

Abstract

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Localization of a gene controlling resistance to downy mildew
disease in soybean
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The objective of this study was to identify regions of the genome with QTLs for the resistance genes to downy mildew and identify molecular markers linked to the QTLs. 176 F_{2:4} population lines from a cross of “Nakhon Sawan 1” (susceptible parent) X AGS 129 (resistant parent) and parents were evaluated for downy mildew incidence (DMI) and 6 agronomic characteristics. 43 simple sequence repeat (SSR) markers was shown the polymorphism between the parental lines, which were used to investigate the polymorphism for all the F₂ individuals. The data were analyzed by QTL Cartographer program for SSR polymorphic markers. The major QTL for downy mildew resistance was determined on chromosome 19 (*QTL_dmi_1*). This QTL was linked to marker Satt513 accounted for 11.69 % of the phenotypic variance. For plant height, by CIM analysis, one QTL was closely flanked by markers Satt513 and Satt527 on chromosome 19 (*QTL_ph_1*) which explained 24.71% of the phenotypic variance. QTL for leaf area were in the same chromosome as downy mildew resistance and plant height. The results indicated that the identification of DNA markers linked to the QTLs could be further applied for marker-assisted selection (MAS) to develop cultivars with resistance to downy mildew in soybean.

Keywords : Quantitative trait loci; soybean; downy mildew; *Peronospora manshurica*;
plant disease resistance