

()

(*Citrus nobilis* × *Citrus deliciosa*)

*
" "
(NRL)
(I.A.R.I.)
(// : // :)

Glomus manihotis, *Gigaspora gigantean*, *Glomus mosseae*

Gigaspora Glomus

DNA VAGIGA VAGLO VANS1, NS21, NS61

Glomus

VAGLO

VANS1

G. manihotis *G. mosseae*

() *G. gigantean*

VANS1-NS61

rRNA

() PCR DNA

DNA VANS1-VAGIGA VANS1-VAGLO

(AMF)

AMF

(Usha *et al.*,

AMF (Fortuna *et al.*, 1996) 2004
(Helgason *et al.*, 1999; Turnau *et al.*,
.2001) (Cruz *et al.*, 2000) (Menge *et al.*,1980)
(Sonawane *et al.*, (Declerck *et al.*,1995)
() AMF . 1998)

(Lopez-Aguilion & Mosse, 1987; (Merryweather &
.Di Bonito *et al.*, 1995; Van Tuinen *et al.*, 1998) Fitter, 1998)
(1995) Di Bonito *et al.*
Glomus intraradices (Sakamoto *et al.*, 2004)

VANS1- NS21 AMF
. PCR (Wyss & Bonfonte, 1993; Millner *et al.*,1998;
DNA Schubler *et al.*, 2001)
AMF

PCR (1997) Edwards *et al.*
Glomus mosseae
(2002) Oba *et al.* .
PCR- RFLP .(Clapp *et al.*, 1995; Redecker *et al.*, 2003)

Gigaspora
Scutellospora cerradensis margarita
. 18sRNA / kbp . rRNA
VANS1 (PCR)
NS1 AMF

AMF .(Redecker, 2000)
Glomus mosseae Glomus manihotis
Gigaspora gigantean
. DNA (1992) Simon *et al.*
PCR

AMF
(I.A.R.I) PCR
(Redecker *et al.*, RFLP
.1997; Vandenkoornhuyse *et al.*, 2002)

(1995) Di Bonito *et al.* :
 CTAB :T₀
 ()
 DNA *G. manihotis* + :T₁
 AMF *G. gigantean* + :T₂
G. mosseae + :T₃
 T₃+T₂+T₁ + :T₄
 m1 m1
 EDTA (14ml) NaCl 5M (g) CTAB 2%]
 (5ml) Tris-HCl 1M (5ml) 0.5 M, pH 8.0
 [(26ml)
 (: :)
 rpm (°C)
 / /
 °C
 rpm °C
 % DNA mM
 DNA TE μl
 (Phillips & Hayman,
 (Jalil & Domsch, 1975)
 1970)
 DNA
 AMF
 PCR
 DNA
Gigaspora Glomus
 (Simon *et al.*, 1993)
 DNA CTAB

(T₄ T₀) (PCR)

(Annealing temperature) DNA

VANS1- NS61 : (Reaction mixture)

20mM Tris-HCl) (Master mixture)

Glomus Gigaspora rRNA 0.02% /3mM MgCl₂/100 mM KCl/[pH 8.4]

(1kb) 1.25 U of *Taq* /200 mM [each] nucleotide/gelatin

VANS1- NS21 (50 DNA polymerase

550 bp (Template DNA) DNA μl

Glomales μl

(°C) (CR-CORBETT RESEARCH model CGI- PCR

PCR 960)

VANS1-VAGLO °C) (Denaturation)

Glomus (°C) (°C

(*G. manihotis*) T₁ (°C)

() bp % PCR

Glomus TAE

bp 0.1 mgL⁻¹

(Simon *et al.*,1993) (Uvidoc

model BTS-20.M)

VANS1-VAGLO

DNA

°C

G. mosseae ()

() bp)

Glomus () *G. mosseae* () *G. manihotis*

VANS1-VAGIGA () *G. gigantean*

Gigaspora ()

) T₂ T₄ DNA DNA

G. gigantean CTAB

(°C

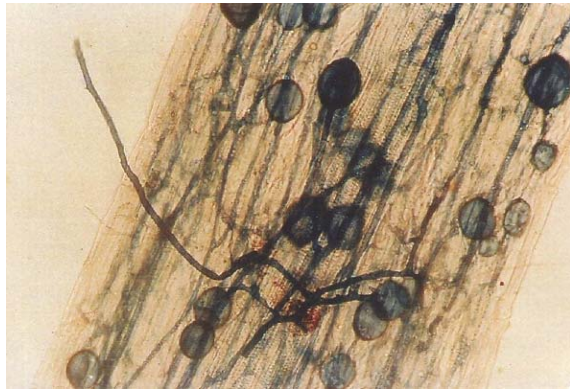
DNA

... :
 VANS1
 (/ °C) NS61 (/ °C)
 AMF T₄ DNA
 AMF °C 1kb
 rRNA
 DNA
 PCR (°C)
 Glomus VAGLO)
 VANS1 DNA ()
 VANS1-NS21
G. mosseae *G. manihotis* bp
 bp
 .()
 .(Simon *et al.*, 1993)
G. gigantean (1kb) (T₄)
 DNA
 Glomus Glomus
 VANS1-VAGIGA bp
 Simon *et al.* DNA VANS1- VAGIGA
 (1993)
G. gigantean
 VANS1-NS61
Glomus Gigaspora rRNA
 kb
 DNA
 () PCR (Morton *et al.*,1993)
 VANS1-VAGLO
 VANS1-VAGIGA .(Frey *et al.*, 1995)
 VANS1-NS21 AMF AMF
 Simon *et al.* AMF
 bp AMF

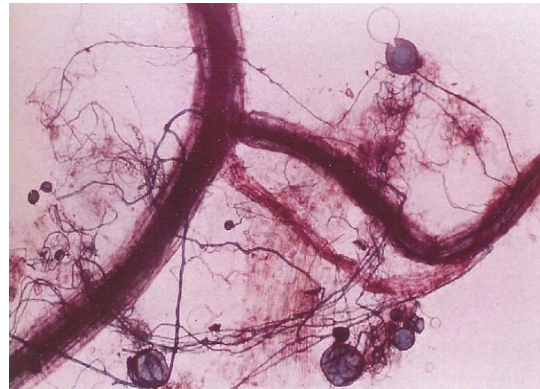
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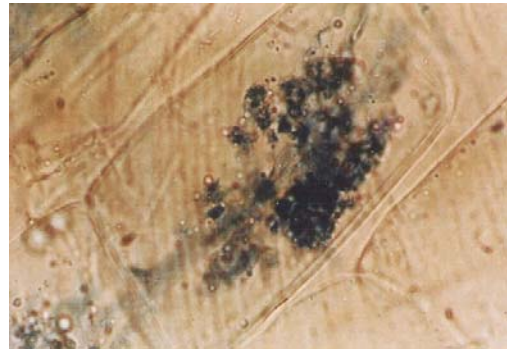
G. manihotis
(x)



(x) *G. manihotis*

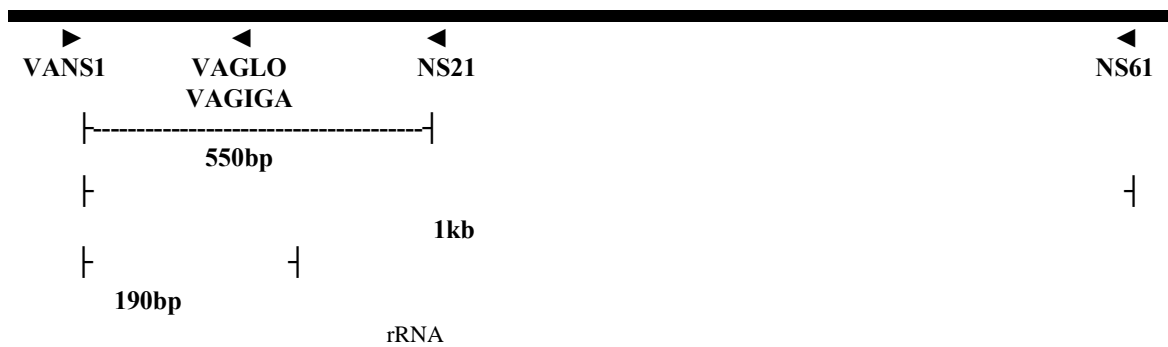


G. gigantean
(x)



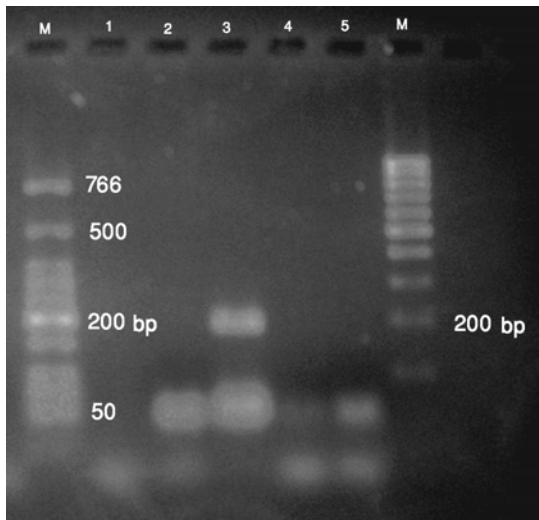
(x) *G. mosseae*

Primer	Sequence
VANS1	5' GTC TAG TAT AAT CGT TAT ACA GG 3'
NS61	5' TCA GTG TAG CGC GCG TGC GGC 3'
NS21	5' AAT ATA CGC TAT TGG AGC TGG 3'
VAGLO	5' CAA GGG AAT CGG TTG CCC GAT 3'
VAGIGA	5' TCA CCA AGG GAA ACC CGA AGG 3'



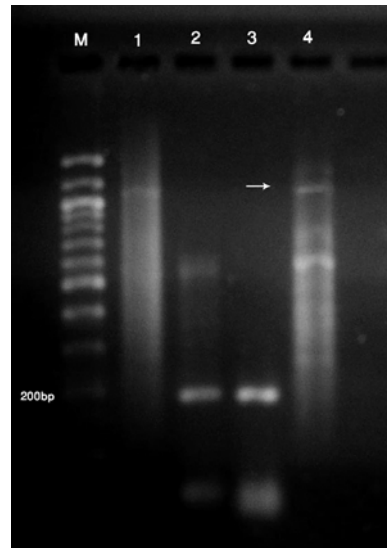
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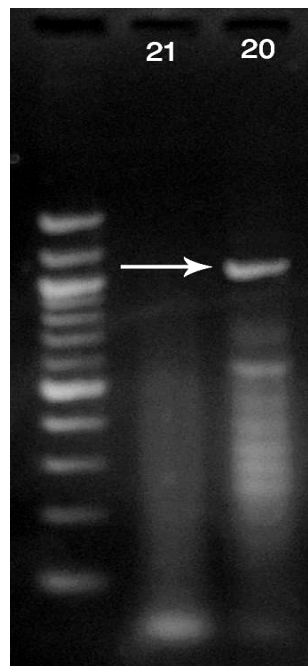
T4 T0 PCR
VANS1-VAGLO

T3: T2: T1:
DNA:M T0: T4:

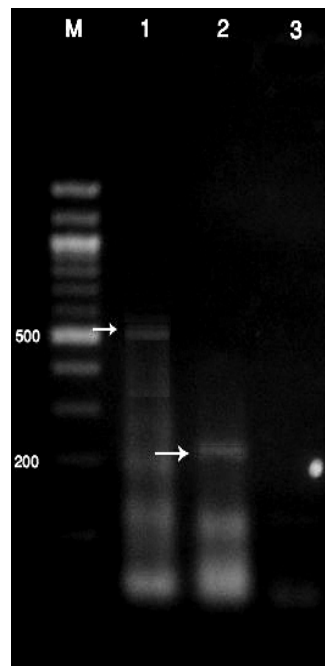


T4 T0 PCR

VANS1-NS61 T0:
VANS1-VAGLO T1:
VANS1-VAGLO T3:
VANS1-NS61 T4:



VANS1-NS61
kb
PCR
VANS1-VAGLO () VANS1-NS21 DNA
() VANS1-VAGIGA ()



T4 PCR :
()
PCR :