

植物遗传学

## 抗病基因Bdv2抑制大麦黄矮病毒复制和运动的分子证据

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**摘要** 小麦-中间偃麦草易位系YW642含有一个源于中间偃麦草7X染色体的抗性基因Bdv2, 对大麦黄矮病毒GAV株系具有高度抗性。为有效控制该病毒和阐明抗黄矮病机制, 采用半定量RT-PCR的方法, 研究了大麦黄矮病毒GAV株系在YW642及其感病姊妹系YW641中积累的差异。分别在接种病毒不同时间、不同部位上取样, 用半定量RT-PCR的方法来检测GAV的积累浓度。在接种部位, 抗病植株中病毒的浓度远远低于感病植株。在侵染前5 d, 抗病植株YW642中病毒会有一定程度的复制和积累, 但随后病毒浓度开始下降, 接种14~16 d时没有检测到病毒; 而在感病株系中, 病毒积累的浓度远远高于抗病植株, 并一直维持一个较高的浓度。在未接种部位, 感病植株中可检测到较高浓度的病毒, 说明病毒能从接种点很快运动到未接种部位, 并大量复制。而在抗病系YW642中, 未接种部位始终未检测到病毒。本结果从分子水平上证明, 在抗病植株中BYDV的复制和运动均受到了极大的抑制。这是抗病基因Bdv2与BYDV互作后, 激活了一系列防御基因的结果。另外本研究还确定了防御基因诱导表达的时间, 为从抗病植株中分离抗病相关基因、研究抗黄矮病机制提供了取样的依据。

**关键词** [大麦黄矮病毒; 半定量RT-PCR; 小麦-中间偃麦草易位系; 抗性](#)

分类号

## Molecular Evidence of Barley Yellow Dwarf Virus Replication/Movement Suppressed by the Resistance Gene Bdv2

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### Abstract

A wheat-Thinopyrum intermedium translocation line YW642 possesses the resistance to GAV serotype of barley yellow dwarf virus (BYDV), in which the resistance gene Bdv2 is derived from the chromosome 7X of Thinopyrum intermedium group 7. It is interesting to analyze BYDV accumulation in the resistant and susceptible wheat plants for controlling BYDV disease and understanding the resistance mechanism against BYDV. In the paper, semi-quantitative reverse-transcription PCR (RT-PCR) was used to detect and quantify BYDV-GAV in the resistant and susceptible plants using specific primers for the coat protein (CP) and RNA-dependent RNA polymerase (RdRp) genes of BYDV-GAV serotype respectively. On the inoculation site, the amount of the virus in the resistant wheat line (YW642) was much lower compared to the susceptible sib line (YW641). There was small amount of the virus could be detected in YW642 at 2~5 days post infestation (dpi), after that the amount of virus decreased and no virus could be detected at 14 and 16 dpi. In the uninoculated upper leaves, no BYDV was detected in YW642 from 1 to 14 dpi, while the virus could be detected at 3 dpi and then accumulated rapidly in YW641. These results showed at molecular level that the replication and/or movement of BYDV-GAV were strongly suppressed in YW642, presumably owing to the action of the Bdv2 gene.

**Key words** [barley yellow dwarf virus](#) [semi-quantitative RT-PCR](#) [wheat-Thinopyrum intermedium translocation lines](#) [resistance](#)

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