Supplementary Materials: Diversity and Inheritance of Intergenic Spacer Sequences of 45S Ribosomal DNA among Accessions of *Brassica oleracea* L. var. *capitata*

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Figure S1. Cont.
Figure S1. Six different types of IGS sequence as compared using Bio-edit at NCBI. Identical sequences are indicated by a black background, while >50% similarities are indicated by a grey background.

Figure S2. Comparison of the 45S IGS region using mVISTA program: (A) X60324 compared with X56978 showed ~200 bp indel, E compared with F had ~73 bp indel, C compared with E had ~315 bp indel, A, B, and D were more heterogeneous; (B) phylogenetic tree. The reliability value for each internal branch indicates in percent how often the corresponding cluster was found among 1000 intermediate trees.
Figure S3. Dot matrix self-comparison plot of the *B. oleracea* var. *capitata* IGS sequences. A diagrammatic representation of the intergenic spacer is shown above the plot. IGS-A and IGS-B did not show repeat region; C–F had from one to six tandem repeat sequences. X56978 and X60324 are two reference sequences available in NCBI.
**Table S1.** Whole-genome sequencing for 5S and 45S rDNA annotation.

| Inbred Line Name | Read Count   | Total Bases (bp) | Coverage |
|------------------|--------------|------------------|----------|
| Asiaseed-14      | 38,709,840   | 3,909,693,840    | 6.2x     |
| Asiaseed-17      | 36,389,648   | 3,675,354,448    | 5.8x     |
| Asiaseed-28      | 41,360,398   | 4,177,400,198    | 6.6x     |
| Asiaseed-31      | 37,437,444   | 3,781,181,844    | 6.0x     |

**Table S2.** Comparison of different rDNA sub-units between *S. alba* 5S [Acc. No. X56866 (Capesius 1991a)] and 45S [X66325 (Capesius 1991b)] with those of *B. oleracea* (next-generation sequencing data of the present study).

| Genes       | Gene Size (bp) | GC Contents (%) | Gene Size (bp) | GC Contents (%) | Difference Count (bp) |
|-------------|----------------|-----------------|----------------|-----------------|-----------------------|
| 5S          | 118            | 57.63           | 118            | 57.63           | 0                     |
| 5S-IGS      | 373            | 40.48           | 385            | 42.60           | 122                   |
| 45S-18S     | 1804           | 49.00           | 1807           | 49.31           | 23                    |
| 45S-ITS1    | 265            | 50.57           | 257            | 51.75           | 35                    |
| 45S-5.8S    | 163            | 52.76           | 164            | 53.66           | 4                     |
| 45S-ITS2    | 188            | 54.79           | 187            | 54.55           | 18                    |
| 45S-25S     | 3381           | 55.19           | 3388           | 55.40           | 60                    |

**Table S3.** Sub-repeat traits of 45S IGS in *B. oleracea* var. capitata.

| Indices     | Period Size | Copy Number | Consensus Size | Percent Matches | Percent Indels | Score | A  | C  | G  | T  | Entropy (0-2) |
|-------------|-------------|-------------|----------------|-----------------|----------------|-------|----|----|----|----|----------------|
|             | (a) C Type  |             |                |                 |                |       |    |    |    |    |                |
| 304–522     | 72          | 3.0         | 72             | 90              | 2              | 350   | 25 | 27 | 29 | 17 | 1.97           |
| 483–544     | 30          | 2.1         | 30             | 96              | 3              | 117   | 27 | 33 | 25 | 12 | 1.93           |
| 523–608     | 21          | 4.0         | 22             | 95              | 3              | 149   | 26 | 33 | 25 | 13 | 1.94           |
| 532–625     | 42          | 2.2         | 41             | 85              | 7              | 118   | 31 | 36 | 20 | 11 | 1.88           |
| 1090–1132   | 12          | 3.6         | 12             | 93              | 0              | 77    | 6  | 27 | 27 | 37 | 1.83           |
|             | (b) D Type  |             |                |                 |                |       |    |    |    |    |                |
| 395–590     | 58          | 3.4         | 58             | 97              | 0              | 356   | 27 | 20 | 30 | 20 | 1.98           |
| 557–696     | 44          | 3.1         | 44             | 78              | 6              | 172   | 26 | 20 | 32 | 20 | 1.97           |
| 858–902     | 20          | 2.4         | 19             | 85              | 14             | 58    | 44 | 33 | 15 | 6  | 1.73           |
|             | (c) E Type  |             |                |                 |                |       |    |    |    |    |                |
| 626–696     | 30          | 2.4         | 30             | 90              | 0              | 115   | 28 | 32 | 23 | 15 | 1.95           |
| 656–830     | 72          | 2.4         | 72             | 90              | 2              | 280   | 26 | 27 | 28 | 17 | 1.97           |
| 802–863     | 30          | 2.1         | 30             | 96              | 3              | 117   | 27 | 33 | 25 | 12 | 1.93           |
| 842–927     | 21          | 4.0         | 22             | 95              | 3              | 149   | 26 | 33 | 25 | 13 | 1.94           |
| 851–940     | 42          | 2.1         | 41             | 84              | 8              | 110   | 32 | 34 | 21 | 12 | 1.90           |
| 1409–1451   | 12          | 3.6         | 12             | 93              | 0              | 77    | 6  | 27 | 27 | 37 | 1.83           |
Table S3. Cont.

(d) F Type

| Indices   | Period | Copy Number | Consensus Size | Percent Matches | Percent Indels | Score | A | C | G | T | Entropy (0-2) |
|-----------|--------|-------------|----------------|-----------------|----------------|-------|---|---|---|---|--------------|
| 627–697   | 30     | 2.4         | 30             | 90              | 0              | 115   | 28| 32| 23| 15| 1.95         |
| 657–916   | 74     | 3.6         | 74             | 93              | 2              | 445   | 26| 28| 29| 15| 1.96         |
| 877–938   | 30     | 2.1         | 30             | 96              | 3              | 117   | 27| 33| 25| 12| 1.93         |
| 917–1002  | 21     | 4.0         | 22             | 95              | 3              | 149   | 26| 33| 25| 13| 1.94         |
| 926–1016  | 42     | 2.2         | 41             | 84              | 7              | 112   | 32| 34| 20| 12| 1.90         |
| 1484–1526 | 12     | 3.6         | 12             | 93              | 0              | 77    | 6 | 27| 27| 37| 1.83         |

(e) Accession X56978

| Indices   | Period | Copy Number | Consensus Size | Percent Matches | Percent Indels | Score | A | C | G | T | Entropy (0-2) |
|-----------|--------|-------------|----------------|-----------------|----------------|-------|---|---|---|---|--------------|
| 510–796   | 71     | 4.0         | 72             | 76              | 8              | 303   | 26| 26| 27| 19| 1.99         |
| 767–867   | 30     | 3.4         | 30             | 90              | 0              | 166   | 27| 31| 24| 15| 1.96         |
| 703–1064  | 134    | 2.7         | 134            | 94              | 1              | 640   | 25| 28| 29| 16| 1.96         |
| 901–1001  | 30     | 3.4         | 30             | 95              | 0              | 184   | 27| 32| 25| 13| 1.94         |
| 827–1279  | 205    | 2.2         | 205            | 95              | 2              | 818   | 26| 29| 28| 15| 1.96         |
| 961–1146  | 71     | 2.5         | 72             | 93              | 5              | 320   | 25| 29| 30| 15| 1.95         |
| 1106–1199 | 30     | 3.1         | 30             | 96              | 0              | 179   | 27| 32| 26| 12| 1.93         |
| 1239–1309 | 30     | 2.4         | 30             | 92              | 0              | 115   | 23| 32| 26| 16| 1.96         |
| 1269–1527 | 72     | 3.5         | 73             | 93              | 2              | 423   | 25| 27| 31| 16| 1.96         |
| 1166–1703 | 248    | 2.2         | 250            | 95              | 2              | 994   | 24| 28| 30| 16| 1.97         |
| 1487–1557 | 30     | 2.4         | 30             | 92              | 0              | 115   | 23| 32| 26| 16| 1.96         |
| 1517–1981 | 72     | 6.5         | 72             | 74              | 9              | 436   | 25| 27| 29| 17| 1.97         |
| 1663–1763 | 30     | 3.4         | 30             | 95              | 0              | 184   | 27| 32| 25| 13| 1.94         |
| 1487–1898 | 206    | 2.0         | 206            | 92              | 1              | 684   | 25| 28| 28| 17| 1.97         |
| 663–1970  | 454    | 2.8         | 454            | 68              | 21             | 550   | 25| 27| 29| 16| 1.97         |
| 1941–2011 | 30     | 2.4         | 30             | 95              | 0              | 124   | 25| 32| 26| 15| 1.95         |
| 1166–2319 | 176    | 6.6         | 176            | 78              | 9              | 962   | 25| 27| 29| 16| 1.97         |
| 1971–2154 | 68     | 2.5         | 73             | 84              | 11             | 252   | 26| 29| 27| 16| 1.97         |
| 2114–2184 | 30     | 2.4         | 30             | 92              | 0              | 115   | 28| 33| 23| 14| 1.94         |
| 2048–2256 | 104    | 2.1         | 98             | 85              | 7              | 278   | 25| 29| 26| 17| 1.98         |
| 2144–2402 | 72     | 3.6         | 74             | 86              | 3              | 366   | 26| 27| 28| 17| 1.97         |
| 1978–2424 | 248    | 1.8         | 247            | 90              | 3              | 720   | 26| 28| 28| 17| 1.97         |
| 2362–2424 | 30     | 2.1         | 30             | 96              | 0              | 117   | 26| 31| 26| 14| 1.95         |
| 2409–2463 | 19     | 2.8         | 20             | 88              | 2              | 85    | 34| 32| 18| 14| 1.91         |
| 2432–2492 | 19     | 3.2         | 19             | 82              | 11             | 63    | 44| 32| 14| 8 | 1.75         |
| 2944–2984 | 12     | 3.4         | 12             | 96              | 0              | 73    | 7 | 31| 26| 34| 1.84         |
Table S3. Cont.

| Indices     | Period | Copy Number | Consensus Size | Percent Matches | Percent Indels | Score | A    | C    | G    | T    | Entropy (0-2) |
|-------------|--------|-------------|----------------|----------------|----------------|-------|------|------|------|------|----------------|
| 512–1345    | 72     | 12.0        | 72             | 67             | 13             | 328   | 26   | 28   | 28   | 16   | 1.97           |
| 770–870     | 30     | 3.4         | 30             | 90             | 0              | 166   | 27   | 31   | 24   | 15   | 1.96           |
| 904–1004    | 30     | 3.4         | 30             | 97             | 0              | 193   | 27   | 33   | 25   | 12   | 1.93           |
| 1110–1210   | 30     | 3.4         | 30             | 97             | 0              | 193   | 27   | 33   | 25   | 12   | 1.93           |
| 1170–1355   | 30     | 3.4         | 30             | 95             | 4              | 351   | 25   | 29   | 30   | 14   | 1.95           |
| 1315–1415   | 30     | 3.4         | 30             | 95             | 0              | 184   | 27   | 32   | 25   | 13   | 1.94           |
| 830–1489    | 205    | 3.2         | 208            | 97             | 1              | 1249  | 26   | 29   | 29   | 15   | 1.96           |
| 934–1591    | 104    | 6.4         | 104            | 72             | 14             | 592   | 26   | 29   | 29   | 15   | 1.96           |
| 1449–1519   | 30     | 2.4         | 30             | 92             | 0              | 115   | 23   | 32   | 26   | 16   | 1.96           |
| 1479–1737   | 72     | 3.5         | 73             | 93             | 2              | 432   | 24   | 27   | 31   | 16   | 1.96           |
| 1375–2532   | 176    | 6.6         | 176            | 80             | 8              | 1039  | 25   | 27   | 29   | 16   | 1.97           |
| 1375–1913   | 248    | 2.2         | 250            | 97             | 1              | 1028  | 25   | 27   | 30   | 16   | 1.97           |
| 1697–1767   | 30     | 2.4         | 30             | 92             | 0              | 115   | 23   | 32   | 26   | 16   | 1.96           |
| 1727–2191   | 72     | 6.5         | 72             | 75             | 9              | 445   | 25   | 27   | 29   | 17   | 1.97           |
| 1873–1973   | 30     | 3.4         | 30             | 95             | 0              | 184   | 27   | 32   | 25   | 13   | 1.94           |
| 1697–2108   | 206    | 2.0         | 206            | 92             | 1              | 693   | 25   | 28   | 28   | 17   | 1.97           |
| 2151–2221   | 30     | 2.4         | 30             | 95             | 0              | 124   | 25   | 32   | 26   | 15   | 1.95           |
| 2079–2293   | 104    | 2.1         | 101            | 92             | 3              | 351   | 26   | 27   | 29   | 16   | 1.97           |
| 2181–2367   | 72     | 2.6         | 74             | 90             | 3              | 306   | 26   | 28   | 28   | 16   | 1.96           |
| 1901–2637   | 248    | 3.0         | 244            | 86             | 4              | 865   | 26   | 27   | 29   | 17   | 1.97           |
| 2327–2397   | 30     | 2.4         | 30             | 92             | 0              | 115   | 28   | 33   | 23   | 14   | 1.94           |
| 2255–2469   | 104    | 2.1         | 103            | 87             | 5              | 303   | 26   | 28   | 27   | 17   | 1.97           |
| 2357–2615   | 72     | 3.6         | 74             | 86             | 3              | 375   | 26   | 27   | 29   | 17   | 1.97           |
| 2575–2637   | 30     | 2.1         | 30             | 96             | 0              | 117   | 26   | 31   | 26   | 14   | 1.95           |
| 2616–2679   | 21     | 3.0         | 21             | 93             | 2              | 110   | 28   | 31   | 25   | 15   | 1.96           |
| 3160–3200   | 12     | 3.4         | 12             | 96             | 0              | 73    | 7    | 31   | 26   | 34   | 1.84           |