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[home](#) [page](#) [about us](#) [contact](#) 

[us](#)

Table of  
Contents

[CJGPB 2015](#)

[CJGPB 2014](#)

[CJGPB 2013](#)

[CJGPB 2012](#)

[CJGPB 2011](#)

[CJGPB 2010](#)

[CJGPB 2009](#)

[CJGPB 2008](#)

[CJGPB 2007](#)

[CJGPB 2006](#)

[CJGPB 2005](#)

[CJGPB 2004](#)

**CJGPB 2003**

**CJGPB 2002**

**CJGPB**

**Home**

---

**Editorial  
Board**

**For Authors**

- **Authors  
Declaration**
- **Instruction  
to Authors**
- **Guide for  
Authors**
- **Copyright  
Statement**
- **Fees**
- **Submission**

**For  
Reviewers**

- **Guide for  
Reviewers**
  - **Reviewers  
Login**
- 

**Subscription**

Variability of *PSPAL1* (phenylalanine ammonia-lyase gene-1) proximal promoter sequence and expression in pea challenged with *Mycosphaerella pinodes*

Okorska S., Michalczyk D., Okorski A., Piotrowicz-Cieślak A., Pupel P., Głowacka K., Jagielska T., Górecki R.:

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[ [fulltext](#) ]

Part of the *PSPAL1* gene (corresponding to the proximal promoter, exon 1 and intron) from eight pea varieties was sequenced and compared to the published sequence of *PSPAL1* gene from Midoriusui cultivar (GenBank: D10002.1). The sequences showed a very high level of identity (96–99%), except in five varieties there occurred a motif TTATTACAAAATATTA close to the Goldberg-Hogness (TATA) box, and it was not detected in the other four varieties, including Midoriusui. Plants of eight pea varieties were subjected to controlled infection with *Mycosphaerella pinodes* and the disease index was determined (it ranged from 5.2 to 42.3%). The *PSPAL1* gene of the most resistant cultivar (Walor) contained the above-mentioned motif and that of the most

relationship was not clear in varieties with intermediate levels of resistance. In four varieties (Walor, Ezop, Ramrod and Polar) the expression level of *PSPAL1* gene in leaves was analysed (1, 3, 6, 9, 12 and 15 h post inoculation) and it showed a weak negative correlation with disease severity ( $R = -0.53$ ). The activation of *PSPAL1* gene occurred not only in infected pea leaves but also in stems and – to a much lower degree – in roots (with the relative level of *PSPAL1* transcripts amounting to 0.15 in roots and 38.75 in leaves), indicating some kind of signal transmission beyond the infected plant tissues.

### **Keywords:**

expression; *Mycosphaerella pinodes*; phenylalanine ammonia-lyase gene-1; *Pisum sativum*; polymorphism; resistance

[ [fulltext](#) ]

