**Table S1.** **Summary of powdery mildew resistance genes in melon**

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Sources of resistance | Physiological race | Position |
| *Pm-1* | PMR 45, PMR 5 | Race 1 | LGIX |
| *Pm-2* | PMR 5 | Race 1, 2 | - |
| *Pm-3* | PI 124112 | Race 1, 2 | - |
| *Pm-4*  *(Pm V.1)*  *(Pm-F)* | PI 124112 | Race 1, 2, 3 | LGIV |
| *Pm-5*  *(Pm XII.1)*  *(Pm-G)* | PI 124112 | Race 1, 2, 5 | LGXII |
| *Pm-x* | PI 414723 | Race 1, 2 | LGII |
| *Pm-w*  *(Pm-B)* | WMR 29 | Race 1, 2, 3 | - |
| *Pm-Edisto47-1* | Edisto 47 | Race 1 | Chr 2 |
| *Pm-Edisto47-2* | Edisto 47 | Race 1 | Chr 5 |
| *BPm12.1* | MR-1 | Race 1 | Chr 12 |
| *Pm-S* | PI 313970 | Race S | - |
| *Pm-8* | PI 134198 | Race pxCh1 | - |
| *Pm-6* | PI 124112 | Race 2 | - |

**Table S2.** **The primers of CAPS markers for QTL analysis and fine mapping of *CmPMRl***

|  |  |  |  |
| --- | --- | --- | --- |
| Marker name | Sequencing of primers | Restrictionenzyme | Position(Mb) |
| *PM12-V1.* | F：ATCCTTAGGGAGTTGTAGTTG  R：GGCTGAGCACAGATAGTT | *Eco*RI | Chr12：20095829 |
| *PM12-V2* | F：GGCTGAGCACAGATAGTT  R：TCAAGGCGAAGATATTGAGCAA | *Msp*I | Chr12：20685423 |
| *PM12-V3* | F：GGCTGAGCACAGATAGTT  R：GCTTCTCCAGTATGTAATCC | *Msp*I | Chr12：21022163 |
| *PM12-V4* | F：GGTACGACCTATCCAATAAGT  R：TACTCACAGTTGAGGCATAA | *Hind*Ⅲ | Chr12：21594445 |
| *PM12-V5* | F：ACGAAGAGATAGCAACTCAA  R：CACTACCCTACAATAAGACAAC | *Hind*Ⅲ | Chr12：22030463 |
| *PM12-V6* | F：CTACTAACACTACCATCCAATC  R：CCTCTCCACTACGACACA | *Bam*HI | Chr12：22272017 |
| *PM12-V7* | F：ACATTGGAAGTTAGGAGGTT  R：GAGAAGAAGAAGAAGAAGAAGG | *EcoR*I | Chr12：22729051 |
| *PM12-V8* | F：AACACCTTGAACAAGTATGC  R：CGCTATGCCGAACAAGAT | *EcoR*I | Chr12：22917727 |
| *PM12-V9* | F：TGGATGGACATCTCTTGGA  R：GGCTTGCTTGACTACTGAA | *Taq*I | Chr12：23070762 |
| *PM12-V10* | F：AATGTTGGTAGGCATCGAA  R：AAATGTGTGGTACAGACTCA | *Hind*Ⅲ | Chr12：23304817 |
| *PM12-V11* | F：AACCTTACCACACCAATCTT  R：CCACTCCTCTAATAACATCAAC | *Taq*I | Chr12：23820847 |
| *PM12-V12* | F：CACACCACTACATCACAAC  R：GCACTCAAGCATTAGATACC | *Eco*RI | Chr12：24328133 |
| *PM12-V13* | F：TTGTTTCCTCGTTCGTCTT  R：TTCTGCCTCCTGTCTTCA | *Hind*Ⅲ | Chr12：25007067 |
| *PM12R-1* | F：GGTACGACCTATCCAATAAGT  R：TACTCACAGTTGAGGCATAA | *Hind*Ⅲ | Chr12：21594445 |
| *PM12R-2* | F：ACGAAGAGATAGCAACTCAA  R：CACTACCCTACAATAAGACAAC | *Hind*Ⅲ | Chr12：22030463 |
| *PM12R-3* | F：CTACTAACACTACCATCCAATC  R：CCTCTCCACTACGACACA | *Bam*HI | Chr12：22272017 |
| *PM12R-4* | F：ACATTGGAAGTTAGGAGGTT  R：GAGAAGAAGAAGAAGAAGAAGG | *Msp*I | Chr12：22729051 |
| *PM12R-5* | F：GCCAACTAAGAGAATGTTCA  R：AATGCTGGAGATGCTGTC | *Taq*I | Chr12：22781221 |
| *PM12R-6* | F：TATACCTCATCATCTCACTCC  R：TGGTCGGTGTTGATACTAC | *Kpn*I | Chr12：22822640 |
| *PM12R-7* | F：AACACCTTGAACAAGTATGC  R：CGCTATGCCGAACAAGAT | *Hind*Ⅲ | Chr12：22917727 |
| *PM12R-8* | F：TGGATTACCTTAGTCGTCTC  R：CCAGCTAGTGTGATGAGTTA | *Eco*RI | Chr12：23007377 |
| *PM12R-9* | F：TGGATGGACATCTCTTGGA  R：GGCTTGCTTGACTACTGAA | *Taq*I | Chr12：23070762 |
| *PM12R-10* | F：GTGTATCTAGGTTATTGGAGTG  R：CCAGCTAGTGTGATGAGTTA | *Msp*I | Chr12：23122133 |
| *PM12R-11* | F：GGATTGGTGTGATTAAGTGT  R：CCTTGTTCCGATTGATATGT | *Eco*RI | Chr12：23205471 |
| *PM12R-12* | F：CCATCTCTTCCTGTGTCAA  R：TTAATAGGTGGCTACTCTCG | *Mbo*I | Chr12：23250741 |
| *PM12R-AD1* | F：TTCAAGTGCTCGTGACTC  R：CTTCATACATCCTCCGCATA | *Taq*I | Chr12：22786222 |
| *PM12R-AD2* | F：GTCTCGCTTAATTGAACACT  R：GAGTCTTCCTAATAATCTCTGG | *Sca*I | Chr12：22803656 |
| *PM12R-AD3* | F：GGCAGTTGATTAGTTGAGTC  R：CTGAGGCAAGTTCATCGT | *Xho*I | Chr12：22818381 |
| *PM12R-AD4* | F：ACTGTAGTGTAGTTGGAAGT  R：CTCTAGGTGCGATGGTTC | *Msp*I | Chr12：22836405 |
| *PM12R-AD5* | F：ATTGGCATTGGCAAGTTG  R：GTCATAATCTCTCCCTCAAAC | *Eco*RI | Chr12：22863139 |
| *PM12R-AD6* | F：CCATCCTGTTCAACACCAT  R：GAATAAGAAGATCCAACCTGTG | *Msp*I | Chr12：22897445 |

**Table S3.** **Posterity separation ratio of F3 used for *CmPMrs* fine-mapping**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No. | Number of F3 with stem resistance | Number of F3 with stem susceptible | Excepted ratio | χ2 | P Value |
| F2-288 | 7 | 23 | 1:3 | 0.044 | 0.833 |
| F2-357 | 8 | 22 | 1:3 | 0.044 | 0.833 |
| F2-560 | 7 | 23 | 1:3 | 0.044 | 0.833 |
| F2-903 | 9 | 21 | 1:3 | 0.4 | 0.527 |

**Table S4.** **The primers of CAPS markers for QTL analysis and fine mapping of *CmPMrs***

|  |  |  |  |
| --- | --- | --- | --- |
| Marker name | Sequencing of primers | Restrictionenzyme | Position(Mb) |
| *PM10-V1.* | F：CGTGGTTCTGAGGACTAAG  R：TCTTGAGGGCGTTTGATG | *Pst*I | Chr10：31136 |
| *PM10-V2*  *(PM10M-1）* | F：TCATTCCGTAACTCCGTAAT  R：TGCCAGAATTGCCTTCC | *Pst*I | Chr10：109367 |
| *PM10-V3*  *(PM10m-3)* | F：TTCCCATCGCTCAAAGG  R：GATACCTAGTGTAAGATCCTAC | *Hind*Ⅲ | Chr10：357904 |
| *PM10-V4* | F：GTATGTCCTCCTCTTCTCAA  R：AGTCAGTCAATGTCACCAA | *Pst*I | Chr10：504559 |
| *PM10-V5*  *(PM10m-6)* | F：TATCCGATTGTTATGTTGGC  R：CGAAGAAGGTGAGCAGTAA | *Bam*HI | Chr10：745867 |
| *PM10-V6*  *(PM10m-8)* | F：TCGCCTTGTTCTCCTCTAA  R：CTTCAACAGTAACGATTCTAGG | *Pst*I | Chr10：1078973 |
| *PM10-V7*  *(PM10m-10)* | F：GTATGTCCTCCTCTTCTCAA  R：AGTCAGTCAATGTCACCAA | *Bam*HI | Chr10：1453894 |
| *PM10-V8*  *(PM10m-12)* | F：CTTGAGTCATGGTCCTTCC  R：ATGGCACTACACATTCTGAA | *Bam*HI | Chr10：2048991 |
| *PM10-V9* | F：CTCCAGTTATTCCAAGCATAAG  R：CGTCATCTACACAGGTTCAT | *Eco*RI | Chr10：2108889 |
| *PM10-V10* | F：TGATTCATCAGGCAGAACA  R：CCTTACAACAACAGACAACA | *Msp*I | Chr10：2198285 |
| *PM10-V11* | F：GACGAGGTTCTACAGTTATTG  R：GTATGCCAGGAAGTGCTAA | *Msp*I | Chr10：2362896 |
| *PM10-V12* | F：GGTAAGGAATGGATGGAACT  R：TGGAATCTCGCACTTCTATT | *Pst*I | Chr10：2500432 |
| *PM10m-2* | F：GGAAGTGAAGAAGGAAGGAA  R：CCCACGTTGAGTACATTTAC | *Pst*I | Chr10：265965 |
| *PM10m-4* | F：TGGTTGAGAGCTTCATAGAT  R：CCAAATGATTAGGTGTAGATGG | *Pst*I | Chr10：466642 |
| *PM10m-5* | F：CAATCCTGGCATACATTATCC  R：CACTGTCACTATGGCTCAC | *Msp*I | Chr10：597508 |
| *PM10m-7* | F：GGACTACTTCTCATAGACAGA  R：GGTGCTTGTATGTAAGATGT | *Pst*I | Chr10：910860 |
| *PM10m-9* | F：GGAGATGGAGCAGAAGTT  R：ACTGTCTACCACAATACAAC | *Hind*Ⅲ | Chr10：1336583 |
| *PM10m-11* | F：ACGCTCAAGAATCCTCATC  R：TCATCTGCCTCCTTCATTG | *Hind*Ⅲ | Chr10：1722553 |
| *PM10m-AD1* | F：TGGTTGAGAGCTTCATAGAT  R：CCAAATGATTAGGTGTAGATGG | *Kpn*I | Chr10：487899 |
| *PM10m-AD2* | F：GCTTAACAATACGAGGTCTT  R：AGAGGAATCTCATCATCTCC | *Pst*I | Chr10：504559 |
| *PM10m-AD3* | F：AAGCAGTCAAGCACCAAT  R：TCGGGTTTCCACATAATTTG | *Bcl*I | Chr10：534167 |
| *PM10m-AD4* | F：CAATCCTGGCATACATTATCC  R：CACTGTCACTATGGCTCAC | *Pst*I | Chr10：552080 |

**Table S5. Genotyping result for *CmPMRl* fine-mapping by recombinant individual**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Number | Phenotype | *PM12R-1* | *PM12R-2* | *PM12R-3* | *PM12R-4* | *PM12R-5* | PM12R-AD1 | PM12R-AD2 | PM12R-AD3 | *PM12R-6* | PM12R-AD4 | PM12R-AD5 | PM12R-AD6 | *PM12R-7* | *PM12R-8* | *PM12R-9* | *PM12R-10* | *PM12R-11* | *PM12R-12* |
| F2-395 | S | H | H | H | H | H | H | B | B | B | B | B | B | B | B | B | B | B | B |
| F2-897 | S | H | H | H | H | H | H | B | B | B | B | B | B | B | B | B | B | B | B |
| F2-278 | R | H | H | H | H | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| F2-104 | S | H | H | H | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| F2-963 | S | H | H | H | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| F2-455 | S | H | H | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| F2-506 | S | H | H | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| F2-597 | S | H | H | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| F2-133 | S | H | H | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| F2-95 | S | H | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| F2-702 | R | B | H | H | H | H | B | B | B | H | B | B | B | H | H | H | H | H | H |
| F2-1002 | S | B | B | B | B | B | B | B | B | B | H | H | H | H | H | H | H | H | H |
| F2-288 | S | B | B | B | B | B | B | B | B | B | H | H | H | H | H | H | H | H | H |
| F2-715 | S | B | B | B | B | B | B | B | B | B | B | H | H | H | H | H | H | H | H |
| F2-269 | S | B | B | B | B | B | B | B | B | B | B | B | B | B | H | H | H | H | H |
| F2-1134 | S | B | B | B | B | B | B | B | B | B | B | B | B | B | H | H | H | H | H |
| F2-744 | R | H | H | H | H | H | B | B | B | H | B | B | B | H | H | B | B | B | B |
| F2-1087 | S | B | B | B | B | B | B | B | B | B | B | B | B | B | B | H | H | H | H |
| F2-1402 | S | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | H | H |
| F2-196 | S | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | H | H |

Note: R is resistant, S is susceptible, A is the maternal band type, B is the paternal band type, H is the heterozygous band type

**Table S6. Genotyping result for *CmPMrs* fine-mapping by recombinant individual**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Number | phenotype | PM10m-1 | PM10m-2 | PM10m-3 | PM10m-4 | *PM10R-AD1* | *PM10R-AD2* | *PM10R-AD3* | *PM10R-AD4* | PM10m-5 | PM10m-6 | PM10m-7 | PM10m-8 | PM10m-9 | PM10m-10 | PM10m-11 | PM10m-12 |
| F3-116 | S | A | A | A | A | H | H | H | H | H | H | H | H | H | H | H | H |
| F3-591 | R | H | H | H | H | A | A | A | A | A | A | A | A | A | A | A | A |
| F3-210 | R | H | H | H | A | A | A | A | A | A | A | A | A | A | A | A | A |
| F3-14 | S | A | A | A | H | H | H | H | H | H | H | H | H | H | H | H | H |
| F3-153 | S | A | A | H | H | H | H | H | H | H | H | H | H | H | H | H | H |
| F3-425 | S | A | A | H | H | H | H | H | H | H | H | H | H | H | H | H | H |
| F3-446 | R | H | H | A | A | A | A | A | A | A | A | A | A | A | A | A | A |
| F3-107 | S | A | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H |
| F3-314 | S | H | H | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| F3-398 | S | H | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| F3-106 | R | A | A | A | A | A | A | A | H | H | H | H | H | H | H | H | H |
| F3-233 | R | A | A | A | A | A | A | A | A | A | H | H | H | H | H | H | H |
| F3-400 | S | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H |
| F3-527 | R | A | A | A | A | A | A | A | A | A | A | A | H | H | H | H | H |
| F3-708 | S | H | H | H | H | H | H | H | H | H | H | H | A | A | A | A | A |
| F3-125 | S | H | H | H | H | H | H | H | H | H | H | H | H | A | A | A | A |
| F3-544 | R | A | A | A | A | A | A | A | A | A | A | A | A | A | H | H | H |

Note: R is resistant, S is susceptible, A is the maternal band type, B is the paternal band type, H is the heterozygous band type