



Genetic analysis of the major gene plus polygene model in soybean resistance to *Leguminivora glycinivorella*

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ABSTRACT. In order to investigate the genetic characteristics of soybean *Leguminivora glycinivorella* resistance and to improve soybean resistance insectivorous breeding efficiency by applying the multi-generation joint analysis method of the major gene plus polygene model, 5 pedigrees and generations (P1, F1, P2, F2, and F2:3) were used as the materials to perform the soybean *L. glycinivorella* resistance multi-generation joint analysis. The results showed that soybean resistance to *L. glycinivorella* was controlled and inherited by an additive major gene plus additive, dominant polygene. The major gene had a negative additive effect ($d = -0.1633$). The combination of the anti-*L. glycinivorella* genes showed negative heterosis. Because the polygene additive effects were positive, the polygene effects would increase the insect herbivory rate in the F1 generation. This hybrid combination showed an insect herbivory rate polygenic heritability of 21.9556 and 54.3490% in the F2 and F2:3 pedigrees, which presented a high heritability. Therefore, it was appropriate to perform the selective breeding of the insect herbivory rate in the late generation.

Key words: Soybean; Major gene plus polygene; Insect herbivory rates; Genetic analysis