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摘要: 蔓生性 (vining growth habit, VGH) 是野生大豆茎的生长习性, 对其遗传规律的研究有助于全面了解大豆株型及驯化特点。以南农86-4×PI342618B种间杂交衍生的重组自交系群体NJRI-NP的亲本和 286个家系为材料, 利用含226个标记的遗传图谱, 采用WinQTLCart 2-5软件的复合区间作图法对2013和2014年开花期 (R1) 和成熟期 (R8) 蔓生性数据进行了QTL定位分析。结果开花期检测到4个蔓生性QTL, 分别位于D1a (Chr. 1)、G (Chr. 18) 和L (Chr. 19) 连锁群, 其中qVGH-D1a、qVGH-G-1和qVGH-G-2两年均能检测到; qVGH-G-2两年的贡献率分别达14.16%和14.18%, 是控制开花期蔓生性的稳定主效QTL。成熟期蔓生性两年均检测到位于G和L连锁群上的qVGH-G-1和qVGH-L位点, 其中qVGH-G-1在开花期和成熟期的表现贡献率相当, 是稳定表现的QTL; 而qVGH-L由于贡献率大 (两年R²分别为39.11%和23.14%), 是控制成熟期蔓生性的主效QTL, 其可能与结荚习性基因相关。促进蔓生性的等位基因均来自野生大豆PI342618B, 但控制开花期和成熟期蔓生性的遗传体系不尽相同。

Abstract: Vining growth habit is the basic characteristics of annual wild soybean. In the present study, 286 lines of a recombinant inbred line population (NJRI-NP) derived from the cross between Nanmang 86-4 and PI342618B were used to conduct field experiments. Vining growth habit was investigated at beginning flowering (R1) and full maturity stage (R8) in 2013 and 2014, respectively. The composite interval mapping (CIM) of the software WinQTLCart 2.5 was used to map QTL with a genetic linkage map of 226 markers. The linkage group D1a (Chromosome 1), G (Chr-18) and L (Chr-19) were found to be related with vining growth habit at R1 stage. The QTL qVGH-D1a, qVGH-G-1 and qVGH-G-2 was detected during the two years, the QTL qVGH-G-2, which accounted for 14.16% and 14.18% of phenotypic variation, was the major QTL controlling vining growth habit at R1 stage. Two loci qVGH-G-1 and qVGH-L were found for vining growth habit at R8 stage. The qVGH-G-1 on linkage group G had similar contribution of phenotypic variation at both R1 and R8 stages, indicating that the locus was a stable one at whole growth period. The qVGH-L on linkage group L accounted for 39.11% and 23.14% of phenotypic variation in two years respectively, was considered to be a major QTL controlling vining growth habit at R8 stage. It might be related to determinate habit gene D1 according to its physical position on the chromosome. All positive alleles of vining growth habit are from PI342618B. However, the genetic system of vining growth habit at R1 stage is different from that at R8 stage.

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