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Polymorphism analysis of multi-parent advanced generation inter-cross (MAGIC) populations of upland cotton developed in China

D.G. Li[1]*, Z.X. Li[1]*, J.S. Hu[1], Z.X. Lin[2] and X.F. Li[1]

[1]Institute of Crop Genetic and Breeding, Yangtze University, Jingzhou, Hubei Province, China
[2]National Key Laboratory of Crop Genetic Improvement, College of Plant Science & Technology of Huazhong Agricultural University, Wuhan, Hubei Province, China

*These authors contributed equally to the study.
Corresponding authors: X.F. Li / Z.X. Lin
E-mail: lixiaofang@163.net / linzhongxu@mail.hzau.edu.cn.

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ABSTRACT. Upland cotton (*Gossypium hirsutum* L.) is an important cash crop that provides renewable natural fiber worldwide. Currently limited genetic base leads to a decrease in upland cotton genetic diversity. Multi-parent advance generation inter-cross (MAGIC) populations can be used to evaluate complex agronomic traits in crops. In this study, we developed an upland cotton MAGIC population. A total of 258 MAGIC population lines and their twelve founder lines were analyzed, using 432 pairs of simple sequence repeat (SSR) markers. Gene diversity indices and the polymorphism information content

were calculated using polymorphism analyses. Our genotype analysis showed that 258 inbred lines could be divided into 158 genotypes. Among these, we identified 17 pairs of specific SSR primers on the A chromosome subgroups and 24 pairs of specific SSR primers on the B chromosome subgroups of upland cotton. These were related to 77 and 128 genotypes, respectively. Our results suggest that the upland cotton MAGIC population contained abundant genetic diversity and may provide enormous resources for future genetic breeding.

Key words: Upland cotton; MAGIC; SSR; Genetic diversity