 | 7421 | OR004132 | 5843 | 6422 |
| 218 | OR004137 | 5389 | 6282 | MF070100 | 113333 | 114226 |
| 219 | OR004138 | 2317 | 3381 | OR004109 | 3350 | 4414 |
| 220 | OR004138 | 1 | 1009 | OR004109 | 11597 | 12605 |
| 221 | OR004138 | 70 | 814 | OR004109 | 11666 | 12410 |
| 222 | OR004138 | 1 | 675 | OR004109 | 11597 | 12271 |
| 223 | OR004138 | 4614 | 5102 | OR004101 | 8611 | 9099 |
| 224 | OR004138 | 70 | 814 | OR004127 | 13053 | 13797 |
| 225 | OR004138 | 815 | 1345 | OR004127 | 13799 | 14329 |
| 226 | OR004138 | 3704 | 4294 | OR004135 | 3618 | 4208 |
| 227 | OR004138 | 1766 | 2313 | OR004138 | 1766 | 2313 |
| 228 | OR004103 | 36594 | 36934 | OR004103 | 36594 | 36934 |
| 229 | OR004139 | 1125 | 2000 | OR004109 | 3539 | 4414 |
| 230 | OR004139 | 3292 | 3840 | OR004109 | 1667 | 2215 |
| 231 | OR004139 | 2526 | 2948 | OR004109 | 2568 | 2990 |
| 232 | OR004139 | 3925 | 4272 | OR004109 | 1207 | 1554 |
| 233 | OR004139 | 2169 | 2489 | OR004109 | 3027 | 3347 |
| 234 | OR004139 | 3925 | 4510 | OR004101 | 6623 | 7208 |
| 235 | OR004139 | 3925 | 4272 | OR004101 | 6861 | 7208 |
| 236 | OR004139 | 212 | 802 | OR004135 | 3618 | 4208 |
| 237 | OR004139 | 208 | 2000 | OR004138 | 2506 | 4298 |
| 238 | OR004139 | 1125 | 2000 | OR004138 | 2506 | 3381 |
| 239 | OR004139 | 1998 | 2716 | OR004138 | 1766 | 2484 |
| 240 | OR004139 | 212 | 802 | OR004138 | 3704 | 4294 |
| 241 | OR004139 | 2169 | 2716 | OR004139 | 2169 | 2716 |
| 242 | OR004140 | 33 | 857 | OR004102 | 14806 | 15630 |
| 243 | OR004141 | 1130 | 2024 | OR004109 | 11377 | 12271 |
| 244 | OR004141 | 336 | 1101 | OR004109 | 10611 | 11376 |
| 245 | OR004141 | 1350 | 2024 | OR004109 | 11597 | 12271 |
| 246 | OR004141 | 2781 | 3142 | OR004109 | 13043 | 13404 |
| 247 | OR004141 | 342 | 684 | OR004109 | 10617 | 10959 |
| 248 | OR004141 | 342 | 684 | OR004127 | 11991 | 12333 |
| 249 | OR004141 | 4 | 311 | OR004127 | 11649 | 11956 |
| 250 | OR004141 | 1350 | 2024 | OR004138 | 1 | 675 |
| 251 | OR004141 | 2025 | 2696 | OR004138 | 674 | 1345 |
| 252 | OR004142 | 187 | 647 | OR004100 | 11413 | 11873 |
| 253 | OR004104 | 10311 | 10688 | OR004104 | 23129 | 23506 |
| 254 | OR004106 | 14786 | 15396 | OR004101 | 11100 | 11710 |
| 255 | OR004106 | 15400 | 15781 | OR004101 | 11716 | 12097 |
| 256 | OR004106 | 20201 | 20500 | OR004102 | 16418 | 16717 |
| 257 | OR004106 | 4670 | 5102 | OR004106 | 6200 | 6632 |
| 258 | OR004107 | 17302 | 17934 | OR004100 | 19361 | 19993 |
| 259 | OR004107 | 17418 | 17934 | OR004100 | 19361 | 19877 |
| 260 | OR004107 | 17302 | 17785 | OR004100 | 19510 | 19993 |
| 261 | OR004107 | 21781 | 22753 | OR004101 | 44404 | 45376 |
| 262 | OR004107 | 18954 | 19656 | OR004101 | 39747 | 40449 |
| 263 | OR004107 | 20416 | 21095 | OR004101 | 42060 | 42739 |
| 264 | OR004107 | 20416 | 21095 | OR004101 | 24101 | 24780 |
| 265 | OR004107 | 19009 | 19656 | OR004101 | 39802 | 40449 |
| 266 | OR004107 | 22764 | 23338 | OR004101 | 45365 | 45939 |
| 267 | OR004107 | 22191 | 22753 | OR004101 | 44814 | 45376 |
| 268 | OR004107 | 17418 | 17934 | OR004101 | 53761 | 54277 |
| 269 | OR004107 | 24375 | 24814 | OR004101 | 47427 | 47866 |
| 270 | OR004107 | 23337 | 23774 | OR004101 | 45939 | 46376 |
| 271 | OR004107 | 21781 | 22192 | OR004101 | 44404 | 44815 |
| 272 | OR004107 | 22960 | 23338 | OR004101 | 45561 | 45939 |
| 273 | OR004107 | 24818 | 25151 | OR004101 | 47868 | 48201 |
| 274 | OR004107 | 16982 | 17314 | OR004101 | 53078 | 53410 |
| 275 | OR004107 | 16310 | 16803 | OR004105 | 13813 | 14306 |
| 276 | OR004107 | 16339 | 16825 | OR004105 | 13791 | 14277 |
| 277 | OR004108 | 5256 | 5749 | OR004105 | 13813 | 14306 |
| 278 | OR004108 | 5234 | 5720 | OR004105 | 13791 | 14277 |
| 279 | OR004108 | 5203 | 5618 | OR004105 | 13760 | 14175 |
| 280 | OR004108 | 5256 | 5749 | OR004107 | 16310 | 16803 |
| 281 | OR004108 | 5234 | 5720 | OR004107 | 16339 | 16825 |
| 282 | MF070086 | 27788 | 28095 | OR004120 | 7620 | 7927 |
| 283 | MF070086 | 44749 | 45569 | OR004105 | 24248 | 25068 |
| 284 | MF070086 | 41273 | 41953 | OR004105 | 20457 | 21137 |
| 285 | MF070086 | 46492 | 47088 | OR004105 | 25983 | 26579 |
| 286 | MF070086 | 55725 | 56067 | OR004105 | 5525 | 5867 |
| 287 | MF070086 | 58424 | 58740 | OR004105 | 3194 | 3510 |
| 288 | MF070087 | 26058 | 26696 | OR004109 | 12601 | 13239 |
| 289 | MF070087 | 25359 | 25723 | OR004109 | 13672 | 14036 |
| 290 | MF070087 | 41538 | 42686 | OR004102 | 32747 | 33895 |
| 291 | MF070087 | 39544 | 40217 | OR004102 | 35091 | 35764 |
| 292 | MF070087 | 26521 | 26908 | OR004138 | 794 | 1181 |
| 293 | MF070087 | 58984 | 59439 | MF070085 | 13914 | 14369 |
| 294 | MF070088 | 60281 | 60747 | OR004114 | 15422 | 15888 |
| 295 | MF070088 | 14064 | 14372 | OR004129 | 6910 | 7218 |
| 296 | MF070088 | 24434 | 25022 | OR004130 | 5970 | 6558 |
| 297 | MF070088 | 22547 | 22928 | OR004130 | 8186 | 8567 |
| 298 | MF070088 | 23684 | 24014 | OR004130 | 7079 | 7409 |
| 299 | MF070088 | 44995 | 45783 | OR004103 | 783 | 1571 |
| 300 | MF070088 | 44680 | 44985 | OR004103 | 477 | 782 |
| 301 | MF070088 | 58971 | 59361 | MF070088 | 82395 | 82785 |
| 302 | MF070089 | 94459 | 95085 | OR004143 | 547 | 1173 |
| 303 | MF070089 | 110746 | 288 | MF070086 | 62295 | 62595 |
| 304 | MF070089 | 77505 | 78141 | MF070087 | 60556 | 61192 |
| 305 | MF070089 | 31131 | 31676 | MF070087 | 66418 | 66963 |
| 306 | MF070089 | 6333 | 6726 | MF070087 | 66418 | 66811 |
| 307 | MF070089 | 31283 | 31676 | MF070087 | 66418 | 66811 |
| 308 | MF070089 | 109517 | 109979 | MF070088 | 53728 | 54190 |
| 309 | MF070089 | 109673 | 109979 | MF070088 | 53884 | 54190 |
| 310 | MF070089 | 6333 | 6787 | MF070089 | 31283 | 31737 |
| 311 | MF070089 | 6333 | 6726 | MF070089 | 31283 | 31676 |
| 312 | MF070090 | 310229 | 311055 | OR004109 | 5146 | 5972 |
| 313 | MF070090 | 309379 | 309805 | OR004109 | 4027 | 4453 |
| 314 | MF070090 | 312914 | 313219 | OR004109 | 8176 | 8481 |
| 315 | MF070090 | 405199 | 405802 | OR004114 | 17438 | 18041 |
| 316 | MF070090 | 73477 | 74809 | OR004115 | 8588 | 9920 |
| 317 | MF070090 | 82515 | 83590 | OR004115 | 16364 | 17439 |
| 318 | MF070090 | 75920 | 76715 | OR004115 | 10666 | 11461 |
| 319 | MF070090 | 82497 | 83089 | OR004115 | 16346 | 16938 |
| 320 | MF070090 | 69784 | 70332 | OR004115 | 5342 | 5890 |
| 321 | MF070090 | 81626 | 82167 | OR004115 | 15401 | 15942 |
| 322 | MF070090 | 84477 | 84877 | OR004115 | 18257 | 18657 |
| 323 | MF070090 | 79328 | 79718 | OR004115 | 13383 | 13773 |
| 324 | MF070090 | 70618 | 70979 | OR004115 | 6164 | 6525 |
| 325 | MF070090 | 84113 | 84471 | OR004115 | 17898 | 18256 |
| 326 | MF070090 | 81771 | 82082 | OR004115 | 15546 | 15857 |
| 327 | MF070090 | 71571 | 71874 | OR004115 | 7246 | 7549 |
| 328 | MF070090 | 81111 | 81411 | OR004115 | 14896 | 15196 |
| 329 | MF070090 | 382345 | 383943 | OR004116 | 13605 | 15203 |
| 330 | MF070090 | 384648 | 385108 | OR004116 | 15997 | 16457 |
| 331 | MF070090 | 384178 | 384621 | OR004116 | 15542 | 15985 |
| 332 | MF070090 | 385225 | 385601 | OR004116 | 16535 | 16911 |
| 333 | MF070090 | 82497 | 83089 | OR004119 | 9850 | 10442 |
| 334 | MF070090 | 81771 | 82082 | OR004119 | 9041 | 9352 |
| 335 | MF070090 | 127872 | 128265 | OR004120 | 6717 | 7110 |
| 336 | MF070090 | 127416 | 127831 | OR004121 | 6852 | 7267 |
| 337 | MF070090 | 93417 | 93985 | OR004122 | 1765 | 2333 |
| 338 | MF070090 | 97810 | 98192 | OR004102 | 7408 | 7790 |
| 339 | MF070090 | 97464 | 97803 | OR004102 | 7068 | 7407 |
| 340 | MF070090 | 278862 | 279316 | OR004134 | 10859 | 11313 |
| 341 | MF070090 | 278371 | 278749 | OR004134 | 10402 | 10780 |
| 342 | MF070090 | 59915 | 60321 | OR004107 | 7277 | 7683 |
| 343 | MF070090 | 108847 | 109375 | OR004108 | 575 | 1103 |
| 344 | MF070090 | 107484 | 107789 | OR004108 | 14598 | 14903 |
| 345 | MF070090 | 308154 | 308618 | MF070086 | 7300 | 7764 |
| 346 | MF070090 | 231060 | 231391 | MF070086 | 49050 | 49381 |
| 347 | MF070090 | 126415 | 126745 | MF070086 | 84716 | 85046 |
| 348 | MF070090 | 111373 | 111673 | MF070086 | 62295 | 62595 |
| 349 | MF070090 | 176165 | 177937 | MF070087 | 1 | 1773 |
| 350 | MF070090 | 24483 | 24796 | MF070087 | 1767 | 2080 |
| 351 | MF070090 | 119254 | 119566 | MF070088 | 52237 | 52549 |
| 352 | MF070090 | 198575 | 198881 | MF070088 | 53884 | 54190 |
| 353 | MF070090 | 198575 | 199660 | MF070089 | 109673 | 110758 |
| 354 | MF070090 | 111393 | 111796 | MF070089 | 8 | 411 |
| 355 | MF070090 | 198575 | 198881 | MF070089 | 109673 | 109979 |
| 356 | MF070090 | 111373 | 111673 | MF070089 | 110746 | 288 |
| 357 | MF070090 | 309379 | 309766 | MF070090 | 309379 | 309766 |
| 358 | MF070090 | 22391 | 22735 | MF070090 | 409991 | 410335 |
| 359 | MF070090 | 60110 | 60453 | MF070090 | 363685 | 364028 |
| 360 | MF070090 | 309036 | 309372 | MF070090 | 309036 | 309372 |
| 361 | MF070091 | 2677 | 3000 | OR004123 | 489 | 812 |
| 362 | MF070091 | 2200 | 2505 | OR004123 | 1255 | 1560 |
| 363 | MF070091 | 6141 | 6523 | MF070091 | 55383 | 55765 |
| 364 | MF070093 | 39893 | 41213 | OR004102 | 42040 | 43360 |
| 365 | MF070093 | 38791 | 39880 | OR004102 | 40944 | 42033 |
| 366 | MF070095 | 5853 | 6331 | OR004110 | 2417 | 2895 |
| 367 | MF070098 | 20395 | 21710 | OR004116 | 3989 | 5304 |
| 368 | MF070098 | 22384 | 22755 | OR004116 | 2965 | 3336 |
| 369 | MF070098 | 20082 | 20394 | OR004116 | 5300 | 5612 |
| 370 | MF070100 | 7915 | 8297 | OR004114 | 17799 | 18181 |
| 371 | MF070100 | 8311 | 8653 | OR004114 | 18257 | 18599 |
| 372 | MF070100 | 75067 | 75703 | OR004103 | 30633 | 31269 |
| 373 | MF070100 | 39943 | 41084 | OR004108 | 15832 | 16973 |
| 374 | MF070100 | 34312 | 35107 | OR004108 | 21732 | 22527 |
| 375 | MF070100 | 38242 | 38926 | OR004108 | 17917 | 18601 |
| 376 | MF070100 | 36878 | 37270 | OR004108 | 19578 | 19970 |
| 377 | MF070100 | 37613 | 37948 | OR004108 | 18901 | 19236 |
| 378 | MF070100 | 36568 | 36880 | OR004108 | 19969 | 20281 |
| 379 | MF070100 | 50726 | 51065 | MF070087 | 20970 | 21309 |
| 380 | MF070100 | 83283 | 83585 | MF070087 | 20935 | 21237 |
| 381 | MF070100 | 43873 | 44422 | MF070088 | 41410 | 41959 |
| 382 | MF070100 | 47921 | 48713 | MF070090 | 103635 | 104427 |
| 383 | MF070100 | 21395 | 21871 | MF070090 | 19387 | 19863 |
| 384 | MF070100 | 112267 | 112674 | MF070093 | 1050 | 1457 |
| 385 | MF070101 | 16882 | 18027 | OR004126 | 108 | 1253 |
| 386 | MF070102 | 29461 | 29876 | OR004100 | 21203 | 21618 |
| 387 | MF070102 | 31001 | 31589 | OR004101 | 50184 | 50772 |
| 388 | MF070102 | 29461 | 29876 | OR004101 | 52038 | 52453 |
| 389 | MF070102 | 8737 | 9150 | OR004124 | 6152 | 6565 |
| 390 | MF070102 | 7808 | 8181 | OR004124 | 7343 | 7716 |
| 391 | MF070102 | 7373 | 7708 | OR004124 | 7789 | 8124 |
| 392 | MF070102 | 16480 | 17075 | OR004103 | 42360 | 42955 |
| 393 | NC037409 | 21105 | 24518 | MF070101 | 11073 | 14486 |
| 394 | NC037409 | 20905 | 21336 | MW879162 | 19687 | 20118 |
| 395 | NC037409 | 24677 | 25059 | MW879162 | 23354 | 23736 |
| 396 | NC037409 | 25064 | 25365 | MW879162 | 23742 | 24043 |
| 397 | MW879162 | 14725 | 15722 | OR031839 | 11734 | 12731 |
| 398 | MW879162 | 5686 | 6583 | OR031839 | 2934 | 3831 |
| 399 | MW879162 | 13229 | 13709 | OR031839 | 10192 | 10672 |
| 400 | MW879162 | 19650 | 20131 | OR031839 | 16750 | 17231 |
| 401 | MW879162 | 377 | 864 | OR031839 | 27682 | 28169 |
| 402 | MW879162 | 16255 | 16744 | OR031839 | 13279 | 13768 |
| 403 | MW879162 | 25090 | 25595 | OR031839 | 22416 | 22921 |
| 404 | MW879162 | 1391 | 1890 | OR031839 | 28748 | 29247 |
| 405 | MW879162 | 23226 | 23739 | OR031839 | 20411 | 20924 |
| 406 | MW879162 | 25066 | 25573 | OR031839 | 22392 | 22899 |
| 407 | MW879162 | 11835 | 12347 | OR031839 | 8825 | 9337 |
| 408 | MW879162 | 17554 | 18080 | OR031839 | 14587 | 15113 |
| 409 | MW879162 | 18638 | 19192 | OR031839 | 15671 | 16225 |
| 410 | MW879162 | 4732 | 5361 | OR031839 | 1950 | 2579 |
| 411 | MW879162 | 3015 | 3804 | OR031839 | 44 | 833 |
| 412 | OR031839 | 13802 | 14588 | MW879162 | 16778 | 17564 |
| 413 | MW879162 | 25610 | 26331 | OR031839 | 22912 | 23633 |
| 414 | MW879162 | 2185 | 2847 | OR031839 | 29540 | 30202 |
| 415 | NC037409 | 25064 | 25365 | OR031839 | 20928 | 21229 |
| 416 | NC037409 | 25064 | 25365 | MW879162 | 23742 | 24043 |
| 417 | MW879162 | 23742 | 24043 | OR031839 | 20928 | 21229 |
| 418 | MW879162 | 1879 | 2194 | OR031839 | 29233 | 29548 |
| 419 | MW879162 | 4235 | 4555 | OR031839 | 1410 | 1730 |
| 420 | MW879162 | 18068 | 18404 | OR031839 | 15104 | 15440 |
| 421 | MW879162 | 14146 | 14487 | OR031839 | 11139 | 11480 |
| 422 | MW879162 | 22883 | 23224 | OR031839 | 20062 | 20403 |
| 423 | MW879162 | 10843 | 11192 | OR031839 | 7969 | 8318 |
| 424 | MW879162 | 11388 | 11749 | OR031839 | 8439 | 8800 |
| 425 | MW879162 | 26359 | 26724 | OR031839 | 23655 | 24020 |
| 426 | MW879162 | 10200 | 10576 | OR031839 | 7262 | 7638 |
| 427 | NC037409 | 24677 | 25059 | MW879162 | 23354 | 23736 |
| 428 | NC037409 | 24677 | 25059 | OR031839 | 20539 | 20921 |
| 429 | MW879162 | 23354 | 23736 | OR031839 | 20539 | 20921 |
| 430 | MW879162 | 9125 | 9519 | OR031839 | 6197 | 6591 |
| 431 | MW879162 | 20348 | 20757 | OR031839 | 17488 | 17897 |
| 432 | MW879162 | 19687 | 20118 | OR031839 | 16787 | 17218 |
| 433 | MW879162 | 23738 | 24158 | OR031839 | 20924 | 21344 |
| 434 | MW879162 | 21722 | 22134 | OR031839 | 18882 | 19294 |
| 435 | MW879162 | 8388 | 8720 | OR031839 | 5424 | 5756 |
| 436 | MW879162 | 25042 | 25366 | OR031839 | 22368 | 22692 |
| 437 | MW879162 | 21017 | 21337 | OR031839 | 18179 | 18499 |

Table S2. The list of simple sequences repeats of the *Gastrodia* *pubilabiata*’s plastome*.*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Start | End | Sequence | Unit |
| Mononucleotide Repeat | 4570 | 4583 | TTTTTTTTTTTTTT | T |
| Mononucleotide Repeat | 25904 | 25916 | TTTTTTTTTTTTT | T |
| Mononucleotide Repeat | 4144 | 4155 | AAAAAAAAAAAA | A |
| Mononucleotide Repeat | 7663 | 7674 | TTTTTTTTTTTT | T |
| Mononucleotide Repeat | 23890 | 23901 | TTTTTTTTTTTT | T |
| Mononucleotide Repeat | 25353 | 25364 | TTTTTTTTTTTT | T |
| Mononucleotide Repeat | 6629 | 6639 | TTTTTTTTTTT | T |
| Mononucleotide Repeat | 12742 | 12752 | TTTTTTTTTTT | T |
| Mononucleotide Repeat | 13744 | 13754 | TTTTTTTTTTT | T |
| Mononucleotide Repeat | 29237 | 29247 | AAAAAAAAAAA | A |
| Mononucleotide Repeat | 29539 | 29549 | AAAAAAAAAAA | A |
| Mononucleotide Repeat | 6097 | 6106 | TTTTTTTTTT | T |
| Mononucleotide Repeat | 16551 | 16560 | TTTTTTTTTT | T |
| Mononucleotide Repeat | 19886 | 19895 | AAAAAAAAAA | A |
| Mononucleotide Repeat | 26790 | 26799 | TTTTTTTTTT | T |
| Mononucleotide Repeat | 29746 | 29755 | AAAAAAAAAA | A |
| Dinucleotide Repeat | 27425 | 27437 | TATATATATATA | TA |
| Dinucleotide Repeat | 13457 | 13468 | TATATATATATA | TA |
| Dinucleotide Repeat | 1282 | 1292 | TATATATATA | TA |
| Dinucleotide Repeat | 24470 | 24480 | TATATATATA | TA |
| Dinucleotide Repeat | 9430 | 9439 | TATATATATA | TA |
| Trinucleotide Repeat | 6168 | 6180 | TATTATTATTAT | TAT |
| Trinucleotide Repeat | 15101 | 15113 | TATTATTATTAT | TAT |
| Trinucleotide Repeat | 30448 | 30460 | ATAATAATAATA | ATA |
| Trinucleotide Repeat | 30467 | 30479 | ATAATAATAATA | ATA |
| Tetranucleotide Repeat | 6140 | 6152 | TATTTATTTATT | TATT |
| Tetranucleotide Repeat | 10504 | 10516 | AGATAGATAGAT | AGAT |
| Tetranucleotide Repeat | 13674 | 13686 | AAATAAATAAAT | AAAT |
| Tetranucleotide Repeat | 27408 | 27420 | TATTTATTTATT | TATT |
| Tetranucleotide Repeat | 28325 | 28337 | ATTTATTTATTT | ATTT |
| Tetranucleotide Repeat | 29150 | 29162 | AAATAAATAAAT | AAAT |
| Tetranucleotide Repeat | 11859 | 11870 | TAAATAAATAAA | TAAA |
| Tetranucleotide Repeat | 18011 | 18022 | ACCTACCTACCT | ACCT |
| Tetranucleotide Repeat | 19685 | 19696 | TTATTTATTTAT | TTAT |
| Tetranucleotide Repeat | 25474 | 25485 | ATAAATAAATAA | ATAA |
| Tetranucleotide Repeat | 27382 | 27393 | TTATTTATTTAT | TTAT |
| Tetranucleotide Repeat | 27444 | 27455 | TTATTTATTTAT | TTAT |
| Tetranucleotide Repeat | 27475 | 27486 | TTATTTATTTAT | TTAT |
| Pentanucleotide Repeat | 27497 | 27517 | TTATATTATATTATATTATA | TTATA |
| Pentanucleotide Repeat | 21618 | 21635 | ATAAAATAAAATAAA | ATAAA |
| Pentanucleotide Repeat | 21642 | 21659 | ATAAAATAAAATAAA | ATAAA |
| Pentanucleotide Repeat | 21666 | 21683 | ATAAAATAAAATAAA | ATAAA |
| Pentanucleotide Repeat | 21690 | 21707 | ATAAAATAAAATAAA | ATAAA |
| Pentanucleotide Repeat | 10836 | 10852 | TTTATTTTATTTTAT | TTTAT |
| Pentanucleotide Repeat | 5067 | 5081 | TTATATTATATTATA | TTATA |
| Pentanucleotide Repeat | 7174 | 7188 | CTTTACTTTACTTTA | CTTTA |
| Pentanucleotide Repeat | 27196 | 27210 | TATTTTATTTTATTT | TATTT |
| Pentanucleotide Repeat | 27587 | 27601 | TTATTTTATTTTATT | TTATT |
| Pentanucleotide Repeat | 11010 | 11023 | TTATATTATA | TTATA |
| Pentanucleotide Repeat | 23880 | 23893 | TTTTATTTTA | TTTTA |
| Pentanucleotide Repeat | 5797 | 5809 | TTTACTTTAC | TTTAC |
| Pentanucleotide Repeat | 8209 | 8221 | ATTTTATTTT | ATTTT |
| Pentanucleotide Repeat | 12052 | 12064 | TTTATTTTAT | TTTAT |
| Pentanucleotide Repeat | 22909 | 22921 | TTTATTTTAT | TTTAT |
| Pentanucleotide Repeat | 27353 | 27365 | TATTATATTA | TATTA |
| Pentanucleotide Repeat | 30291 | 30303 | ATATAATATA | ATATA |
| Pentanucleotide Repeat | 1200 | 1211 | ATTATATTAT | ATTAT |
| Pentanucleotide Repeat | 1253 | 1264 | ATTATATTAT | ATTAT |
| Pentanucleotide Repeat | 5149 | 5160 | TTAATTTAAT | TTAAT |
| Pentanucleotide Repeat | 5210 | 5221 | TTTAATTTAA | TTTAA |
| Pentanucleotide Repeat | 5852 | 5863 | TTTTATTTTA | TTTTA |
| Pentanucleotide Repeat | 6445 | 6456 | ATTTGATTTG | ATTTG |
| Pentanucleotide Repeat | 6985 | 6996 | TTTATTTTAT | TTTAT |
| Pentanucleotide Repeat | 7207 | 7218 | TAAAATAAAA | TAAAA |
| Pentanucleotide Repeat | 15856 | 15867 | TAAATTAAAT | TAAAT |
| Pentanucleotide Repeat | 15941 | 15952 | TAAAATAAAA | TAAAA |
| Pentanucleotide Repeat | 17468 | 17479 | TATTATATTA | TATTA |
| Pentanucleotide Repeat | 26074 | 26085 | ATTATATTAT | ATTAT |
| Pentanucleotide Repeat | 30314 | 30325 | TATAATATAA | TATAA |
| Pentanucleotide Repeat | 828 | 838 | AAATAAAATA | AAATA |
| Pentanucleotide Repeat | 1269 | 1279 | TTATATTATA | TTATA |
| Pentanucleotide Repeat | 1320 | 1330 | TATTTTATTT | TATTT |
| Pentanucleotide Repeat | 2030 | 2040 | TTATTTTATT | TTATT |
| Pentanucleotide Repeat | 2696 | 2706 | AAAATAAAAT | AAAAT |
| Pentanucleotide Repeat | 3862 | 3872 | TTTTATTTTA | TTTTA |
| Pentanucleotide Repeat | 4727 | 4737 | TTAATTTAAT | TTAAT |
| Pentanucleotide Repeat | 6088 | 6098 | TATATTATAT | TATAT |
| Pentanucleotide Repeat | 7732 | 7742 | TAATATAATA | TAATA |
| Pentanucleotide Repeat | 8318 | 8328 | TCTTGTCTTG | TCTTG |
| Pentanucleotide Repeat | 8799 | 8809 | ATATTATATT | ATATT |
| Pentanucleotide Repeat | 10735 | 10745 | ATAATATAAT | ATAAT |
| Pentanucleotide Repeat | 15084 | 15094 | TATATTATAT | TATAT |
| Pentanucleotide Repeat | 15323 | 15333 | TTTCGTTTCG | TTTCG |
| Pentanucleotide Repeat | 15954 | 15964 | AATAAAATAA | AATAA |
| Pentanucleotide Repeat | 17030 | 17040 | CAACCCAACC | CAACC |
| Pentanucleotide Repeat | 18257 | 18267 | AAAATAAAAT | AAAAT |
| Pentanucleotide Repeat | 23667 | 23677 | GTAATGTAAT | GTAAT |
| Pentanucleotide Repeat | 27345 | 27355 | TATTATATTA | TATTA |
| Pentanucleotide Repeat | 27610 | 27620 | TTATTTTATT | TTATT |

Table S3. Summarized BLASTN results of putative gene transfers.

|  |  |  |  |
| --- | --- | --- | --- |
| **Region** | **Mitogenome counts** | **Plastome counts** | **Organelle** |
| 112350 | 12 | 2028 | mitogenome |
| 344550 | 70 | 2020 | mitogenome |
| 531300 | 2 | 1988 | mitogenome |
| 501750 | 98 | 1986 | mitogenome |
| 381900 | 578 | 1984 | mitogenome |
| 723150 | 552 | 1978 | mitogenome |
| 381300 | 568 | 1974 | mitogenome |
| 864000 | 540 | 1970 | mitogenome |
| 154950 | 528 | 1950 | mitogenome |
| 848700 | 508 | 1932 | mitogenome |
| 617400 | 48 | 1862 | mitogenome |
| 400200 | 332 | 998 | mitogenome |
| 698250 | 332 | 998 | mitogenome |
| 636300 | 52 | 998 | mitogenome |
| 136500 | 42 | 998 | mitogenome |
| 312900 | 42 | 998 | mitogenome |
| 636450 | 32 | 998 | mitogenome |
| 637200 | 24 | 998 | mitogenome |
| 636900 | 18 | 998 | mitogenome |
| 569700 | 18 | 998 | mitogenome |
| 213300 | 4 | 998 | mitogenome |
| 399450 | 0 | 998 | mitogenome |
| 617550 | 0 | 650 | mitogenome |
| 781500 | 0 | 394 | mitogenome |
| 261000 | 2 | 310 | mitogenome |
| 637050 | 0 | 212 | mitogenome |
| 212550 | 0 | 170 | mitogenome |
| 213000 | 0 | 146 | mitogenome |
| 505500 | 0 | 120 | mitogenome |
| 152550 | 548 | 44 | mitogenome |
| 381450 | 480 | 32 | mitogenome |
| 849000 | 652 | 18 | mitogenome |
| 153150 | 534 | 14 | mitogenome |
| 382800 | 504 | 14 | mitogenome |
| 382350 | 498 | 14 | mitogenome |
| 381750 | 478 | 14 | mitogenome |
| 344400 | 0 | 14 | mitogenome |
| 535050 | 370 | 12 | mitogenome |
| 601950 | 298 | 12 | mitogenome |
| 619500 | 296 | 12 | mitogenome |
| 260850 | 0 | 12 | mitogenome |
| 381000 | 614 | 10 | mitogenome |
| 723750 | 484 | 10 | mitogenome |
| 848850 | 482 | 10 | mitogenome |
| 381150 | 434 | 10 | mitogenome |
| 509550 | 424 | 10 | mitogenome |
| 848550 | 406 | 10 | mitogenome |
| 381600 | 400 | 10 | mitogenome |
| 722550 | 362 | 10 | mitogenome |
| 722700 | 338 | 10 | mitogenome |
| 863400 | 312 | 10 | mitogenome |
| 766200 | 4 | 10 | mitogenome |
| 152700 | 550 | 8 | mitogenome |
| 153300 | 538 | 8 | mitogenome |
| 382500 | 496 | 8 | mitogenome |
| 863250 | 394 | 8 | mitogenome |
| 863850 | 366 | 8 | mitogenome |
| 722850 | 354 | 8 | mitogenome |
| 160650 | 282 | 8 | mitogenome |
| 863700 | 266 | 8 | mitogenome |
| 563100 | 256 | 8 | mitogenome |
| 136050 | 0 | 6 | mitogenome |
| 313500 | 0 | 6 | mitogenome |
| 21300 | 550 | 4 | mitogenome |
| 154350 | 546 | 4 | mitogenome |
| 154050 | 534 | 4 | mitogenome |
| 153000 | 532 | 4 | mitogenome |
| 152850 | 530 | 4 | mitogenome |
| 153450 | 528 | 4 | mitogenome |
| 116400 | 526 | 4 | mitogenome |
| 371700 | 456 | 4 | mitogenome |
| 864450 | 380 | 4 | mitogenome |
| 534600 | 372 | 4 | mitogenome |
| 162450 | 324 | 4 | mitogenome |
| 866850 | 310 | 4 | mitogenome |
| 866700 | 276 | 4 | mitogenome |
| 867000 | 248 | 4 | mitogenome |
| 866550 | 246 | 4 | mitogenome |
| 265800 | 590 | 2 | mitogenome |
| 524100 | 554 | 2 | mitogenome |
| 152400 | 550 | 2 | mitogenome |
| 509100 | 540 | 2 | mitogenome |
| 375750 | 514 | 2 | mitogenome |
| 483600 | 504 | 2 | mitogenome |
| 154200 | 492 | 2 | mitogenome |
| 525300 | 428 | 2 | mitogenome |
| 154500 | 422 | 2 | mitogenome |
| 286950 | 420 | 2 | mitogenome |
| 152250 | 418 | 2 | mitogenome |
| 668400 | 410 | 2 | mitogenome |
| 849150 | 406 | 2 | mitogenome |
| 601800 | 398 | 2 | mitogenome |
| 374250 | 394 | 2 | mitogenome |
| 162750 | 366 | 2 | mitogenome |
| 827250 | 364 | 2 | mitogenome |
| 382650 | 362 | 2 | mitogenome |
| 514350 | 356 | 2 | mitogenome |
| 745500 | 356 | 2 | mitogenome |
| 723900 | 350 | 2 | mitogenome |
| 517650 | 344 | 2 | mitogenome |
| 517800 | 344 | 2 | mitogenome |
| 514500 | 336 | 2 | mitogenome |
| 525150 | 328 | 2 | mitogenome |
| 843600 | 314 | 2 | mitogenome |
| 843000 | 308 | 2 | mitogenome |
| 587400 | 308 | 2 | mitogenome |
| 508200 | 306 | 2 | mitogenome |
| 843300 | 306 | 2 | mitogenome |
| 815100 | 298 | 2 | mitogenome |
| 745800 | 296 | 2 | mitogenome |
| 745950 | 294 | 2 | mitogenome |
| 843450 | 276 | 2 | mitogenome |
| 707850 | 228 | 2 | mitogenome |
| 266250 | 226 | 2 | mitogenome |
| 267900 | 180 | 2 | mitogenome |
| 21150 | 166 | 2 | mitogenome |
| 511500 | 144 | 2 | mitogenome |
| 759000 | 144 | 2 | mitogenome |
| 163050 | 130 | 2 | mitogenome |
| 116100 | 128 | 2 | mitogenome |
| 511650 | 124 | 2 | mitogenome |
| 21450 | 41 | 8792 | Plastome |
| 19200 | 46 | 8606 | Plastome |
| 18300 | 27 | 7521 | Plastome |
| 16950 | 45 | 5302 | Plastome |
| 20100 | 39 | 5293 | Plastome |
| 20400 | 30 | 5277 | Plastome |
| 17700 | 40 | 5237 | Plastome |
| 20550 | 249 | 5201 | Plastome |
| 17550 | 41 | 5196 | Plastome |
| 17100 | 36 | 5193 | Plastome |
| 18900 | 50 | 5179 | Plastome |
| 21000 | 39 | 5173 | Plastome |
| 20250 | 36 | 5151 | Plastome |
| 19950 | 28 | 5004 | Plastome |
| 21150 | 36 | 4910 | Plastome |
| 27900 | 32 | 4687 | Plastome |
| 11250 | 18 | 3616 | Plastome |
| 6150 | 8 | 2954 | Plastome |
| 13950 | 2 | 1068 | Plastome |
| 20700 | 2 | 1035 | Plastome |
| 3000 | 2 | 628 | Plastome |
| 16050 | 9 | 325 | Plastome |
| 9000 | 2 | 44 | Plastome |

Table S4. The NGS results of *Gastrodia* *pubilabiata* with two different methods (NovaSeq and Pacbio Sequel).

|  |  |  |
| --- | --- | --- |
| **Method** | NovaSeq | Pacbio sequel |
| **Number of reads** | 224,926,562 | 746,493 |
| **Number of bases** | 33,963,910,862 | 3,883,634,904 |
| **Number of trimmed reads** | 224,926,562 | 168,074 |
| **Number of trimmed bases** | 32,230,907,981 | 728,627,957 |
| **Voucher specimen** | 2020-0086 | 2020-0086 |

Table S5. The depth-coverage of mitogenomes of *Gastrodia* *pubilabiata*.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Mitogenome** | **Length** | **Depth** | **Mitogenome** | **Length** | **Depth** |
| OR004100 | 64,159 | 566.5 | OR004122 | 17,020 | 57.4 |
| OR004101 | 55,369 | 588.2 | OR004123 | 16,000 | 93.7 |
| OR004102 | 51,695 | 70.6 | OR004124 | 15,716 | 60 |
| OR004103 | 50,872 | 68.4 | OR004125 | 15,367 | 53.2 |
| OR004104 | 40,269 | 55.9 | OR004126 | 15,363 | 62.2 |
| OR004105 | 30,820 | 175.1 | OR004127 | 15,299 | 332.8 |
| OR004106 | 26,177 | 102.7 | OR004128 | 14,604 | 627.2 |
| OR004107 | 25,386 | 78.2 | OR004129 | 14,457 | 48.8 |
| OR004108 | 23,997 | 68.5 | OR004130 | 13,960 | 58.9 |
| OR004109 | 23,795 | 400.5 | OR004131 | 12,366 | 215 |
| OR004110 | 23,203 | 60.4 | OR004132 | 12,304 | 52.5 |
| OR004111 | 22,560 | 54.4 | OR004133 | 12,137 | 56.8 |
| OR004112 | 21,174 | 54.8 | OR004134 | 12,001 | 55.5 |
| OR004113 | 21,009 | 77.1 | OR004135 | 10,912 | 214.3 |
| OR004114 | 20,400 | 53.5 | OR004136 | 10,833 | 58.6 |
| OR004115 | 19,639 | 90 | OR004137 | 10,196 | 81.8 |
| OR004116 | 18,952 | 61.6 | OR004138 | 5,102 | 430.2 |
| OR004117 | 18,932 | 60.1 | OR004139 | 4,510 | 40.1 |
| OR004118 | 18,639 | 59.7 | OR004140 | 3,750 | 135.1 |
| OR004119 | 17,862 | 147.6 | OR004141 | 3,420 | 73 |
| OR004120 | 17,267 | 61 | OR004142 | 1,438 | 220.9 |
| OR004121 | 17,047 | 74.3 | OR004143 | 1,371 | 542.9 |

Table S6. Used sequences information in this study.

|  |  |  |
| --- | --- | --- |
| **Scientific Name** | **Accession** | **Organelle** |
| *Acer miaotaiense* | MZ636518 | Mitogenome |
| *Aconitum kusnezoffii* | NC053920 | Mitogenome |
| *Ajuga reptans* | NC023103 | Mitogenome |
| *Allium cepa* | NC030100 | Mitogenome |
| *Arabidopsis thaliana* | NC037304 | Mitogenome |
| *Asclepias syriaca* | NC022796 | Mitogenome |
| *Asparagus officinalis* | NC053642 | Mitogenome |
| *Beta macrocarpa* | FQ378026 | Mitogenome |
| *Betula pendula* | LT855379 | Mitogenome |
| *Bombax ceiba* | NC038052 | Mitogenome |
| *Butomus umbellatus* | NC021399 | Mitogenome |
| *Camellia sinensis* | NC043914 | Mitogenome |
| *Capsicum annuum* | NC024624 | Mitogenome |
| *Cycas taitungensis* | NC010303 | Mitogenome |
| *Daucus carota* subsp*. sativus* | NC017855 | Mitogenome |
| *Eucalyptus grandis* | NC040010 | Mitogenome |
| *Euonymus alatus* | NC053921 | Mitogenome |
| *Fagus sylvatica* | NC050960 | Mitogenome |
| *Gastrodia elata* | MF070084 | Mitogenome |
| *Gastrodia elata* | MF070085 | Mitogenome |
| *Gastrodia elata* | MF070086 | Mitogenome |
| *Gastrodia elata* | MF070087 | Mitogenome |
| *Gastrodia elata* | MF070088 | Mitogenome |
| *Gastrodia elata* | MF070089 | Mitogenome |
| *Gastrodia elata* | MF070090 | Mitogenome |
| *Gastrodia elata* | MF070091 | Mitogenome |
| *Gastrodia elata* | MF070092 | Mitogenome |
| *Gastrodia elata* | MF070093 | Mitogenome |
| *Gastrodia elata* | MF070094 | Mitogenome |
| *Gastrodia elata* | MF070095 | Mitogenome |
| *Gastrodia elata* | MF070096 | Mitogenome |
| *Gastrodia elata* | MF070097 | Mitogenome |
| *Gastrodia elata* | MF070098 | Mitogenome |
| *Gastrodia elata* | MF070099 | Mitogenome |
| *Gastrodia elata* | MF070100 | Mitogenome |
| *Gastrodia elata* | MF070101 | Mitogenome |
| *Gastrodia elata* | MF070102 | Mitogenome |
| *Gastrodia pubilabiata* | OR004100-OR004143 | Mitogenome |
| *Geranium maderense* | NC027000 | Mitogenome |
| *Ginkgo biloba* | NC027976 | Mitogenome |
| *Glycine soja* | NC039768 | Mitogenome |
| *Hibiscus cannabinus* | NC035549 | Mitogenome |
| *Ilex pubescens* | MK714017 | Mitogenome |
| *Luffa acutangula* | NC050067 | Mitogenome |
| *Magnolia biondii* | NC049134 | Mitogenome |
| *Manihot esculenta* | NC045136 | Mitogenome |
| *Nelumbo nucifera* | NC030753 | Mitogenome |
| *Nitraria tangutorum* | MK431824 | Mitogenome |
| *Nymphaea colorata* | NC037468 | Mitogenome |
| *Ophioglossum californicum* | NC030900 | Mitogenome |
| *Oryza sativa* | NC011033 | Mitogenome |
| *Phlegmariurus squarrosus* | NC017755 | Mitogenome |
| *Phoenix dactylifera* | NC016740 | Mitogenome |
| *Pinus taeda* | NC039746 | Mitogenome |
| *Platycodon grandiflorus* | NC035958 | Mitogenome |
| *Prunus avium* | NC044768 | Mitogenome |
| *Schisandra sphenanthera* | NC042758 | Mitogenome |
| *Spondias mombin* | NC045035 | Mitogenome |
| *Tetracentron sinense* | CM026581 | Mitogenome |
| *Viscum album* | NC029039 | Mitogenome |
| *Vitis vinifera* | NC012119 | Mitogenome |
| *Zelkova schneideriana* | MW717907 | Mitogenome |
| *Abatia parviflora* | MN078139 | Plastome |
| *Acer pseudosieboldianum* | NC046487 | Plastome |
| *Aleurites moluccanus* | MW322810 | Plastome |
| *Allium cepa* | KM088013 | Plastome |
| *Allium cepa* | KM088013 | Plastome |
| *Amborella trichopoda* | NC005086 | Plastome |
| *Amitostigma gracile* | MN200376 | Plastome |
| *Anoectochilus emeiensis* | NC033895 | Plastome |
| *Aphyllorchis montana* | NC030703 | Plastome |
| *Apostasia odorata* | NC030722 | Plastome |
| *Apostasia wallichii* | NC036260 | Plastome |
| *Arisaema erubescens* | NC051541 | Plastome |
| *Aristotelia chilensis* | MT078232 | Plastome |
| *Aspidopterys concava* | OL471043 | Plastome |
| *Aspidopterys obcordata* | NC049898 | Plastome |
| *Averrhoa bilimbi* | MT522015 | Plastome |
| *Averrhoa carambola* | NC033350 | Plastome |
| *Azara serrata* | NC041433 | Plastome |
| *Baccaurea ramiflora* | NC057309 | Plastome |
| *Balakata baccata* | NC057049 | Plastome |
| *Banara guianensis* | NC043896 | Plastome |
| *Bennettiodendron brevipes* | NC043885 | Plastome |
| *Bennettiodendron leprosipes* | NC045898 | Plastome |
| *Biophytum sensitivum* | MT522017 | Plastome |
| *Bischofia polycarpa* | MZ826267 | Plastome |
| *Bletilla striata* | NC028422 | Plastome |
| *Boehmeria spicata* | NC036989 | Plastome |
| *Brassica juncea* | NC028272 | Plastome |
| *Breynia fruticosa* | NC058018 | Plastome |
| *Bridelia tomentosa* | MW357611 | Plastome |
| *Bulbophyllum inconspicuum* | MN200377 | Plastome |
| *Bunchosia argentea* | NC041491 | Plastome |
| *Byrsonima coccolobifolia* | NC037191 | Plastome |
| *Byrsonima crassifolia* | NC037192 | Plastome |
| *Calanthe aristulifera* | MN200378 | Plastome |
| *Calypso bulbosa* var*. occidentalis* | NC040980 | Plastome |
| *Carex neurocarpa* | NC036037 | Plastome |
| *Carpinus tschonoskii* | NC039938 | Plastome |
| *Carrierea calycina* | NC043884 | Plastome |
| *Casearia decandra* | MN078142 | Plastome |
| *Casearia glomerata* | NC059787 | Plastome |
| *Casearia velutina* | MN078141 | Plastome |
| *Catha edulis* | KT861471 | Plastome |
| *Cattleya crispata* | NC026568 | Plastome |
| *Celastrus orbiculatus* | MW316708 | Plastome |
| *Cephalanthera longifolia* | NC030704 | Plastome |
| *Cinnamomum camphora* | NC035882 | Plastome |
| *Cleidiocarpon cavaleriei* | MG813873 | Plastome |
| *Cleidion brevipetiolatum* | OL804290 | Plastome |
| *Clematis mandshurica* | OK375873 | Plastome |
| *Cnidoscolus aconitifolius* | MZ045411 | Plastome |
| *Corallorhiza bulbosa* | NC025659 | Plastome |
| *Corallorhiza macrantha* | NC025660 | Plastome |
| *Corallorhiza maculata* | MN200380 | Plastome |
| *Corallorhiza maculata* var*. maculata* | KM390014 | Plastome |
| *Corallorhiza maculata* var*. mexicana* | KM390015 | Plastome |
| *Corallorhiza maculata* var*. occidentalis* | KM390016 | Plastome |
| *Corallorhiza mertensiana* | NC025661 | Plastome |
| *Corallorhiza odontorhiza* | NC025664 | Plastome |
| *Corallorhiza striata* var*. vreelandii* | JX087681 | Plastome |
| *Corallorhiza trifida* | NC025662 | Plastome |
| *Corallorhiza wisteriana* | NC025663 | Plastome |
| *Cornus walteri* | NC058318 | Plastome |
| *Cratoxylum cochinchinense* | MT424754 | Plastome |
| *Cremastra unguiculata* | MN200381 | Plastome |
| *Croton laevigatus* | MN713923 | Plastome |
| *Croton tiglium* | NC040113 | Plastome |
| *Cryptomeria japonica* | NC010548 | Plastome |
| *Cymbidium macrorhizon* | KY354040 | Plastome |
| *Cypripedium formosanum* | NC026772 | Plastome |
| *Cypripedium japonicum* | NC027227 | Plastome |
| *Cyrtosia septentrionalis* | MH615835 | Plastome |
| *Dactylorhiza viridis* var*. coreana* | MN200382 | Plastome |
| *Danxiaorchis singchiana* | NC048523 | Plastome |
| *Dendrobium moniliforme* | MN200384 | Plastome |
| *Deutzianthus tonkinensis* | NC041102 | Plastome |
| *Dianyuea turbinata* | NC054283 | Plastome |
| *Dipodium roseum* | MN200386 | Plastome |
| *Dovyalis caffra* | MN078137 | Plastome |
| *Dryopteris crassirhizoma* | NC050008 | Plastome |
| *Elaeocarpus angustifolius* | MW242787 | Plastome |
| *Elaeocarpus braceanus* | NC054266 | Plastome |
| *Elaeocarpus decipiens* | NC058624 | Plastome |
| *Elaeocarpus glabripetalus* | MW900186 | Plastome |
| *Elaeocarpus japonicus* | NC053654 | Plastome |
| *Elaeocarpus japonicus* var*. yunnanensis* | MW242788 | Plastome |
| *Elaeocarpus sylvestris* | MW196271 | Plastome |
| *Elleanthus sodiroi* | NC027266 | Plastome |
| *Epipactis thunbergii* | MN200387 | Plastome |
| *Epipogium aphyllum* | NC026449 | Plastome |
| *Epipogium roseum* | NC026448 | Plastome |
| *Erycina pusilla* | NC018114 | Plastome |
| *Erythroxylum novogranatense* | NC030601 | Plastome |
| *Eulophia zollingeri* | NC037212 | Plastome |
| *Euonymus alatus* | OK562424 | Plastome |
| *Euonymus europaeus* | MZ567072 | Plastome |
| *Euonymus fortunei* | NC057058 | Plastome |
| *Euonymus hamiltonianus* | NC037518 | Plastome |
| *Euonymus japonicus* | NC028067 | Plastome |
| *Euonymus maackii* | MW771518 | Plastome |
| *Euonymus maackii* | NC057059 | Plastome |
| *Euonymus phellomanus* | NC057060 | Plastome |
| *Euonymus schensianus* | NC036019 | Plastome |
| *Euonymus szechuanensis* | NC047463 | Plastome |
| *Euonymus yunnanensis* | MW770452 | Plastome |
| *Euphorbia ebracteolata* | NC052747 | Plastome |
| *Euphorbia esula* | NC033910 | Plastome |
| *Euphorbia helioscopia* | MN199031 | Plastome |
| *Euphorbia hirta* | NC058203 | Plastome |
| *Euphorbia jolkinii* | LC661698 | Plastome |
| *Euphorbia kansuensis* | MZ962400 | Plastome |
| *Euphorbia kansui* | MH392274 | Plastome |
| *Euphorbia larica* | MN646683 | Plastome |
| *Euphorbia lathyris* | NC052746 | Plastome |
| *Euphorbia maculata* | NC052745 | Plastome |
| *Euphorbia micractina* | OL622067 | Plastome |
| *Euphorbia milii* | MN713924 | Plastome |
| *Euphorbia pekinensis* | NC058897 | Plastome |
| *Euphorbia peplus* | NC058989 | Plastome |
| *Euphorbia smithii* | MN646684 | Plastome |
| *Euphorbia tirucalli* | NC042193 | Plastome |
| *Eurya alata* | NC041510 | Plastome |
| *Eurystyles cotyledon* | NC047204 | Plastome |
| *Eustrephus latifolius* | NC025305 | Plastome |
| *Excoecaria agallocha* | MZ687828 | Plastome |
| *Flacourtia indica* | NC037410 | Plastome |
| *Flacourtia inermis* | MN078138 | Plastome |
| *Flacourtia jangomas* | NC046687 | Plastome |
| *Flacourtia rukam* | NC045859 | Plastome |
| *Flueggea virosa* | NC051502 | Plastome |
| *Fritillaria hupehensis* | NC024736 | Plastome |
| *Galearis cyclochila* | MN200388 | Plastome |
| *Galphimia angustifolia* | NC043795 | Plastome |
| *Garcinia subelliptica* | NC059006 | Plastome |
| *Gastrochilus japonicus* | NC035833 | Plastome |
| *Gastrodia elata* | MN200389 | Plastome |
| *Gastrodia elata* | NC037409 | Plastome |
| *Gastrodia longistyla* | MW879162 | Plastome |
| *Gastrodia pubilabiata* | OR031839 | Plastome |
| *Geranium sibiricum* | NC056382 | Plastome |
| *Ginkgo biloba* | MN443423 | Plastome |
| *Glochidion chodoense* | NC042906 | Plastome |
| *Goodyera rosulacea* | MN200390 | Plastome |
| *Gymnadenia conopsea* | MN200391 | Plastome |
| *Habenaria radiata* | NC035834 | Plastome |
| *Hetaeria sikokiana* | MN200367 | Plastome |
| *Hevea benthamiana* | MT333859 | Plastome |
| *Hevea brasiliensis* | NC015308 | Plastome |
| *Hevea camargoana* | MN781109 | Plastome |
| *Hevea nitida* | MT413435 | Plastome |
| *Hevea pauciflora* | NC059798 | Plastome |
| *Hevea spruceana* | NC059799 | Plastome |
| *Hexalectris warnockii* | MH444822 | Plastome |
| *Holcoglossum lingulatum* | NC041465 | Plastome |
| *Homalium ceylanicum* | NC045235 | Plastome |
| *Homalium cochinchinense* | NC045919 | Plastome |
| *Homalium hainanense* | NC054193 | Plastome |
| *Homalium paniculiflorum* | NC045233 | Plastome |
| *Homalium racemosum* | MN078136 | Plastome |
| *Homalium stenophyllum* | NC045234 | Plastome |
| *Hydrangea serrata* | KY412468 | Plastome |
| *Hypericum ascyron* | MZ424306 | Plastome |
| *Idesia polycarpa* | NC032060 | Plastome |
| *Ilex crenata* | MW528027 | Plastome |
| *Iris gatesii* | NC024936 | Plastome |
| *Iris sanguinea* | NC029227 | Plastome |
| *Isodon rubescens* | NC053708 | Plastome |
| *Itoa orientalis* | NC037411 | Plastome |
| *Jatropha curcas* | NC012224 | Plastome |
| *Kuhlhasseltia nakaiana* | KY354041 | Plastome |
| *Lankesterella ceracifolia* | NC047203 | Plastome |
| *Lecanorchis japonica* | MN200364 | Plastome |
| *Lecanorchis kiusiana* | MN200363 | Plastome |
| *Leptopus cordifolius* | NC058615 | Plastome |
| *Ligustrum quihoui* | NC057246 | Plastome |
| *Limodorum abortivum* | MH590355 | Plastome |
| *Linum grandiflorum* | NC058845 | Plastome |
| *Linum leonii* | MW365714 | Plastome |
| *Linum lewisii* | NC058799 | Plastome |
| *Linum narbonense* | NC058855 | Plastome |
| *Linum strictum* | MW364865 | Plastome |
| *Linum usitatissimum* | NC036356 | Plastome |
| *Liparis auriculata* | MN200365 | Plastome |
| *Lonicera ruprechtiana* | NC056986 | Plastome |
| *Lophira alata* | MZ274135 | Plastome |
| *Lophira lanceolata* | MZ274136 | Plastome |
| *Ludisia discolor* | NC030540 | Plastome |
| *Lycopodium clavatum* | NC040994 | Plastome |
| *Lysimachia congestiflora* | NC045275 | Plastome |
| *Macaranga tanarius* | MW297079 | Plastome |
| *Machilus thunbergii* | NC038204 | Plastome |
| *Mallotus japonicus* | NC057003 | Plastome |
| *Mallotus paniculatus* | NC058595 | Plastome |
| *Mallotus peltatus* | NC047284 | Plastome |
| *Manihot esculenta* | NC010433 | Plastome |
| *Masdevallia coccinea* | NC026541 | Plastome |
| *Maytenus guangxiensis* | NC047301 | Plastome |
| *Monimopetalum chinense* | MK450440 | Plastome |
| *Morus alba* | NC057087 | Plastome |
| *Neofinetia falcata* | KT726909 | Plastome |
| *Neottia acuminata* | NC030709 | Plastome |
| *Neottia camtschatea* | NC030707 | Plastome |
| *Neottia fugongensis* | NC030711 | Plastome |
| *Neottia listeroides* | NC030713 | Plastome |
| *Neottia nidus-avis* | NC016471 | Plastome |
| *Neottia ovata* | NC030712 | Plastome |
| *Neottia pinetorum* | NC030710 | Plastome |
| *Neuwiedia zollingeri* var*. singapureana* | LC199503 | Plastome |
| *Nymphaea tetragona* | NC057565 | Plastome |
| *Oberonia japonica* | NC035832 | Plastome |
| *Olmediella betschleriana* | NC043886 | Plastome |
| *Oncidium sphacelatum* | NC028148 | Plastome |
| *Ophrys sphegodes* | AP018717 | Plastome |
| *Oreorchis patens* | MN200369 | Plastome |
| *Orixa japonica* | NC057647 | Plastome |
| *Oxalis corniculata* | NC051971 | Plastome |
| *Oxalis corymbosa* | NC048890 | Plastome |
| *Oxalis drummondii* | NC043802 | Plastome |
| *Oxalis pes-caprae* | MT537169 | Plastome |
| *Palmorchis pabstii* | NC041190 | Plastome |
| *Paphiopedilum armeniacum* | NC026779 | Plastome |
| *Paphiopedilum dianthum* | NC036958 | Plastome |
| *Paphiopedilum niveum* | NC026776 | Plastome |
| *Parnassia brevistyla* | MG792145 | Plastome |
| *Parnassia chinensis* | MK887918 | Plastome |
| *Parnassia crassifolia* | MK580538 | Plastome |
| *Parnassia delavayi* | MK887917 | Plastome |
| *Parnassia deqenensis* | MK887909 | Plastome |
| *Parnassia epunctulata* | MK887919 | Plastome |
| *Parnassia faberi* | OL450472 | Plastome |
| *Parnassia leptophylla* | MK887913 | Plastome |
| *Parnassia longipetala* | MK887914 | Plastome |
| *Parnassia lutea* | MK887915 | Plastome |
| *Parnassia nubicola* | MK887912 | Plastome |
| *Parnassia oreophila* | MK887916 | Plastome |
| *Parnassia palustris* | NC045280 | Plastome |
| *Parnassia qinghaiensis* | MK887910 | Plastome |
| *Parnassia tenella* | MK887920 | Plastome |
| *Parnassia tibetana* | MK887923 | Plastome |
| *Parnassia trinervis* | NC043951 | Plastome |
| *Parnassia venusta* | MK887911 | Plastome |
| *Parnassia viridiflora* | MK887921 | Plastome |
| *Parnassia wightiana* | MN398191 | Plastome |
| *Pelatantheria scolopendrifolia* | NC035829 | Plastome |
| *Pendulorchis himalaica* | NC041513 | Plastome |
| *Persicaria chinensis* | MN627221 | Plastome |
| *Phalaenopsis equestris* | NC017609 | Plastome |
| *Phragmipedium longifolium* | NC028149 | Plastome |
| *Phyllanthus amarus* | NC047474 | Plastome |
| *Phyllanthus emblica* | NC047477 | Plastome |
| *Phyllanthus urinaria* | OL693862 | Plastome |
| *Pinus thunbergii* | PINCPTRP | Plastome |
| *Platanthera mandarinorum* | MN200370 | Plastome |
| *Pleione bulbocodioides* | NC036342 | Plastome |
| *Plukenetia volubilis* | NC058006 | Plastome |
| *Pogonia japonica* | MN200371 | Plastome |
| *Pogonia minor* | MN200372 | Plastome |
| *Poliothyrsis sinensis* | NC037412 | Plastome |
| *Populus adenopoda* | NC032368 | Plastome |
| *Populus afghanica* | NC045396 | Plastome |
| *Populus alba* | NC008235 | Plastome |
| *Populus alba* var*. pyramidalis* | MK341061 | Plastome |
| *Populus alba* x *Populus glandulosa* | NC058277 | Plastome |
| *Populus angustifolia* | NC037413 | Plastome |
| *Populus balsamifera* | NC024735 | Plastome |
| *Populus cathayana* | NC040874 | Plastome |
| *Populus ciliata* | MW376769 | Plastome |
| *Populus davidiana* | NC032717 | Plastome |
| *Populus davidiana* x *Populus alba* var*. pyramidalis* | NC044462 | Plastome |
| *Populus deltoides* | NC040929 | Plastome |
| *Populus euphratica* | NC024747 | Plastome |
| *Populus fremontii* | NC024734 | Plastome |
| *Populus glandulosa* | NC058278 | Plastome |
| *Populus glauca* | MW376848 | Plastome |
| *Populus gonggaensis* | NC040873 | Plastome |
| *Populus grandidentata* | MW376777 | Plastome |
| *Populus haoana* | NC040872 | Plastome |
| *Populus heterophylla* | MW376781 | Plastome |
| *Populus hopeiensis* | NC040871 | Plastome |
| *Populus ilicifolia* | NC031371 | Plastome |
| *Populus iliensis* | MW376784 | Plastome |
| *Populus intramongolica* | MW376785 | Plastome |
| *Populus kangdingensis* | NC040870 | Plastome |
| *Populus koreana* | NC037414 | Plastome |
| *Populus lasiocarpa* | NC036040 | Plastome |
| *Populus laurifolia* | NC037415 | Plastome |
| *Populus mainlingensis* | MW376794 | Plastome |
| *Populus maximowiczii* | OK110251 | Plastome |
| *Populus mexicana* | NC047300 | Plastome |
| *Populus nigra* | NC037416 | Plastome |
| *Populus ningshanica* | MW376802 | Plastome |
| *Populus pamirica* | MW376803 | Plastome |
| *Populus platyphylla* | MW376804 | Plastome |
| *Populus pruinosa* | NC037417 | Plastome |
| *Populus pseudoglauca* | NC040869 | Plastome |
| *Populus pseudomaximowiczii* | MW376810 | Plastome |
| *Populus qamdoensis* | NC040868 | Plastome |
| *Populus qiongdaoensis* | NC031398 | Plastome |
| *Populus rotundifolia* | NC033876 | Plastome |
| *Populus rotundifolia* var*. duclouxiana* | MK267306 | Plastome |
| *Populus schneideri* | NC040867 | Plastome |
| *Populus shanxiensis* | MW376822 | Plastome |
| *Populus simonii* | NC037418 | Plastome |
| *Populus suaveolens* | MW376826 | Plastome |
| *Populus szechuanica* | NC037419 | Plastome |
| *Populus szechuanica* var*. rockii* | MW376819 | Plastome |
| *Populus szechuanica* var*. tibetica* | MW376833 | Plastome |
| *Populus talassica* | MW376834 | Plastome |
| *Populus tomentosa* | NC040866 | Plastome |
| *Populus tremula* | NC027425 | Plastome |
| *Populus tremula* x *Populus alba* | NC028504 | Plastome |
| *Populus trichocarpa* | NC009143 | Plastome |
| *Populus trinervis* | NC037420 | Plastome |
| *Populus ussuriensis* | MW376845 | Plastome |
| *Populus wenxianica* | MW376846 | Plastome |
| *Populus wilsonii* | NC037223 | Plastome |
| *Populus wulianensis* | NC058847 | Plastome |
| *Populus* x *canadensis* | NC040928 | Plastome |
| *Populus* x *jrtyschensis* | MW376855 | Plastome |
| *Populus xiangchengensis* | NC040953 | Plastome |
| *Populus yatungensis* | MW376856 | Plastome |
| *Populus yunnanensis* | NC037421 | Plastome |
| *Populus yunnanensis* var*. microphylla* | MW376821 | Plastome |
| *Prockia crucis* | MN078147 | Plastome |
| *Prunus yedoensis* | KU985054 | Plastome |
| *Pseudostellaria heterophylla* | MK801111 | Plastome |
| *Quercus acuta* | NC054352 | Plastome |
| *Rhizanthella gardneri* | NC014874 | Plastome |
| *Rhododendron simsii* | NC053764 | Plastome |
| *Ricinus communis* | NC016736 | Plastome |
| *Rourea microphylla* | MT537171 | Plastome |
| *Salacia amplifolia* | NC047214 | Plastome |
| *Salix acutifolia* | MW435413 | Plastome |
| *Salix alba* | MW435415 | Plastome |
| *Salix annulifera* | MZ365447 | Plastome |
| *Salix appendiculata* | MW435416 | Plastome |
| *Salix arbutifolia* | NC036718 | Plastome |
| *Salix argyracea* | NC056250 | Plastome |
| *Salix aurita* | MW435418 | Plastome |
| *Salix babylonica* | NC028350 | Plastome |
| *Salix bicolor* | MW435419 | Plastome |
| *Salix brachista* | NC058984 | Plastome |
| *Salix breviserrata* | MW435421 | Plastome |
| *Salix caprea* | MW435424 | Plastome |
| *Salix chaenomeloides* | NC037422 | Plastome |
| *Salix cheilophila* | NC060294 | Plastome |
| *Salix chienii* | MW969692 | Plastome |
| *Salix cinerea* | MW435426 | Plastome |
| *Salix cupularis* | NC057535 | Plastome |
| *Salix dasyclados* | NC056251 | Plastome |
| *Salix dunnii* | NC058985 | Plastome |
| *Salix elaeagnos* | MW435428 | Plastome |
| *Salix eriocephala* | NC056252 | Plastome |
| *Salix foetida* | MW435429 | Plastome |
| *Salix fragilis* | MW435430 | Plastome |
| *Salix glabra* | MW435431 | Plastome |
| *Salix glaucosericea* | MW435432 | Plastome |
| *Salix gordejevii* | MW562004 | Plastome |
| *Salix gordejevii* | NC058001 | Plastome |
| *Salix gracilistyla* | NC043878 | Plastome |
| *Salix hastata* | MW435433 | Plastome |
| *Salix helvetica* | MW435435 | Plastome |
| *Salix herbacea* | MW435436 | Plastome |
| *Salix hypoleuca* | NC037423 | Plastome |
| *Salix integra* | MT551162 | Plastome |
| *Salix integra* | NC056253 | Plastome |
| *Salix interior* | NC024681 | Plastome |
| *Salix kochiana* | OL339478 | Plastome |
| *Salix koreensis* | OK500208 | Plastome |
| *Salix koriyanagi* | NC044419 | Plastome |
| *Salix lapponum* | MW435437 | Plastome |
| *Salix linearistipularis* | MZ018223 | Plastome |
| *Salix magnifica* | NC037424 | Plastome |
| *Salix maizhokunggarensis* | NC060436 | Plastome |
| *Salix matsudana* | NC059039 | Plastome |
| *Salix matsudana* f*. tortuosa* | MT872638 | Plastome |
| *Salix mielichhoferi* | MW435438 | Plastome |
| *Salix minjiangensis* | NC037425 | Plastome |
| *Salix myrsinifolia* | MW435439 | Plastome |
| *Salix myrtilloides* | MW435441 | Plastome |
| *Salix oreinoma* | NC035743 | Plastome |
| *Salix paraplesia* | NC037426 | Plastome |
| *Salix pentandra* | MW435443 | Plastome |
| *Salix psammophila* | NC051969 | Plastome |
| *Salix purpurea* | NC026722 | Plastome |
| *Salix rehderiana* | NC037427 | Plastome |
| *Salix repens* subsp*. rosmarinifolia* | MW435447 | Plastome |
| *Salix reticulata* | MW435445 | Plastome |
| *Salix retusa* | MW435446 | Plastome |
| *Salix rorida* | NC037428 | Plastome |
| *Salix serpyllifolia* | MW435448 | Plastome |
| *Salix silesiaca* | MW435449 | Plastome |
| *Salix sinopurpurea* | NC054198 | Plastome |
| *Salix sitchensis* | MW435450 | Plastome |
| *Salix spathulifolia* | MZ365445 | Plastome |
| *Salix suchowensis* | NC026462 | Plastome |
| *Salix taoensis* | NC037429 | Plastome |
| *Salix tetrasperma* | NC035744 | Plastome |
| *Salix triandra* | MW435451 | Plastome |
| *Salix triandroides* | NC058986 | Plastome |
| *Salix variegata* | NC057289 | Plastome |
| *Salix viminalis* | MW435452 | Plastome |
| *Salix viminalis* var*. gmelinii* | OK505606 | Plastome |
| *Salix waldsteiniana* | MW435453 | Plastome |
| *Salix wilhelmsiana* | OL405086 | Plastome |
| *Salix wilsonii* | NC053549 | Plastome |
| *Sauropus spatulifolius* | NC058216 | Plastome |
| *Sauvagesia rhodoleuca* | MW772237 | Plastome |
| *Scolopia chinensis* | MN078144 | Plastome |
| *Scolopia saeva* | MN078143 | Plastome |
| *Sedirea japonica* | MN200373 | Plastome |
| *Sinosasa longiligulata* | MF066256 | Plastome |
| *Sloanea cordifolia* | MW242789 | Plastome |
| *Sloanea dasycarpa* | MW242790 | Plastome |
| *Sloanea hemsleyana* | NC058626 | Plastome |
| *Sloanea leptocarpa* | NC058570 | Plastome |
| *Sloanea longiaculeata* | MW242791 | Plastome |
| *Sloanea sinensis* | NC056387 | Plastome |
| *Sobralia callosa* | NC028147 | Plastome |
| *Solanum anguivi* | NC039611 | Plastome |
| *Sonchus arvensis* | NC054161 | Plastome |
| *Spondias dulcis* | NC059000 | Plastome |
| *Styrax japonicus* | NC047429 | Plastome |
| *Testulea gabonensis* | MZ274137 | Plastome |
| *Tetrataenium yunnanense* | NC045183 | Plastome |
| *Thrixspermum japonicum* | NC035831 | Plastome |
| *Torreya nucifera* | MK978775 | Plastome |
| *Triadica sebifera* | MT424756 | Plastome |
| *Tripterygium hypoglaucum* | MZ064576 | Plastome |
| *Tripterygium wilfordii* | OK065822 | Plastome |
| *Vanilla planifolia* | MN200375 | Plastome |
| *Vernicia fordii* | NC034803 | Plastome |
| *Vernicia montana* | NC057051 | Plastome |
| *Vicia sativa* | KJ850242 | Plastome |
| *Xylosma congesta* | MZ379835 | Plastome |
| *Xylosma longifolia* | NC057050 | Plastome |
| *Zelkova serrata* | MT165953 | Plastome |

Supplementary Figures S1-S4.

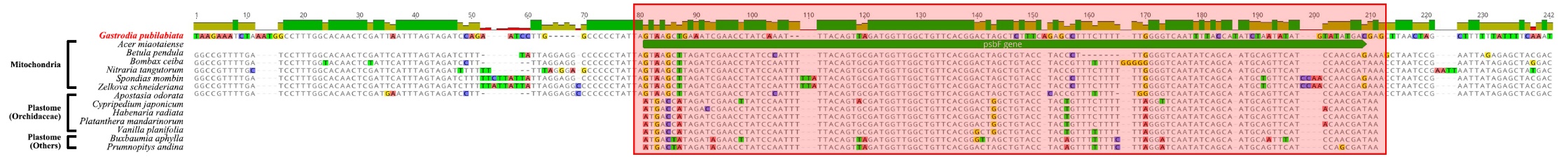


Figure S1. The alignment of mitochondrial *psb*F fragments

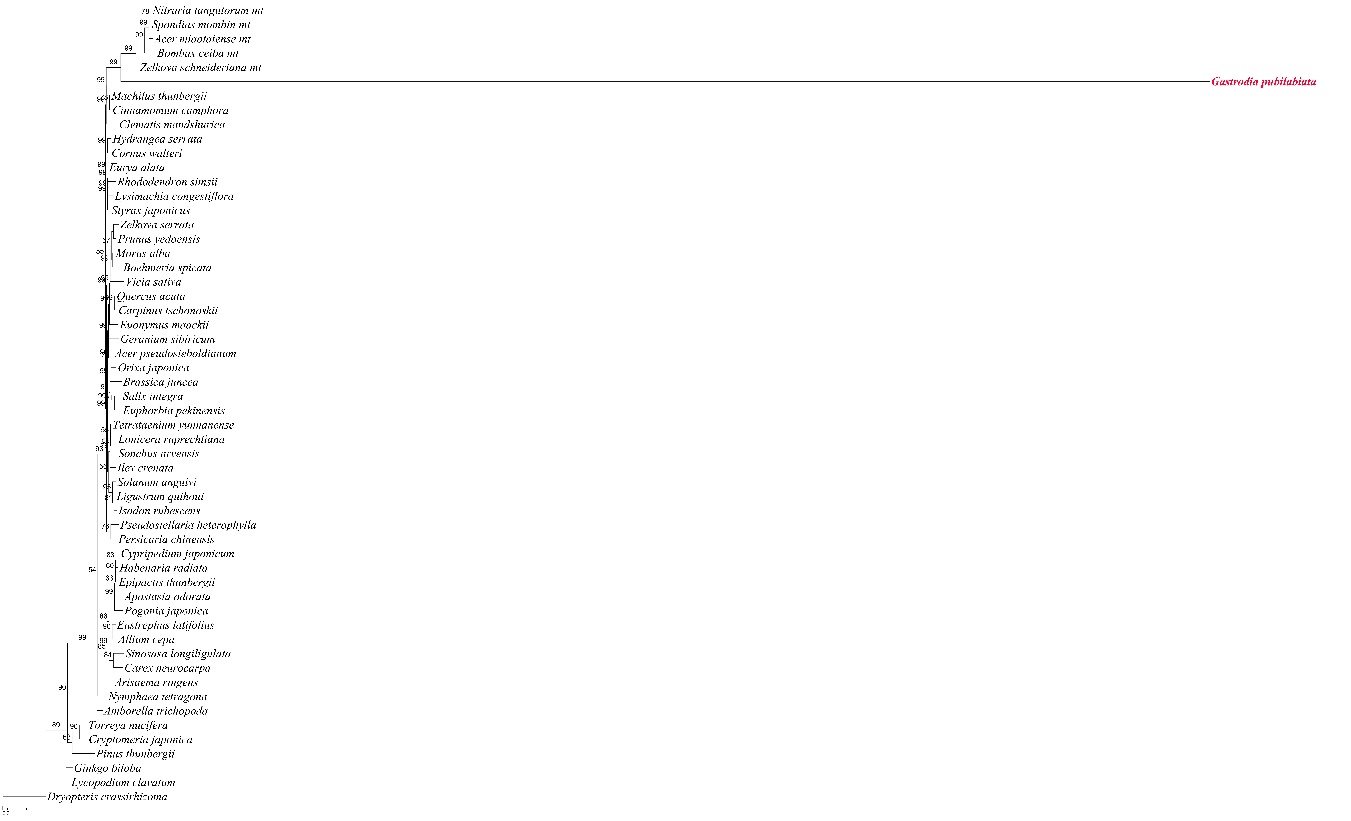


Figure S2. A maximum likelihood (ML) phylogenetic tree of *psb*F fragments with plastome origin *psb*F and mitochondrial *psb*F fragments.

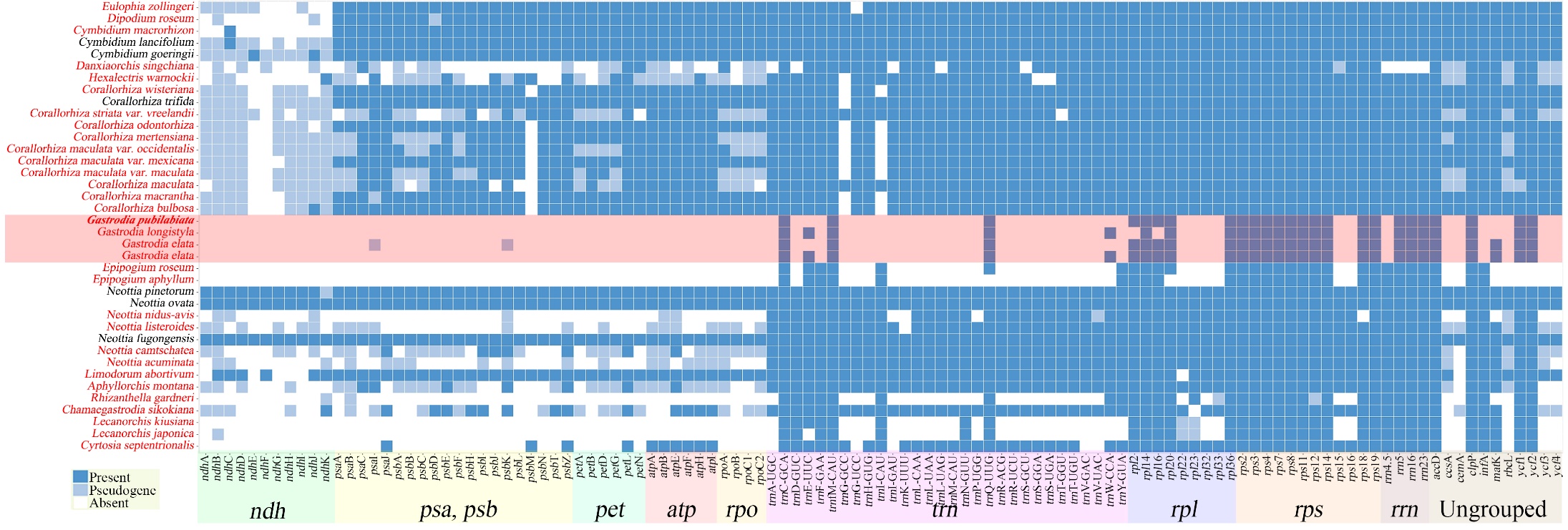


Figure S3. The plastome gene contents heatmap of Orchidaceae. Non-photosynthetic orchids were highlighted with red color.

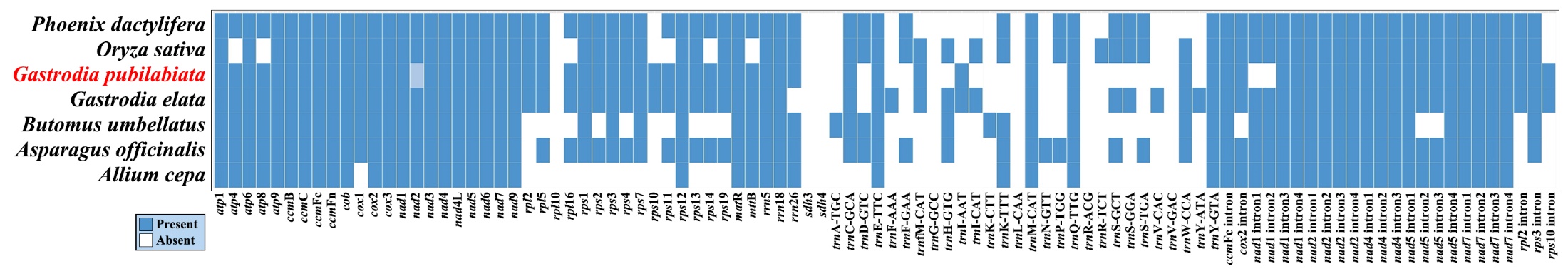


Figure S4. The mitogenome gene contents heatmap of reported monocotyledon mitogenomes including two *Gastrodia* species.