



Morphological variation of mutant sunflowers (*Helianthus annuus*) induced by space flight and their genetic background detection by SSR primers

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ABSTRACT. After sunflower seeds were exposed to space conditions, various mutant plants were screened from the descendent plants. The morphological characters of plants changed in flower color from golden to yellow, light yellow, or even to yellowish green. The ligulate petals of the unisexual floret broadened, or became thin, while the short tubular petals of bisexual floret elongated to some extent, or even turned into semi-ligulate petals or ligulate petals, making the phenotype of the whole inflorescence like a chrysanthemum. The shape and thickness of leaves varied in some of these plants. Absolute sterile plants in mutant plants were found to possess neither normal bisexual florets nor unisexual florets, but the “pseudo-floret” only consisted of pieces of shield-like bracts on protuberant floral disc. Thirty-five pairs of simple sequence of repeat primers were used to detect the genetic variation of

the plants, and the results showed that only a variation was tested in the mutant plants from 4 primers. The different PCR products obtained were extracted for sequencing and alignment analysis, and the aligned results showed that the DNA sequence changed by deletion, insertion and replacement that occurred at some sites. The results proved the high mutagenic efficacy of space flight, and ways of DNA transformation due to space conditions.

Key words: Sunflower; Space flight; Morphological character; Simple sequence repeat; Alignment analysis