Ke d : Tissue culture; Single nucleotide polymorphisms; Somaclonal variance; Genetic variants

I d c

It is well known that plants have the capacity to regenerate via in vitro tissue culture from totipotent, di erentiated somatic cells. Somaclonal variation is the word used to describe a phenomena that has been linked to a number of genetic and epigenetic instabilities, some

occurring mutations. is may be because all higher eukaryotes under study use the same highly conserved mechanism of deamination of methylated cytosines [13].

When considered as a whole, it is evident that the types, rates, and spectra of tissue culture-induced mutagenesis are highly variable and may di er depending on the species, genotypes, and tissue culture conditions, or may simply be accidental. Both previous studies and our data here showed that at least TE mobilisation occurs concurrently with DNA methylation dynamics, consistent with their repressive control by this epigenetic marker. is is contrary to our previous nding based on DNA marker analysis that genetic mutation is the major type of molecular changes associated with rice tissue culture. Given that tissue culture induced mutagenesis is known to occur stochastically, the participation of epigenetic processes supports the fortunate component of this process [14].

C c

Prior research has discovered domestication-related rice areas that are genetically brittle and vulnerable to mutations in the presence of natural selection. Here, we demonstrated that there was minimal correlation between the genomic areas that were hyper-mutagenic in tissue culture and those that were hyper-mutable in the wild. is implies that natural mutation and tissue culture-induced mutagenesis may have di erent mutagenic pathways. Of fact, since the somaclonal line (TC-reg-2008) we utilised has only experienced eight generations without deliberate selection, we cannot completely rule out the notion that long-term selection was what made the di erence. However, we believe that further research is necessary to elucidate any novel potential applications of tissue culture in crop development.

Ac ed e e

None

C c f I e e

None

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