Table S1 Summary statistics for components of plant height and flowering for the *S. bicolor* BTx623× IS3620C RIL population and parents.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | RIL | | | | | | | BTx 623 | | | | | IS3620C | | | | |
| Trait | N | Mean | Std | Min | | Max | Broad Sense  Heritability (%) | N | Mean | Std | Min | Max | N | Mean | Std | Min | Max |
| PH\* | 1523 | 98.62 | 24.0256 | | 43.0 | 193.0 | 78.63 | 28 | 94.40 | 8.2106 | 74.8 | 111.4 | 29 | 84.49 | 9.4353 | 67.6 | 103.5 |
| BTF | 1509 | 72.12 | 23.5039 | | 13.7 | 54.7 | 79.71 | 28 | 69.41 | 7.9703 | 49.2 | 86.3 | 28 | 64.86 | 9.4520 | 40.5 | 80.7 |
| FTR | 1509 | -2.60 | 9.2664 | | -55.1 | 31.7 | 68.24 | 28 | -3.68 | 5.4898 | -14.5 | 9.7 | 28 | -13.68 | 6.1065 | -20.5 | 5.9 |
| ND | 1515 | 9.16 | 1.8573 | | 4.0 | 16.0 | 73.61 | 28 | 11.75 | 1.3229 | 8.0 | 14.0 | 29 | 7.72 | 1.3065 | 6.0 | 10.0 |
| FL | 776 | 59.01 | 9.2530 | | 40.8 | 99.2 | 83.65 | 26 | 72.11 | 5.3668 | 63.4 | 80.0 | 15 | 58.35 | 6.1307 | 49.4 | 66.6 |

\*PH: plant height

BTF: base to flag length

FTR: flag to rachis length

ND: number of nodes

FL: days to flowering

Table S2 Correlation coefficients among five traits in the *S. bicolor* BTx623× IS3620C RILs.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Plant height | Base to flag length | Flag to rachis length | Number of nodes | Days to flower |
| Plant height | - | 0.8983 \*\*\*(1508)\* | 0.0778  \*\* (1508) | 0.2255  \*\*\*(1514) | -0.0360  (770) |
| Base to flag length |  | - | -0.2459  \*\*\* (1508) | 0.3331  \*\*\* (1500) | 0.0038  (770) |
| Flag to rachis length |  |  | - | -0.3228  \*\*\* (1500) | -0.0795  \*(770) |
| Number of nodes |  |  |  | - | 0.5806  \*\*\*(770) |
| Days to flower |  |  |  |  | - |

\*Numbers in parenthesis are sample sizes.

Table S3 QTL mapping of plant height, base to flag length, flag to rachis length, number of nodes and days to flowering in the *bicolor* BTx623× IS3620C RILs.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Peak (cM) | Peak (Mb) | LOD | % Var Explained | Additive \* Effect | One-LOD interval (cM) | Flanking SNP Physical positions (Mb) | | QTLs found in other studies | GWAS studies |
| Plant height (**PH**) | | | | | | |  |  |  |  |
| qPH2.1 | 121.8 | 65.5 | 3.1 | 2.20 | 2.37 | 114-133 | 63.7 | 68.8 | Shiringani,2008; | - |
| qPH3.1 | 19.0 | 3.8-4.0 | 4.4 | 3.19 | -2.86 | 15-30 | 3.2 | 5.6 | Hart,2001; Brown, 2006 | - |
| qPH6.1 | 21.0 | 42.4 | 22.1 | 17.68 | -6.83 | 19-24 | 39.6 | 44.9 | Kebede,2001; Brown, 2006; Srinivas, 2009 | Zhang,2015; Morris,2013 |
| qPH7.1 | 89.0 | 58.4 | 14.5 | 11.12 | 5.22 | 88-91 | 57.7 | 59.5 | Hart,2001; Srinivas,2009 | Zhang,2015; Morris, 2013 |
| qPH8.1 | 69.0 | 50.2 | 3.1 | 2.21 | 2.53 | 62-75 | 47.5 | 51.8 | Shiringani,2008; |  |
| qPH9.1 | 93.0 | 52.6 | 3.3 | 2.35 | 2.36 | 91-101 | 52.0 | 55.8 | Lin, 1995; | Zhang,2015; Morris, 2013 |
| qPH10.1 | 55.0 | 12.3 | 4.3 | 3.06 | -2.87 | 46-70 | 8.1 | 52.2 | Hart,2001; | - |
| Full model |  |  |  | **40.13** |  |  |  |  |  |  |
| Base to flag length (**BTF**) | | | |  |  |  |  |  |  |  |
| qBTF3.1 | 19.6 | 3.8-4.0 | 4.6 | 3.07 | -2.75 | 17-25 | 3.2 | 4.9 | NA | - |
| qBTF4.1 | 124.4 | 60.5 | 3.1 | 2.03 | -2.09 | 117-133 | 58.9 | 61.9 | NA | - |
| qBTF5.1 | 30.6 | 4.8 | 3.6 | 2.36 | 2.43 | 25-40 | 1.5 | 7.4 | NA | - |
| qBTF6.1 | 23.0 | 44.7 | 22.8 | 16.92 | -6.68 | 19-26 | 39.6 | 45.5 | NA | Zhang, 2015 |
| qBTF7.1 | 88.9 | 58.4 | 32.5 | 25.65 | 8.17 | 87-90 | 57.7 | 59.5 | NA | Zhang, 2015 |
| Full model |  |  |  | **41.58** |  |  |  |  |  |  |
| Flag to rachis length (**FTR**) | | | |  |  |  |  |  |  |  |
| qFTR1.1 | 18.5 | 5.8 | 5.2 | 4.50 | 1.17 | 12-27 | 1.9 | 8.1 | NA |  |
| qFTR3.1 | 106.0 | 59.3 | 11.3 | 10.14 | -1.51 | 104-115 | 58.9 | 63.0 | NA |  |
| qFTR7.1 | 88.0 | 58.4 | 7.1 | 6.23 | -1.19 | 83-93 | 57.7 | 59.5 | NA |  |
| qFTR8.1 | 15.0 | 2.7 | 4.6 | 3.96 | 0.95 | 10-20 | 2.4 | 4.3 | NA |  |
| qFTR10.1 | 46.8 | 8.1 | 8.8 | 7.79 | -1.32 | 44-50 | 6.7 | 9.9 | NA |  |
| Full model |  |  |  | **28.21** |  |  |  |  |  |  |
| Number of nodes (**ND**) | |  |  |  |  |  |  |  |  |  |
| qND1.1 | 69.0 | 23.1 | 5.6 | 4.65 | 0.30 | 66-75 | 21.3 | 45.3 | NA | - |
| qND1.2 | 126.0 | 57.6 | 5.2 | 4.31 | -0.22 | 123-131 | 57.6 | 59.4 | NA | Zhang,2015 |
| qND3.1 | 115.0 | 62.5 | 4.9 | 3.98 | -0.22 | 108-121 | 59.3 | 64.9 | NA | - |
| qND6.1 | 83.0 | 56.6 | 4.6 | 3.76 | -0.21 | 48-93 | 48.9 | 59.0 | NA | Zhang,2015 |
| qND8.1 | 80.0 | 51.8 | 13.0 | 11.15 | -0.36 | 78-84 | 50.2 | 52.4 | NA | - |
| qND10.1 | 14.0 | 2.8 | 4.1 | 3.35 | 0.20 | 7-39 | 2.1 | 7.3 | NA | Zhang,2015 |
| Full model |  |  |  | **32.07** |  |  |  |  |  |  |
| Days to flowering (**FL**) | |  |  |  |  |  |  |  |  |  |
| qFL1.1 | 70.0 | 23.1 | 9.6 | 6.37 | 1.56 | 68-73 | 22.0 | 26.2 | - | - |
| qFL1.2 | 128.0 | 58.2 | 8.1 | 5.35 | -1.13 | 120-130 | 55.7 | 59.4 | Ritter,2008; Yang,2014 | - |
| qFL3.1 | 116.6 | 62.5 | 8.9 | 5.88 | -1.15 | 108-118 | 59.3 | 63.4 | Shiringani,2010 | Zhang, 2015 |
| qFL4.1 | 151.0 | 64.5 | 5.4 | 3.51 | 0.92 | 148-156 | 63.7 | 65.8 | - | - |
| qFL6.1 | 81.0 | 56.0 | 4.2 | 2.71 | -0.78 | 77-85 | 55.5 | 57.9 | Shiringani,2010 | - |
| qFL8.1 | 31.0 | 4.3 | 4.4 | 2.86 | -0.79 | 27-36 | 2.7 | 6.2 | - | - |
| qFL8.2 | 84.6 | 52.4 | 16.1 | 11.16 | -1.70 | 83.3-86 | 52.3 | 52.8 | Brown,2006, Kong 2013 | - |
| qFL9.1 | 122.4 | 59.3 | 11.4 | 7.69 | 1.37 | 120-122.4 | 56.1 | 59.5 | Hart, 2001; Lin, 1995; Kong, 2013 | Zhang, 2015 |
| qFL10.1 | 91.0 | 55.9 | 5.5 | 3.60 | 0.89 | 87-95.2 | 55.2 | 56.5 | Hart,2001; | - |
| Full model |  |  |  | **46.33** |  |  |  |  |  |  |

\*A positive additive effect indicates that alleles from *S. bicolor* IS3620C increase the trait