**Table S4a:** Powdery mildew resistance genes, their chromosomal location, source of identification and all in this study identified Marker Trait Associations (MTA) of winter wheat A-Genome.

|  |  |  |
| --- | --- | --- |
| **CHR** | **Known genes** | **MTA** |
|  | Short arm | Long arm | Short arm | Long arm |
| Chr1A | Pm3a-r (3,9,94)Pm223899 (80) | Pm17 (4,22) |  | MTA1MTA2 |
| Pm25 (24) |
| Chr2A |  | Pm4a-e (10,23,76,75,77)Pm50 (47)PmPS5A (31)PmLK906 (58)Pm65 (64)Ml92145E8-9 (68) |  | MTA3MTA4MTA5 |
| Chr3A | Pm44 (42) |  |  | **MTA6****MTA7****MTA8****MTA9** |
| Chr4A | Pm16 (20,21) |  |  |
|  | Pm61 (81)PmHHXM (90) |  |  |
| Chr5A | Pm55 (2) | pm2026 (57) |  | MTA10 |
| Chr6A |  | Pm21 (30,61,67)Pm56 (60) |  |  |
| Chr7A |  | Pm1a-e (3,4,7)Pm9 (4)Pm37 (35)Pm59 (1)PmU (54)Mlm2033 (56)Mlm80 (56)Pm60a-c (65,92) | **MTA11** | MTA12MTA13MTA14MTA15MTA16MTA17MTA18MTA19MTA20MTA21MTA22MTA23MTA24MTA25MTA26 |

**Table S4b:** Powdery mildew resistance genes, their chromosomal location, source of identification and all in this study identified Marker Trait Associations (MTA) of winter wheat B-Genome.

|  |  |  |
| --- | --- | --- |
| **CHR** | **Known genes** | **MTA** |
| Short arm | Long arm | Short arm | Long arm |
| Chr1B |  | Pm8 (4)Pm32 (6)Pm39 (36) | MTA27 | MTA28MTA29 |
| Pm28 (27) |
| Chr2B | Pm26 (25)Pm42 (40)Pm49 (46) | Pm6 (14,15,66) Pm33 (31)Pm51 (48) Pm52 (72)Pm57 (49,87) Pm63 (62)Pm64 (59) Pm68 (63) PmQ (91) | MTA30 | MTA31MTA32 |
| Chr3B |  | Pm13 (51) Pm41 (39,64)PmY39 (52) MlZec1 (55) |  |  |
| Chr4B | Pm7 (6,16) |  | MTA33 |
|  | Pm66(83) |  |  |
| Chr5B | Pm30 (29) | Pm36 (34) | MTA34 | MTA35 |
| Chr6B | Pm11 (18)Pm12 (50)Pm14 (19)Pm15 (19)Pm20 (16) | Pm54 (22)pmHYM (85) |  | MTA36MTA37 |
| Pm27 (26) |
| Chr7B | Pm40 (14,38)Pm47 (45) | Pm5a-e (5,11,12)pmDHT (70)Mlxbd (13,86)PmSGD (69)PmBYYT (82) |  | MTA38 |

**Table S4c:** Powdery mildew resistance genes, their chromosomal location, source of identification and all in this study identified Marker Trait Associations (MTA) of winter wheat D-Genome.

|  |  |  |
| --- | --- | --- |
| **CHR** | **Known genes** | **MTA** |
| Short arm | Long arm | Short arm | Long arm |
| Chr1D | Pm24 (13,74) | Pm67 (78) |  | MTA39MTA40MTA41 |
| Pm10 (17) |
| Chr2D |  | Pm43 (14,41) |  | MTA42 |
| Chr3D |  |  |  | **MTA43****MTA44****MTA45****MTA46** |
| Chr4D |  |  |  | **MTA47** |
| Chr5D | Pm2a-c (3,8,84)PmSub (88)PmJM23 (79)Pm10V-2 (71)PmCH1357 (73)Pm46 (44)Pm48 (93) | Pm34 (32)Pm35 (33)PmY201 (53)PmY212 (53) |  |  |
| Chr6D | Pm45 (43) |  | MTA48 | **MTA49** |
| Chr7D | Pm38 (37) | Pm29 (6,28) |  | MTA50MTA51 |
| Pm19 (6) |