



Fig. S2 Identification of the *HO* knockout and the mating types in the haploid parents.

(a) Identification of the *HO* knockout in the haploid parents M: DL5000, 1: the amplification result of *HO* verification primer and (b) identification for the mating types of the haploid parents M: BM2000; Lanes are NX9412-4, 31y3-37, 31y10-9, 31y10-27, respectively.