表 1 CRISPR/Cas9 系统在水稻品质遗传改良中的应用
Table 1 Application of CRISPR/Cas9 system in genetic improvement of rice quality

品质类型 Quality type	编辑基因 Editing gene	Cas9 启动子 Cas9 promoter	SgRNA 启动子 SgRNA promoter	突变体表型 Mutant type	参考文献 Reference
外观和加工品质 Appearance and processing quality	*OsGS3* 和 *OsGn1a* *OsGS3* and *OsGn1a*	2x35S 2x35S	OsU3 OsU3	粒长变长，千粒重增加，每穗粒数增加 Longer grain length, increased 1000-grain weight and more grains per panicle	(沈兰等, 2017)
	OsTGW6 *OsTGW6*	ZmUbi ZmUbi	OsU3/OsU6a OsU3/OsU6a	提高千粒重 Improved the thousand-grain weight	(王加峰等, 2016)
	OsGW2、*OsGW5* 和 *OsTGW6* *OsGW2*、*OsGW5* and *OsTGW6*	pUBQ pUBQ	OsU3、OsU6 和 TaU3 OsU3、OsU6 and TaU3	粒长和千粒重增加 Longer grain length and increased 1000-grain weight	(Xu et al., 2016)
	OsTGW6 和 *OsChalk5* *OsTGW6* and *OsChalk5*	pUbi pUbi	OsU3 和 OsU6a OsU3 and OsU6a	垩白度增加 Increased grain chalkiness	(郑才敏, 2016)
蒸煮食味品质 Cooking taste quality	*OsWx* *OsWx*	pUbi pUbi	OsU6 OsU6	直链淀粉含量降低 Decreased the accumulation of amylose	(汪秉琨等, 2018)
	OsISA1 *OsISA1*	pUbi pUbi	OsU6 OsU6	胚乳萎缩，淀粉粒异常 Shrunken endosperm and abnormal starch granules	(Shufen et al., 2019)
	OsPUL *OsPUL*	2x35S 2x35S	OsU3 OsU3	直链淀粉减少，储藏蛋白增加 Decreased amylose and increased storage protein	(奉宝兵等, 2019)
	OsSBE3 *OsSBE3*	35S 35S	OsU6 OsU6	抗性淀粉含量增加 Increased the resistant starch content	(白建江等, 2018)
	OsSSIIIa 和 *OsPPDK* *OsSSIIIa* and *OsPPDK*	pUbi pUbi	OsU6a/Os6b OsU6a/Os6b	抗性淀粉含量增加 Increased the resistant starch content	(吴清清, 2019)
	OsBadh2 *OsBadh2*	2x35S 2x35S	OsU6/OsU3 OsU6/OsU3	香型水稻 Fragrant rice	(王付华等, 2018)
	OsBadh2 和 *OsWx* *OsBadh2* and *OsWx*	pUbi pUbi	OsU6a/OsU6b OsU6a/OsU6b	较低直链淀粉含量且带香味 Lower amylose content and fragrant rice	(杨平等, 2019)
	OsGluA3 *OsGluA3*	pUbi pUbi	OsU6a OsU6a	谷蛋白含量降低 Decreased the gluten content	(周优等, 2019)
营养品质 Nutritional quality	*OsCYP97A4*、*OsDSM2*、*OsCCD4a*、*OsCCD4b* 和 *OsCCD* *OsCYP97A4*、*OsDSM2*、*OsCCD4a*、*OsCCD4b* and *OsCCD*	ZmUbi ZmUbi	OsU3 OsU3	调控胚乳中类胡萝卜素含量 Regulation of β-carotene accumulation in rice endosperm	(Yang et al., 2017)
	OsNramp5 *OsNramp5*	pUbi pUbi	OsU6 OsU6	降低镉含量 Low-Cd-accumulating rice	(Tang et al., 2017)