

()

Meloidogyne javanica

Trichoderma harzianum

*

(/ / : / / :)

Meloidogyne javanica

Trichoderma harzianum

)

(

($P \leq 0/05$)

()

+

%

Meloidogyne spp.

(Chitwood, 1949)

(Vovlas & Castillo, 2004; Elad *et al.*, 1983)

(Vovlas & Castillo, 2004; Elad *et al.*, 1983)

T. harzianum

()

M. hapla

(Brants *et al.*, 2000)

POX (EC; 1.11.1.7 donor;

hydroxyl oxidoreductase)

(Zacheo *et al.*, 1993; Mohammadi *et al.*,
2002; Silva *et al.*, 2004)

(Mader &
Fusel, 1982; Peng & Kuc, 1992; Zacheo *et al.*,
1993; Mohammadi *et al.*, 2002)

(Mohammadi *et al.*, 2002)

(Peng & Kuc 1992;
Zacheo *et al.*, 1993; Zacheo *et al.*, 1995;
Mohammadi *et al.*, 2002)

(Mohammadi *et al.*, 2002; Silva

et al., 2004)

T. viride

M. javanica

(2006) Sahebani *et al.*

(Zacheo *et al.*, 1993)

(1995) Zacheo *et al.*

M. incognita

T. harzianum

Meloidogyne

(Williamson & *javanica*
Hussay, 1996; Harman, 2000; Sharon *et al.*, 2001;
Harman *et al.*, 2004)

Trichoderma

(Elad *et al.*, 1983; Kubicek & Harman, 1998;
Sharon *et al.*, 2001)

T. harzianum

(Williamson & Hussay, 1996; Harman,
2000; Chet & Hennis, 2003; Harman *et al.*, 2004)

T. harzianum

(Kubicek & Harman, 1998; Sharon *et al.*, 2001;
Chet & Shires, 2003; Harman *et al.*, 2004)

T. harzianum T-12

(egg mass)

T. koningii

M. arenaria

(Windham *et al.*, 1989)

(T-203)

T. harzianum

Meloidogyne spp.

()

(Sharon *et al.*, 2001)

T. viride

(Khan & Saxena, 1997)

T. harzianum

Globodera rostochiensis

(1996) Siffullah & Thomas

... *Meloidogyne javanica*

:

) (Yedidia *et al.*, 1999)
) (
(*T. harzianum* Bi
M. javanica
)
::
(

M. javanica
M. javanica
(Root- dip)
()
(Early urbana)
)
(
Hussay & Barker
(1973)
Trichoderma harzianum
(Sahebani *et al.*, 2006)
:
T. harzianum Bi
M. javanica
PDA
()
:
T. harzianum
M. javanica
)
(

(Sahebani *et al.*, 2006)

(/) :

()

(Mohammadi *et al.*, 2002; Sahebani *et al.*, 2006)

(Total protein)

(1976) Bradford

SAS

(G250)

(W/V)

)

)

(

(

)

::

(

nm

)

(BSA)

(Merck

(Root- dip)

pH

(

)

)

(

(Mohammadi *et al.*, 2002;

.Sahebani *et al.*, 2006)

... *Meloidogyne javanica*

:

)

POX

(

/ pH

H₂O₂

/ pH

nm

(Zacheo *et al.*, 1995;

(KCN)

.Mohammadi *et al.*, 2002)

.(Mohammadi *et al.*, 2002; Sahebani *et al.*, 2006)

(Lammeli, 1970)

(Native electrophoresis)

M. javanica

T. harzianum

.(Mohammadi *et al.*, 2002)

/ :

/

pH

.()

/

.(Mohammadi *et al.*, 2002)

T. harzianum

/ :

/

/ pH

.()

POX

/

/

/

.(Zacheo *et al.*, 1995; Mohammadi *et al.*, 2002)

(

)

:

.()

(C₁)

()

(B) +

()
()

R_f

(C₂)

()

(A)

R_f

M. javanica

T. harzianum

*

a	a	b	b	c	c	c	
a	a	b	b	c	c	c	
/ a	/ a	/ ab	/ b	/ c	/ c	/ c	()
/ a	/ a	/ ab	/ ab	/ b	/ ab	/ ab	()
/ a	/ a	/ b	/ b	/ c	/ c	/ c	()

*

T. harzianum

(λ_{max}/min/mg protein)

/ a	/ a	a	/ c	/ c	/ d	/ d	/ d	/ bc	/ ab
a	/ a	/ a	/ a	/ a	/ a	/ a	a	a	/ a

*

*

T. harzianum

(λ_{max}/min/mg protein)

M. javanica

/ a	/ b	/ d	e	/ f	/ d	/ c	/ c	/ b	/ b	+
/ a	/ a	/ b	/ c	/ d	de	/ f	/ ef	/ d	/ ab	*

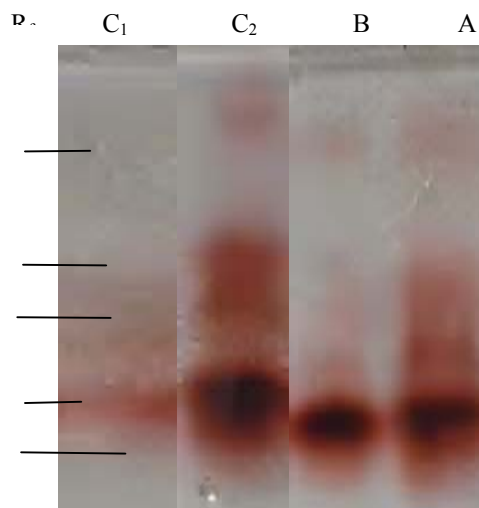
*

*

... *Meloidogyne javanica*

:

T. harzianum
()
(Sharon *et al.*, 2001)
T. harzianum



(2006) Sahebani *et al.*

T. harzianum

:C1
:C2
:B
:A

d

/

T. harzianum

T. harzianum

M. javanica

(f

)
/

(2001) Sharon *et al.* (1989) Windham *et al.*
(2006) Sahebani *et al.*

T. harzianum

M. javanica

(2001) Sharon *et al.* (Sharon *et al.*, 2001)

P₂,WT,T-203

(Williamson & Hussay, 1996)

M. javanica

T. harzianum T-203

+

$R_f = 41 \quad R_f=35$

() $R_f= 52$

(Howell, 2003)

(1999) Yedidia *et al.*
T. harzianum

.(Silva *et al.*, 2004)

()

()

.Brants *et al*

(Zacheo, 1993) (2000)

T. harzianum

(Howell, 2003)

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