

附表 1 目前已报道的四类株型性状相关基因

Attached table1 Reported genes related to the 4 plant architecture traits

性状 Trait	基因 Gene	类别 Category	参考文献 Reference	
叶夹角 Leaf angle	<i>LIGULELESS1 (LG1)</i>	叶舌叶耳发育 (Ligular and auricle development)	[20, 30]	
	<i>LIGULELESS2 (LG2)</i>	叶舌叶耳发育 (Ligular and auricle development)	[32]	
	<i>LIGULELESS3 (LG3)</i>	叶舌叶耳发育 (Ligular and auricle development)	[33-34]	
	<i>LIGULELESS4 (LG4)</i>	叶舌叶耳发育 (Ligular and auricle development)	[34]	
	<i>LIGULELESS NARROW1 (LGN1)</i>	叶舌叶耳发育 (Ligular and auricle development)	[31]	
	<i>NANA PLANT1(NA1)</i> ,又名 <i>DE-ETIOLATED 2, ZmDET2)</i>	油菜素内脂相关 (BR related)	[43]	
	<i>ZmDWF1/NA2</i>	油菜素内脂相关 (BR related)	[44]	
	<i>ZmDWF4</i>	油菜素内脂相关 (BR related)	[45]	
	<i>ZmBRD1</i>	油菜素内脂相关 (BR related)	[46]	
	<i>ZmBRIs</i>	油菜素内脂相关 (BR related)	[47]	
	<i>ZmLl1</i>	油菜素内脂相关 (BR related)	[48]	
	<i>ZmRAVL1</i>	油菜素内脂相关 (BR related)	[36]	
	<i>Brachytic2 (Br2)</i>	生长素相关 (Auxin related)	[49]	
	<i>ZmACS7</i>	乙烯相关 (Ethylene related)	[50]	
	<i>ZmDRL1</i>	叶脉发育 (Vein development)	[39]	
	<i>ZmDRL2</i>	叶脉发育 (Vein development)	[39]	
	<i>ZmCLA4</i>	其他 (Others)	[51]	
	<i>ZmTAC1</i>	其他 (Others)	[52]	
	雄穗分枝数 Tassel branch number	<i>THICK TASSEL DWARF1 (TD1)</i>	分生组织命运决定 (Meristem determinacy)	[62]
		<i>FASCIATED EAR2 (Fea2)</i>	分生组织命运决定 (Meristem determinacy)	[63]
<i>GROWTH REGULATING FACTOR-INTERACTING FACTOR1(GIF1)</i>		分生组织命运决定 (Meristem determinacy)	[64]	
<i>ZFL1</i>		分生组织命运决定 (Meristem determinacy)	[65-66]	
<i>ZFL2</i>		分生组织命运决定 (Meristem determinacy)	[65-66]	
<i>BRANCHED SILKLESS1 (BD1)</i>		分生组织命运决定 (Meristem determinacy)	[67]	
<i>FUZZY TASSEL (FZT)</i>		分生组织命运决定 (Meristem determinacy)	[68]	
<i>INTERMINATE SPIKELET1 (IDS1)</i>		分生组织命运决定 (Meristem determinacy)	[69]	
<i>SISTER of INTERMINATE SPIKELET1 (SID1)</i>		分生组织命运决定 (Meristem determinacy)	[70]	
<i>KNOTTED1 (KN1)</i>		分生组织维持 (Meristem maintenance)	[71-72]	
<i>BLH12</i>		分生组织维持 (Meristem maintenance)	[73]	
<i>BLH14</i>		分生组织维持 (Meristem maintenance)	[73]	
<i>BLADEKILLER1-R (BLK1-R)</i>		分生组织维持 (Meristem maintenance)	[74]	

性状 Trait	基因 Gene	类别 Category	参考文献 Reference
	<i>ROTTEN EAR (RTE)</i>	分生组织维持 (Meristem maintenance) 侧生分生组织的产生和生长 (Lateral meristem	[75]
	<i>VANISHING TASSEL2 (VT2)</i>	initiation and growth) 侧生分生组织的产生和生长 (Lateral meristem	[76]
	<i>SPARSE INFLORESCENCE1 (SPI1)</i>	initiation and growth) 侧生分生组织的产生和生长 (Lateral meristem	[77]
	<i>BARREN INFLORESCENCE2 (BIF2)</i>	initiation and growth) 侧生分生组织的产生和生长 (Lateral meristem	[78]
	<i>BARREN STALK1 (BA1)</i>	initiation and growth)	[79]
	<i>BARREN STALK FASTIGIATE1 (BAF1)</i>	侧生分生组织的产生和生长 (Lateral meristem initiation and growth)	[80]
	<i>BRANCH ANGLE DEFECTIVE 1(BAD1)</i>	侧生分生组织的产生和生长 (Lateral meristem initiation and growth)	[81]
	<i>RAMOSA1 (RA1)</i>	侧生分生组织的产生和生长 (Lateral meristem initiation and growth)	[82]
	<i>RAMOSA2 (RA2)</i>	侧生分生组织的产生和生长 (Lateral meristem initiation and growth)	[83]
	<i>RAMOSA3 (RA3)</i>	侧生分生组织的产生和生长 (Lateral meristem initiation and growth)	[84]
	<i>RAMOSA ENHANCER LOCUS2 (REL2)</i>	侧生分生组织的产生和生长 (Lateral meristem initiation and growth)	[85]
	<i>UNBRANCHED2(UB2)</i>	侧生分生组织的产生和生长 (Lateral meristem initiation and growth)	[87]
	<i>UNBRANCHED3(UB3)</i>	侧生分生组织的产生和生长 (Lateral meristem initiation and growth)	[87]
	<i>TASSELSHEATH4(TSH4)</i>	侧生分生组织的产生和生长 (Lateral meristem initiation and growth)	[86-87]
	<i>LIGULELESS1 (LG1)</i>	侧生分生组织的产生和生长 (Lateral meristem initiation and growth)	[20]
	<i>LIGULELESS2 (LG2)</i>	侧生分生组织的产生和生长 (Lateral meristem initiation and growth)	[20, 88]
	<i>ZmD53</i>	initiation and growth)	[89]
	<i>INDETERMINATE1 (ID1)</i>	开花期相关 (Flowering time related)	[90]
	<i>DELAYED FLOWERING1(DLF1)</i>	开花期相关 (Flowering time related)	[91]
	<i>ZCN1</i>	开花期相关 (Flowering time related)	[92]
	<i>ZCN2</i>	开花期相关 (Flowering time related)	[92]
	<i>ZCN3</i>	开花期相关 (Flowering time related)	[92]
	<i>ZCN4</i>	开花期相关 (Flowering time related)	[92]
	<i>ZCN5</i>	开花期相关 (Flowering time related)	[92]
	<i>ZCN6</i>	开花期相关 (Flowering time related)	[92]
	<i>ZmCCT10</i>	开花期相关 (Flowering time related)	[93]

性状 Trait	基因 Gene	类别 Category	参考文献 Reference
	<i>Zm00001d006055</i>	其他 (Others)	[94]
株高/穗位高 Plant height /Ear height	<i>DWARF1(D1, ZmGA3ox2)</i>	赤霉素相关 (GA related)	[112]
	<i>DWARF3 (D3)</i>	赤霉素相关 (GA related)	[111]
	<i>DWARF5 (D5)</i>	赤霉素相关 (GA related)	[109]
	<i>ANTHER EAR 1 (An1)</i>	赤霉素相关 (GA related)	[108]
	<i>AN2 (Cpps2)</i>	赤霉素相关 (GA related)	[110]
	<i>ZmGA20ox3</i>	赤霉素相关 (GA related)	[113-114]
	<i>ZmGA20ox5</i>	赤霉素相关 (GA related)	[114]
	<i>DWARF8 (D8)</i>	赤霉素相关 (GA related)	[115-116]
	<i>DWARF9 (D9)</i>	赤霉素相关 (GA related)	[116]
	<i>ZmSPL12</i>	赤霉素相关 (GA related)	[117]
	<i>VANISHING TASSEL2 (VT2)</i>	生长素相关 (Auxin related)	[76]
	<i>SPARSE INFLORESCENCE1 (SPI1)</i>	生长素相关 (Auxin related)	[77]
	<i>Brachytic2(Br2)</i>	生长素相关 (Auxin related)	[118]
	<i>BREVIS PLANT1(BV1)</i>	生长素相关 (Auxin related)	[119]
	<i>ZmPIN1a</i>	生长素相关 (Auxin related)	[120]
	<i>NANA PLANT1(NA1,又名</i>		
	<i>DE-ETIOLATED2, ZmDET2)</i>	油菜素内脂相关 (BR related)	[43]
	<i>ZmDWF1/NA2</i>	油菜素内脂相关 (BR related)	[44]
	<i>ZmDWF4</i>	油菜素内脂相关 (BR related)	[45]
	<i>ZmBRD1</i>	油菜素内脂相关 (BR related)	[46]
	<i>CAROTENOID CLEAVAGE</i>		
	<i>DIOXYGENASE8(ZmCCD8)</i>	独脚金内酯相关 (SL related)	[121]
	<i>ZmD53</i>	独脚金内酯相关 (SL related)	[50]
	<i>THICK TASSEL DWARF 1(TD1)</i>	分生组织命运决定或维持相关 (Meristem determinacy or maintenance)	[63]
	<i>COMPACT PLANT2 (CT2)</i>	分生组织命运决定或维持相关 (Meristem determinacy or maintenance)	[123]
	<i>DWARF & IREGULAR LEAF1</i>	分生组织命运决定或维持相关 (Meristem determinacy or maintenance)	[124]
	<i>(DWIL1)</i>	分生组织命运决定或维持相关 (Meristem determinacy or maintenance)	[124]
	<i>BLH12</i>	分生组织命运决定或维持相关 (Meristem determinacy or maintenance)	[73]
	<i>BLH14</i>	分生组织命运决定或维持相关 (Meristem determinacy or maintenance)	[73]
	<i>GROWTH REGULATING</i>		
	<i>FACTOR-INTERACTING FACTOR1</i>	分生组织命运决定或维持相关 (Meristem determinacy or maintenance)	[64]
	<i>(GIF1)</i>	分生组织命运决定或维持相关 (Meristem determinacy or maintenance)	[64]
	<i>ELONGATED MESOCOTYLI</i>		
	<i>(ELM1)</i>	光信号相关 (Light signal related)	[125]

性状 Trait	基因 Gene	类别 Category	参考文献 Reference
	<i>ZmPHYB1</i>	光信号相关 (Light signal related)	[126-127]
	<i>ZmPHYB2</i>	光信号相关 (Light signal related)	[126]
	<i>ZmPHYC1</i>	光信号相关 (Light signal related)	[128]
	<i>ZmPHYC2</i>	光信号相关 (Light signal related)	[128]
	<i>ZmPIF3.3</i>	光信号相关 (Light signal related)	[17]
	<i>TANGLED1 (TAN1)</i>	其他 (Others)	[131]
	<i>ZmRPH1</i>	其他 (Others)	[132]
	<i>qPH7</i>	其他 (Others)	[133]
	<i>ZmEMF1L1</i>	其他 (Others)	[18]
	<i>Zm00001d011140</i>	其他 (Others)	[94]
	<i>ZmPYL10</i>	其他 (Others)	[134]
	<i>SUCROSE EXPORT DEFECTIVE1 (SXD1)</i>	其他 (Others)	[135]
	<i>ROOTHAIR DEFECTIVE1 (RTH1)</i>	其他 (Others)	[136]
	<i>CR4</i>	其他 (Others)	[137]
	<i>VP8</i>	其他 (Others)	[138]
	<i>RS2</i>	其他 (Others)	[139]
开花期 Flowering time	<i>Elongated Mesocotyl1 (ELM1)</i>	光信号途径 (Light signal pathway)	[125]
	<i>ZmPHYB1</i>	光信号途径 (Light signal pathway)	[126] [126, 134,
	<i>ZmPHYB2</i>	光信号途径 (Light signal pathway)	148]
	<i>ZmPHYC1</i>	光信号途径 (Light signal pathway)	[128]
	<i>ZmPHYC2</i>	光信号途径 (Light signal pathway)	[128]
	<i>ZmCCA1</i>	光周期和生物钟途径 (Photoperiod and circadian clock pathway)	[151]
	<i>ZmLHY</i>	光周期和生物钟途径 (Photoperiod and circadian clock pathway)	[145-146]
	<i>ZmPRR7</i>	光周期和生物钟途径 (Photoperiod and circadian clock pathway)	[159]
	<i>ZmPRR73</i>	光周期和生物钟途径 (Photoperiod and circadian clock pathway)	[145-146, 150]
	<i>ZmPRR37</i>	光周期和生物钟途径 (Photoperiod and circadian clock pathway)	[145-146, 152]
	<i>ZmPRR59</i>	光周期和生物钟途径 (Photoperiod and circadian clock pathway)	[145-146]
	<i>ZmTOC1a</i>	光周期和生物钟途径 (Photoperiod and circadian clock pathway)	[151]
	<i>ZmTOC1b</i>	光周期和生物钟途径 (Photoperiod and circadian clock pathway)	[151]

性状 Trait	基因 Gene	类别 Category	参考文献 Reference
	<i>ZmG11a</i>	光周期和生物钟途径 (Photoperiod and circadian clock pathway)	[153]
	<i>ZmG11b</i>	光周期和生物钟途径 (Photoperiod and circadian clock pathway)	[153]
	<i>ZmELF3.1</i>	光周期和生物钟途径 (Photoperiod and circadian clock pathway)	[158]
	<i>ZmELF3.2</i>	光周期和生物钟途径 (Photoperiod and circadian clock pathway)	[158]
	<i>ZmLUX1</i>	光周期和生物钟途径 (Photoperiod and circadian clock pathway)	[158]
	<i>ZmLUX2</i>	光周期和生物钟途径 (Photoperiod and circadian clock pathway)	[158]
	<i>ZmLUX3</i>	光周期和生物钟途径 (Photoperiod and circadian clock pathway)	[158]
	<i>ZmLUX4</i>	光周期和生物钟途径 (Photoperiod and circadian clock pathway)	[158]
	<i>ZmELF4.1</i>	光周期和生物钟途径 (Photoperiod and circadian clock pathway)	[158]
	<i>ZmELF4.2</i>	光周期和生物钟途径 (Photoperiod and circadian clock pathway)	[158]
	<i>ZmCONZI</i>	光周期和生物钟途径 (Photoperiod and circadian clock pathway)	[149]
	<i>ZmCOL3</i>	光周期和生物钟途径 (Photoperiod and circadian clock pathway)	[156]
	<i>ZmCCT9</i>	光周期和生物钟途径 (Photoperiod and circadian clock pathway)	[155]
	<i>ZmCCT10</i>	光周期和生物钟途径 (Photoperiod and circadian clock pathway)	[152, 154]
	<i>ZmNF-YA3</i>	光周期和生物钟途径 (Photoperiod and circadian clock pathway)	[157]
	<i>ZmNF-YC2</i>	光周期和生物钟途径 (Photoperiod and circadian clock pathway)	[157]
	<i>INDETERMINATE1 (ID1)</i>	自主途径 (Autonomous pathway)	[90]
	<i>VGT1</i>	自主途径 (Autonomous pathway)	[160]
	<i>ZmRAP2.7</i>	自主途径 (Autonomous pathway)	[160]
	<i>ZmMADS69</i>	自主途径 (Autonomous pathway)	[161]
	<i>DWARF1(D1, ZmGA3ox2)</i>	赤霉素途径 (GA pathway)	[162]
	<i>DWARF3 (D3)</i>	赤霉素途径 (GA pathway)	[162]
	<i>DWARF5 (D5)</i>	赤霉素途径 (GA pathway)	[162]
	<i>ANTHER EAR1 (An1)</i>	赤霉素途径 (GA pathway)	[162]
	<i>DWARF8 (D8)</i>	赤霉素途径 (GA pathway)	[116, 163]
	<i>DWARF9 (D9)</i>	赤霉素途径 (GA pathway)	[116]

性状 Trait	基因 Gene	类别 Category	参考文献 Reference
	<i>CORNGRASS1 (Cg1)</i>	年龄途径 (Aging pathway)	[167]
	<i>ZmMIR156s</i>	年龄途径 (Aging pathway)	[167]
	<i>ZmMIR172s</i>	年龄途径 (Aging pathway)	[167-168]
	<i>GLOSSY15(GU15)</i>	年龄途径 (Aging pathway)	[168-169]
	<i>ZmSPL13</i>	年龄途径 (Aging pathway)	[170]
	<i>ZmSPL129</i>	年龄途径 (Aging pathway)	[170]
			[143,
	<i>ZCN8</i>	信号整合因子 (Pathway integrators)	173-174]
	<i>ZCN7</i>	信号整合因子 (Pathway integrators)	[171-172]
	<i>ZCN12</i>	信号整合因子 (Pathway integrators)	[171-172]
	<i>DELAYED FLOWERING1(DLF1)</i>	信号整合因子 (Pathway integrators)	[91]
	<i>ZmMADS1</i>	信号整合因子 (Pathway integrators)	[175]
	<i>ZMM4</i>	信号整合因子 (Pathway integrators)	[176]
	<i>ZFL1</i>	信号整合因子 (Pathway integrators)	[65-66]
	<i>ZFL2</i>	信号整合因子 (Pathway integrators)	[65-66]
	<i>KERNEL NUMBER PERROW6</i>		
	<i>(KNR6)</i>	其他 (Others)	[177]
	<i>ZmEMF1L1</i>	其他 (Others)	[18]