Genetic Analysis of Yield Traits and Fiber Qualities by Using Major Gene Plus Polygene Mixed Inheritance Model in Upland Cotton (*G. hirsutum* **L.**)

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Abstract: The method of major gene plus polygene mixed inheritance model was used to analyze the genetics of yield traits and fiber qualities in (Simian 3 × TM-1) and (Simian × CARMEN). The optimum model of boll size in cross I is even dominant major genes plus polygene mixed inheritance model, and that of seed weight is negative dominant major gene plus polygene mixed inheritance model. The optimum model of lint percent is two major genes plus polygene and that of boll numbers per plant is one major gene plus polygenes. In cross II, the optimum models of lint percent, seed weight, boll numbers per plant, boll size, uniformity and Micronaire are all polygene models without major gene, while those of length, strength and elongation are one major gene plus polygene mixed inheritance models. The number of major gene are consistent with that of QTLs. The segregation analysis of quantitative traits in this paper by using P_1, P_2, F_1 and $F_{2,3}$ generations, compared with using single generation, is more accurate and can identify polygenes.

Key words: yield; fiber qualities; major gene plus polygene; inheritance model; upland cotton