



Identification of neutral genes at pollen sterility loci *Sd* and *Se* of cultivated rice (*Oryza sativa*) with wild rice (*O. rufipogon*) origin

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ABSTRACT. Pollen sterility is one of the main hindrances against the utilization of strong intersubspecific (*indica-japonica*) heterosis in rice. We looked for neutral alleles at known pollen sterility loci *Sd* and *Se* that could overcome this pollen sterility characteristic. Taichung 65, a typical *japonica* cultivar, and its near isogenic lines E7 and E8 for pollen sterility loci *Sd* and *Se* were employed as tester lines for crossing with 13 accessions of wild rice (*O. rufipogon*). Pollen fertility and genotypic segregations of the molecular markers tightly linked with *Sd* and *Se* loci were analyzed in the paired F₁s and F₂ populations. One accession of wild rice (GZW054) had high pollen fertility in the paired F₁s between Taichung 65 and E7 or E8. Genotypic segregations of the molecular markers tightly linked with *Sd* and *Se* loci fit the expected Mendelian ratio (1:2:1), and non-significances were shown among the mean pollen fertilities with the maternal, parental, and heterozygous genotypes of each molecular markers tightly linked with *Sd* and *Se* loci. Evidentially, it indicated that the alleles of *Sd* and *Se* loci for GZW054 did not interact with those of Taichung 65 and its near isogenic lines, and, thus were identified as neutral alleles *Sdⁿ* and *Seⁿ*. These neutral

genes could become important germplasm resources for overcoming pollen sterility in *indica-japonica* hybrids, making utilization of strong heterosis in such hybrids viable.

Key words: Rice (*Oryza sativa*); Wild rice (*Oryza rufipogon*); Pollen sterility; Neutral gene; Molecular marker